

Are Schools Ready to Go Online? A Case Study of Ten Secondary Schools in the Sydney Metropolitan Area

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INTRODUCTION

Much has been written and said about the use of technology to engage students in the learning process. This research is founded on the premise that technology in a school environment is more than just the number of computers in a classroom. According to a recent British Education report (Dfes, 2004), students are manipulating technology and information with dexterity that is not adequately catered for. This research explores the current impact that computer technology has on learning in a secondary school context by examining student and teacher perceptions about the use of computer technology in secondary school including the use of the Internet. The research also collects data about the skill and usage patterns of students and teachers in the use of computers, computer applications and the Internet. The research links these perceptions and usage data to the online presence of each school and examines from 2004 to 2006 the development of learning material posted on the school web pages.

RESEARCH DESIGN AND QUESTIONS

The research design needed to capture the school setting with the various realities of students, teachers and principals. The adoption of a case study approach, utilising quantitative and qualitative methods, provides the necessary liaison between the individual elements as well as capturing the substance of the research. The inclusion of a quantitative analysis allows the researcher to develop a richer understanding of the complexities between student and teacher perceptions, the impact of technological development and the implications for an online presence. The quantitative analysis provides robustness to the results collected from the surveys administered to students and teachers in the survey schools. The analysis is also used to develop a scale of online use. The qualitative analysis provides contextual information as well as a level of perspicuity to the quantitative analysis.

The questions underpinning this research needed to capture school practice, with its underlying pedagogy and individual rationales, along with technical data and use patterns. The eight specific questions that are addressed by this research design are listed below:

1. What is the relationship between teachers' computer skills and the integration of computer technologies into education programs?
2. What infrastructure has been established at schools to assist teachers in (a) increasing their information technology skills and (b) integrating technology into their teaching?
3. If the school has an infrastructure of networked computers, (a) what influences were responsible for its establishment and (b) what goals were serviced by establishing that infrastructure.
4. Does student age or gender have any relation to (a) their level of computer skill or (b) their interest in using computers?
5. Is there a perception amongst (a) students or (b) teachers that computer based programs will improve student achievement and is this view consistent across all schools whether it be single sex, co-educational or lower secondary?
6. What impact, if any, do students perceive that online learning can have on their education?
7. Is there any evidence of an on-line delivery of educational services in schools or a movement towards one?
8. Do schools or the participants surveyed see any advantage in adopting a greater stake in the use of computer technologies in the learning process?

The information needed to provide answers to these questions was gleaned from two questionnaires, one each for the students and teachers, and interviews with the Principals of the participating schools.

METHODOLOGY

Students in two particular year levels and teachers in the ten secondary schools were surveyed. Overall 2023 student and 243 teacher responses were received. Nine principals agreed to be interviewed and the web sites for each school were accessed and evaluated for their learning content for the period 2005 to 2006.

From the student and teacher data, after a factor analysis, six specific scales were formed: computer use, computer application, relevance, positive learning, online readiness and online usefulness. Online readiness and online usefulness were identified as the two dependent variables. In order to evaluate the impact of the dependent variables a linear regression analysis was applied. The linear regression also assisted in curbing the other variables.

The qualitative data from the interviews with principals served two purposes. The principal's specific knowledge of the school operating model was able to add a complementary layer of understanding to the quantitative data for each school. Secondly the principals provided an insight into the particular school's rationale and direction for learning and technology development.

Connecting the six scales to the school's web presence required the learning material on each page to be analysed and an eFactor be calculated. Various models of eLearning exist that do discriminate between the amount of physical presence as well as web interactivity. However the models did not adequately distinguish between the learning purposes of each posting. Using a model developed by the Organisation for Economic Co-operation and Development (OECD, 2005) as a foundation, existing constructs of eLearning were modified and adapted to this particular research. Six constructs of eLearning were defined; supplementary administration, supplementary augmented, supplementary directed, supplementary formative, dependent and mixed modal. Each of the constructs was categorised and weighted according to the following criteria:

- **Learning**
 - **Linked:** A hyperlink or directive to a website or hardcopy material.
 - **Encased:** Structured or staged work usually comprised of a variety of materials and stimuli. This material would be able to replace instructional time in the classroom.
- **Context**
 - **Related:** Material for use by students at their discretion
 - **Additional:** Further pertinent material for the students to use or investigate at their discretion due to the lack of accompanying instruction.
 - **Essential:** Accompanying instruction renders this material a necessary part of the learning sequence and requires the student to interact with the material.
- **Formal Interaction:** Addresses the flow of material that has been documented for each posting. Where there is a lack of documentation, a one way flow has been assumed.

The web presence of each school was then scored according to the categories of the postings, see table 1, school size and the number of teachers posting material.

Table 1. Categorisation of e-learning constructs

Categories	Learning	Context	Formal Interaction
Administration		Related	One Way
Augmented	Linked	Related	One Way
Directed	Linked	Essential	One Way
Formative	Encased	Additional	One Way
Dependent	Encased	Essential	Two Way
Variable	Encased	Essential	Multi

RESULTS

The study provides descriptive data about the access to computers away from school for students and the number of home computers that are connected to the Internet. This dispelled some notions that there were not enough students with computers at home with Internet connections. It also augments available data about student computer use patterns away from and at school, showing that year rather than gender influences the use of some computer applications. The study provides data about the level of a teacher’s computer skills and the influence of gender, years of experience and subject background on the data. The study also provides a teacher opinion rating on the use of computer applications as they apply to learning.

This understanding is then matched by the regression analysis to the ways that computers are used at school by teachers. The regression analysis shows the levels of operation and understanding between students and teachers and that

the students and teachers are clearly operating from different levels. The teacher linear regression variance for Online Readiness and Online Usefulness was $R^2=0.199$ and $R^2=0.144$ respectively whereas for students’ the linear regression variance for Online Readiness and Online Usefulness was $R^2=0.18$ and $R^2=0.36$. Teachers are waiting to be ready for online use, model 1, whereas the students are past being ready, model 2.

The web site analysis provided some confirmation of the regression analysis as well as giving some insight to the progression by teachers in their use of school website in the following year. The resultant eFactor for the ten schools placed the schools in three distinct groups. The schools in the top category were distinctive not only by the number and interactivity of each posting but the underlying technology philosophy of the school principal. This was despite some of the schools focusing on the technical skills of the teacher and underpinning those skills as part of a total school program.

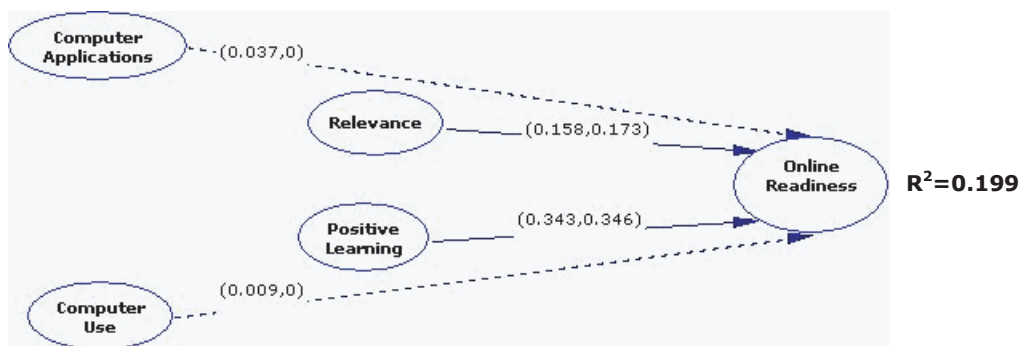
Finally the case study provides an overall perspective as to the understanding by individual leaders as well as educational systems of their commitment to and understanding of technology integration with the learning process. Clear evidence exists to demonstrate that school leaders who have a sound understanding of the benefits of technology coupled with an inspirational learning vision have instituted appropriate school development.

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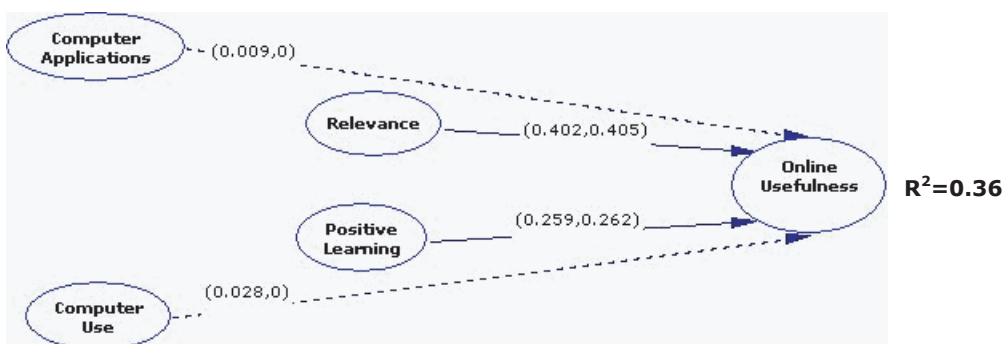
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Model 1. Linear relationship showing the teacher relationship between the variables of online readiness, relevance and positive learning



Model 2. Linear relationship showing the student relationship between the variables of online usefulness, relevance and positive learning



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