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# **Notebook technology – an Information Communication Technology innovation in action**

**A case study of notebook computer  
enhanced education at a boys  
independent secondary school  
in New Zealand**

**By**

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# Abstract

The use of notebook computers within educational institutions has been a relatively recent innovation. There is only limited research into the impact of this Information Communication Technology (ICT) innovation within secondary schools, particularly within the New Zealand context. The implementation of a school wide notebook programme at a New Zealand secondary school has been the setting for this research. After completing a comprehensive literature review, a two phase case study research approach was used employing both quantitative and qualitative data collection.

This study investigates the perceptions of the three key stakeholder groups, staff, students and parents, who participated in a notebook enhanced teaching and learning environment. Written surveys were conducted with samples of each of the different stakeholder groups. Areas such as participant attitudes, preferences and ICT utilisation were investigated. Possible differences attributable to student academic ability were also considered. These surveys were followed by focus group discussions with two groups of staff and also a student group. The data was analysed and examined in the context of previous related ICT research and specifically with reference to other portable computer studies in the field of education.

The findings suggest that the notebook programme has, in general, had a limited impact on the teaching and learning at the school. However for some individuals ubiquitous notebook usage has been a positive experience, while for others it has been a negative experience. In general participant perceptions were diverse and for the most part reflected their own experience within a notebook enhanced learning environment. There is a complex interaction between a number of variables, some of which appear to be beyond the control and influence of the participants. These issues include: staff and student ICT literacy and motivation, appropriate classroom usage of the technology, opportunities and support for staff professional development, notebook computer reliability and functionality.

The findings from this study have the potential to assist those in educational institutions considering or currently involved in similar notebook enhanced programmes. In

addition the research has provided the particular school with an in depth case study of the recently implemented notebook programme at the Year 9 level.

The study presents a series of possible recommendations and avenues for further research. It highlights the key factors and barriers to an effective student notebook programme. The findings of the research suggest that the notebook programme was generally considered a worthwhile and effective innovation within the unique setting of the school environment investigated.

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## Candidate's Statement

I declare that this thesis is the result of my own work, except where due acknowledgement has been made. It has not been submitted, in part or in full, at this University or to any other institution for a degree, diploma or other qualification

A handwritten signature in black ink, appearing to read 'Duncan McQueen', with a long horizontal flourish extending to the right.

Duncan McQueen

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## List of Abbreviations

- AAL** 'Anytime, Anywhere Learning' programme initiated by Microsoft Corporation and Toshiba America Information Systems.
- ACOT** 'Apple Classrooms Of Tomorrow' programme initiated by Apple Computers Inc.
- ERO** Education Review Office
- ICT** Information Communication Technology
- ILS** Integrated Learning System
- IT** Information Technology
- ITAG** Information Technology Advisory Group (New Zealand)
- HOD** Head of Department
- MOE** Ministry of Education
- NCEI** New Classroom Environment Instrument, designed by Newhouse (2001)
- NCEA** National Certificate of Educational Achievement
- SKC** Saint Kentigern College
- SNAP** Student Notebook Access Plan

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# Chapter 1

## Introduction

### **The significance of ICT and notebook technology in 21<sup>st</sup> century education**

There is both an increasing emphasis on and a growing appreciation of the importance of Information Communication Technology (ICT) within the educational context. This is in part reflected in the international focus on the increasing use of notebook technology in education. For example, in *Time* magazine an article was speculatively entitled 'A Laptop for every kid – More schools are convinced they're worth the cost' (*Time*, May 1 2000 : 37). Is this drive for smaller and faster technology a sign of what is to become the 'norm' for educational institutions in the new millennium? In 2000, in the United States, the Governor of Maine proposed a funding programme whereby all seventh grade students in the state would receive the use of a notebook computer (Stager, 2000). Recently, in June 2001 a New Zealand government initiative was launched as part of the Digital Opportunities programme, with the establishment of the Notebook Valley project. This project centred on four Hutt Valley State schools, which were provided with notebook technology for staff and students (Te Kete Ipurangi, 2002). Currently a number of New Zealand independent schools have operational student notebook programmes, as do many other institutions overseas and clearly it would appear that the use of notebook technology within education is set to increase in the coming decade.

The study of the effect and impact of notebook computers in education is a relatively new field of research and as such independent rigorous and trustworthy published research reports are scarce. In New Zealand Halliday made the observation that 'there has been little in-depth investigation into student use of computers' (2000 : 29). The present study may add to the steadily increasing body of information pertaining to notebook enhanced learning within secondary schools. Whether there is any significant benefit in terms of academic performance of using notebook technology in the classroom has yet to be clearly demonstrated. However one has to question how such a correlation could possibly be demonstrated given the unique complexities of school life

and the many variables involved in the education and more importantly the learning styles of students (Lai, 1992). Thus, this is an exploratory study which seeks to understand the 'conditions' of notebook use in schools rather than an attempt to show the 'effects' of learning with technology alone.

As Blackburn suggests, 'there is very little documented evidence proving that the use of computers in schools actually improves the learning ability of students' (1999 : 26). However this begs the question as to why should we expect technology alone to improve learning? It will be the evolution of a new educational philosophy that assimilates the functionality of the technology available in such a way as to enhance student development and understanding that will ultimately bring about further improvements in teaching and learning.

This study of a student notebook computer programme will aim to tell a story; it seeks to observe, describe and understand the use of notebook computers within a 'bounded system' (Stake, 1980) of one New Zealand secondary school. This research alone can not resolve the potential issues and concerns raised regarding the use of notebook computers in the classroom. It aims to add to the knowledge base and understanding of this form of ICT innovation within the context of a New Zealand educational institution. In this regard it hopes to make a valuable contribution to future ICT programme developments with respect to the use of notebook technology within the classroom learning environment. Indeed, in the context of student notebook programmes, it has been stated that 'identifying what is happening and the successes that are emerging will be vital if parent support and the support of others is to be maintained' (Passey, et al., 1999a : 105).

### **Background to the study**

In 2000, Saint Kentigern College (SKC) witnessed the introduction of a fully integrated notebook enhanced learning programme for Year 9 students (Form 3). Prior to 2000, participation in the student notebook programme had been voluntary. During the past five years the College, in partnership with Toshiba New Zealand, has introduced the Student Notebook Access Plan (SNAP). SKC has the expressed goal of having all students utilising notebook technology as a tool in their classroom studies by 2003. The

infusion of notebook technology within a strong existing curriculum has been the prime objective of the college notebook programme. As the SKC website (2001) states:

*ICT is a curriculum tool. It will be, where appropriate, used to enhance and facilitate student learning and to create learning opportunities that otherwise may not be possible. This will ensure that our students are equipped to meet the demands of the workplace in the 21<sup>st</sup> century.*

SKC is one of the leading schools in introducing this ICT innovation and has taken an active role in the promotion and development of New Zealand based notebook computer programmes. In past years at the Toshiba sponsored 'Expanding Horizons' conferences, both in Auckland (2000) and in Christchurch (2001), a significant number of the workshop sessions have been led by members of the College staff. Given the unique high profile position of the College within the community, and its role in leading the introduction of notebook technology within the classroom, SKC is ideally suited as the context for this study.

The belief that the student notebook programme is worthwhile is not sufficient and rigorous evaluation is required to establish if the notebook programme has had the desired impact and has enhanced the learning opportunities afforded at the College. We know that in the past many schools and school systems appear to have given relatively little consideration to how computers are utilised once they have them in place (Schofield, 1995). As Mumtaz (2000) states:

*Even if teachers are provided with up-to-date technology and supportive networks, they may not be enthusiastic enough to use it in the classroom. Teachers need to be given the evidence that ICT can make their lessons more interesting, easier, more fun for them and their pupils, more enjoyable and more motivating (2000 : 338).*

There is a strong case as Willis, Thompson and Sadera (1999) have argued, for more systematic case studies that document the way innovations in the use of technology have been implemented. Thus with this in mind, this thesis will provide further brush

strokes in the portrayal of the use and integration of ICT in schooling in the new millennium.

### **The researcher's perspective**

At the commencement of this study, the researcher was the Dean of Year 9 (Form 3) and had the responsibility for the overall academic programme of this group of 200 students. This gave the author regular contact with students, fellow staff members and parents, some of who were unfamiliar with the College notebook programme. The researcher is a committed notebook teacher and the majority of his teaching groups (Year 9 – 11) in 2001 were notebook classes and the study takes place within this setting.

For obvious reasons the researcher was keen to study this significant innovative educational development at the College. Unlike other studies this dual role provides a unique 'insiders' view on a student notebook programme. This is considered a strength of the current research study, as this position offers a deeper and richer understanding of the context and culture of a notebook programme.

### **Structure of the thesis**

This thesis commences with a description of the literature relevant to the study in Chapter Two. In this chapter, a critique of the relevant ICT literature, together with the researcher's own experience of teaching within a notebook enhanced learning environment, leads to the development of the research objectives. Chapter Three provides a detailed account of the case study methodology undertaken, while Chapter Four reports the data. Interpretation and discussion of data and comparison with other studies is completed in Chapter Five. Chapter Six outlines a general discussion of notebook related issues, together with a critical evaluation of this research leading to questions and issues for further research. Finally, Chapter Seven concludes with a summary of the study, together with a series of recommendations for the future.