Improving Students' ICT Use:
The LDCT at Burleigh Heads State School

Glenn Finger

School of Education and Professional Studies
Gold Coast Campus, Griffith University

Nigel Baker, Debbie Nagel, Kerry Rarere

Burleigh Heads State School

Learning and Development Centres – Learning Technology (LDCT's) have been established by Education Queensland to enhance the professional development of teachers in integrating information and communications technologies (ICT) in their curriculum programs. This paper, following an articulation of the principles underpinning the operation of the LDCT's, reports research findings obtained from an investigation of student outcomes of Year 5, 6 and Year 7 students at the LDCT established at Burleigh Heads State School. A framework of the ways in which ICT might be used in student learning was conceptualised in terms of two categories – Learning for Areas and Learning through Areas. Within those major organising categories, additional areas, which informed those categories, were identified to create a Learning for Technology Student Rubric and a Learning through Technology Student Rubric. Data were obtained through the use of those rubrics as well as through interviews with teachers and students. The improved use of ICT by students is reported.

Introduction

During the last 20 years school education systems throughout Australia have formulated and embarked upon a range of policies and initiatives aimed at enhancing student learning through the integration of information and communication technologies (ICTs). As summarised in the recently published report *Making Better Connections: Models of Teacher Professional Development for the Integration of Information and Communication Technology into Classroom Practice* (DEST 2001) are the defined goals, collaboratively developed by Australian education systems (see DEST 2001, p.11; DETYA 2000), which focus on students and schools using ICTs. Similarly, the MCEETYA Information and Communication Technologies in Schools Taskforce, which was established in July 2001, within its terms of reference, aims to provide leadership to the Australian education community in the effective use of ICTs (MCEETYA 2002).

Within the context of heightened systemic ICT initiatives throughout the Australian States and Territories, Education Queensland has commenced Education and Training Reforms for the Future (ETRF) (The State of Queensland 2002) with *ICTs for Learning* projects. ICTs are one of the three major components of the ETRF with the Queensland Government committing $23 million in addition to the existing $36.4 funding for 2002–

2003 and a further $35 million will be made available in 2003–2004 to improve ICT access and ICT skills of students and teachers (The State of Queensland 2002, p.4). Eight systemic projects to support ICT's for Learning are outlined (The State of Queensland 2002, pp.34–37) - School ICT Profile Project, Performance Measures Project, Systemic ICT Procurement and Service Delivery Project, ICT Support Project, Online Examples of ICT Curriculum Integration, Community Access to ICTs in Schools, Learning and Development Centres (Learning Technology), and The Learning Place. This paper focuses on an investigation of student outcomes of Year 5, 6, and Year 7 students at the LDCT, which is one of those eight initiatives, established at Burleigh Heads State School.

The LDCT at Burleigh Heads State School

The LDCT was established at Burleigh Heads State School during 2000 by Education Queensland to "provide localised and sustainable professional learning opportunities for teachers through the delivery of programs that are designed to meet the needs of the teachers" (Education Queensland 2001). The LDCT's, which are located in school settings, provide face-to-face sessions for teachers that include exemplars of classroom practice (Education Queensland 2001). This paper provides insights into the use of ICTs by students in Years 5, 6 and 7 at the Burleigh Heads State School LDCT throughout 2001. In establishing the LDCT, additional resources were acquired including an additional computer room to accommodate the Practicum participants to be invited from other schools, the provision of additional ICT resources for the teachers and the classrooms involved in the project, and a Coordinator for the LDCT was appointed with key roles in planning and conducting the practicums and liaising with classes at Burleigh Heads State School (Finger et al 2002, p.3).

Through the establishment of the LDCT at Burleigh Heads State School the computer to student ratio in Years 5, 6 and 7 increased from one computer for every 5.4 students to one computer for every 3.6 students.

Data collection and the development of the mapping instrument

At the commencement of the 2001 school year, it was decided a research project would be undertaken with the students and teachers of the Years 5, 6 and 7 classes to map the ICT use by students and use this as a measure of the extent to which their teachers had integrated the use of ICT in their curriculum programs. While numerous studies were examined in a search for instruments to use in the mapping process, the work by Atkin (1997), in her use of two major categories - *Learning For Areas* and *Learning Through Areas*, was referred to after a conceptual framework of the ways in which ICT might be used in student learning was developed using Inspiration software by the Coordinator with key teachers. Within those major organising categories, additional areas which informed those categories were identified to create a *Learning For Technology Student Rubric and a Learning Through Technology Student Rubric* (see Finger et al 2002, pp.4–5). The rubrics were administered to each student in Years 5, 6 and 7 in March/ April 2001 and the process was repeated in November 2001, to enable comparisons of the two sets of data.

In addition to the administration of the student rubrics, data were collected through interviews with two focus students, two focus teachers involved in the LDCT, and the

114

LDCT Coordinator. This paper also refers to relevant aspects of *Student Satisfaction Survey* data gained by Education Queensland as part of its performance measurement processes.

Results

The student rubrics – A summary

As displayed in Table 1 below, overall increases in the use of ICT in *Learning for Technology* were reported by Year 5 students (22.76%), Year 6 students (30.41%) and by Year 7 students (10.91%). Similarly, overall increases in the use of ICT for *Learning Through Technology* were reported by Year 5 students (14.03%), Year 6 students (28.27%) and by Year 7 students (14.46%).

Table 1

Mapping the use of ICT by year 5, 6 and 7 students

YEAR LEVEL	LEARNING FOR TECHNOLOGY AREAS (APRIL/MAY 2001)	LEARNING FOR TECHNOLOGY AREAS (NOV. 2001)	OVERALL INCREASE (DECREASE) FROM APRIL/MAY UNTIL NOV.	LEARNING THROUGH TECHNOLOGY AREAS (APRIL/MAY 2001)	LEARNING THROUGH TECHNOLOGY AREAS (NOV. 2001)	OVERALL INCREASE (DECREASE) FROM APRIL/MAY UNTIL NOV.
5	38.88%	61.64%	22.76%	44.56%	58.59%	14.03%
6	42.25%	72.66%	30.41%	40.78%	69.05%	28.27%
7	54.39%	65.30%	10.91%	48.81%	63.27%	14.46%

More specific data analysis of dimensions contained in the rubrics and reported elsewhere (see Finger et al 2002, pp.5–10) generally showed substantial increases in ICT use by students. For example, after approximately 6 months of being immersed in the enhanced ICT integration environment in their classrooms, strong use of ICT was reported by Year 5, 6 and 7 students in their being comfortable in using ICT, in identifying the purpose for using ICT, being confident when faced with a new situation when using ICT, choosing to use ICT to help them do their work, using ICT by themselves, using ICT when accessing information, and for applying previous knowledge of using software. However, while improved levels of use of ICT for communication purposes occurred, this use of ICT remained lower relative to other dimensions of ICT use by students.

Focus students – Mapping ICT use and student perspectives

Two focus students were interviewed in November and their individual profiles were mapped (see Table 2 below) using the student rubrics to further illuminate student use of ICT and to further illustrate the usefulness of the rubrics. The students are referred to as JA and CR respectively. JA is a female, Year 6 student who is considered a very good student by her teacher, had used computers 'a lot', and had only used the Internet 'a little', while CR is also a female Year 6 student who is receiving learning support, and had little or no background to using computers prior to her involvement in the enhanced ICT provisions afforded by the LDCT.

Table 2

Mapping the progress of the use of ICT for JA and CR

Learning for Technology

LEARNING FOR AREAS	BIT	BYTE	KILOBYTE	MEGABYTE	GIGABYTE
Skills					
Accessing Information	JA* CR*			**CR****	**JA****
Communication	JA* CR*			**CR****	**JA****
Peer Tutoring			JA*	CR* **CR****	**JA****
Attitudes					
Comfortable With Use			JA* CR*		**CR**** **JA****
Independence		CR*		**CR****	JA* **JA****
Experiences					
Applying Previous Knowledge	CR*			**CR**** JA*	**JA****
Choosing To Use ICT		JA* CR*		**CR****	**JA****
Confidence		CR*		JA*	**CR**** **JA****
Identifying Purpose				CR*	JA* **CR**** **JA****

Learning Through Technology

LEARNING THROUGH AREAS	BIT	BYTE	KILOBYTE	MEGABYTE	GIGABYTE
Better Access to Information					
Critical Literacy		CR*		**CR**** JA*	**JA****
Enhanced Communication					
Cooperation			CR* JA* **JA****		**CR****
Global Community	CR* JA*		**CR****		**JA****
Increased Ownership					
Enhanced Care		CR*		JA*	**CR**** **JA****
Extended Depth of Presentation				CR*	**CR**** JA* **JA****
Ownership of Learning	CR*	JA*		**CR****	**JA****
Rich Experiences and Expression					
Authentic Uses			JA*	CR* **CR****	**JA****
Experience with HOTS	CR*	JA*		**CR****	**JA****
Experimentation	CR*		JA*	**CR****	**JA****
Problem Solving	CR*		JA*	**CR****	**JA****
Motivation					
Enthusiasm		JA*			CR* **CR**** **JA****
Equality				CR*	**CR**** JA* **JA****
Learning For The Future			JA*		CR* **CR**** **JA****
Peer Modeling/Respect			CR*	JA*	**CR**** **JA****

Legend: JA* - JA March/April **JA**** - JA November
CR* - CR March/April **CR**** - CR November

Follow-up interviews were conducted with JA and CR in November. Both students enthusiastically advocated their love of using the computers, their teachers, the Coordinator, other teachers and staff who interacted with them in their projects and the improved interest they had developed for school during the year. The following summary presented in Table 3 captures the major messages from the students interviewed.

Table 3

Major messages from students interviewed

KEY MESSAGES	EXAMPLES OF STUDENTS' STATEMENTS
If we hadn't been involved in this project, we wouldn't have known what we were missing out on in using ICT.	JA: *We wouldn't know any different. But now I use the computers to do so many things like for communication, reading, animations, sound, movies, CD's, and graphics. You can't do this without computers. But if you don't know, then you don't know what you don't know.*
Now that we know what ICT can be used for, if we had the computers taken away or we had to go back to 'old ways' we'd jump up and down.	CR: *If we had the computers taken away I'd be complaining to the Principal. I'd be up there straight away.* JA: *I like using the Internet and all the different software. I'd be frustrated if I had to publish something and I knew what I could, say, do with the computers and I had to use a pencil only.*
We like doing original ideas of our own. Even though we might have the same projects to do, our work is different from everybody else's.	CR: *You don't know what other people will come up with.*
Using the Internet has opened up new worlds for us.	JA: *We use the Internet for research… Internet sites… we have been looking at the Marie Celeste.* CR: *We had this ransom message about Hipi, which came by email from another country. We had to find out who had kidnapped Hipi.*
We love to share our work with other people.	JA: *It's great doing school work now as so many people get to see our work through using ICT. Before, only the teacher and I saw it and then it got thrown away.* CR: *I tell Mum all this stuff that I'm doing. She says, "Wow!" and smiles at me. Because I've had trouble learning things before, I somehow seem to love doing all these things now and telling people about it.*
We don't mind doing things out of school time… we often don't want to stop	CR: *You just get so involved. It's better than doing work…*
This is going to help us in life.	JA: *… computers are everywhere now…*

Student satisfaction data

As advised in the previous section, relevant data from Education Queensland Student Satisfaction Survey conducted with the Burleigh Heads State School students were examined. As displayed in Table 4 below, increases in student satisfaction from 2000 to 2001 were recorded in relation to satisfaction "with the computer skills you have learnt at school" and "with the way you use computers for learning at school". Those increases are consistent with the findings reported earlier gained from the student rubrics for

Learning for Technology and *Learning Through Technology*. For all three items, the means for student data from Burleigh Heads State School were higher than the 'State' and 'like schools' means. There was a decrease reported in the level of student satisfaction with "how easy it is to get a computer for learning when you need to". Given that the ratio of computers to students had improved and with a ratio of 1:3.6 access should have improved, one might speculate that student expectations for access might have risen.

Table 4

Student satisfaction survey data

RELATED ITEM ON THE SATISFACTION SURVEY	MEANS FOR 2000 DATA	MEANS FOR 2001	PERCENTAGE OF STUDENTS SATISFIED 2000	PERCENTAGE OF STUDENTS SATISFIED 2001
S112 – with the computer skills you have learnt at school?	School: 2.95 State: 2.77 Like Schools: 2.85	School: **3.12*** State: 2.84 Like Schools: 2.84	70.9%	**73.1%***
S130 – with the way you use computers for learning at school?	School: 2.97 State: 2.77 Like Schools: 2.84	School: **3.24*** State: 2.83 Like Schools: 2.82	69.8%	**79.9**%*
S163 – with how easy it is to get a computer for learning when you need to?	School: 2.66 State: 2.45 Like Schools: 2.46	School: **2.74*** State: 2.51 Like Schools: 2.45	58.9%	58%

* These school data showed an increase in levels of satisfaction recorded a year earlier.

Teacher and LDCT Coordinator perspectives

The LDCT Coordinator and two focus teachers were interviewed to examine the planned outcomes of the project, and their perceptions of major learnings and challenges. The teachers identified the following as outcomes of the project:

- Enhance independent learning of the students,

- Provide professional development for teachers within Burleigh Heads State School and from other schools,

- Provide ideas and opportunities to change the way they teach, and

- Skill the students more in the use of ICT.

    The LDCT Coordinator identified the following outcomes of the project:

- Meet the aims/planned outcomes of the LDCT with 4 main outcomes to be developed

    - an understanding of constructivist classroom practice

    - the role of educational technology in supporting effective learning and teaching

    - strategies to integrate educational technology into classroom practice

    - a range of applications of educational technology to support a student centred constructivist approach to teaching and learning,

118

- Teachers will be encouraged to consider the ways in which they might apply their practicum learnings to their own contexts and have to demonstrate this through the development of a project for implementation in their classroom/school, and/or the development of a presentation on their practicum experience, and

- People coming to the practicums will be able to see things happening in the real world… visit normal classrooms… see a range of strategies… a mix of constructivist and instructivist strategies.

The major learnings and challenges reported by the teachers were that:

- They haven't felt like they were on show,

- Continuing to develop our understanding of higher order thinking skills and critical literacy,

- Skilling the children to work in teams,

- Clientele were seen as a challenge as many children have been diagnosed as having special needs, some behaviour management problems, learning difficulties,

- The move from text materials in books to screen and multimedia, wider range of sources, and

- Teachers reported enthusiastically their observations of children going further with the software than they'd expected, using the thinking skills taught, students who often got little work done being more involved, motivation of students is higher, and improved visual literacy skills of students.

The major learnings and challenges reported by the Coordinator were that he was:

- Assisting teachers who had a poor self-image of themselves in terms of what they can do with the technology,

- Helping teachers to become 'switched on',

- Catering for all levels of teachers in the practicums,

- Conscious of the money being paid for the practicum and the accompanying accountability: e.g. approximately $840 per teacher = $150 for 3 days + $690 for 3 TRS days. That is, for a 10 teacher 3 day practicum the cost is approximately $8 400, and

- Major challenge is the follow-up and keeping in touch - as more teachers become involved there becomes more to keep in touch with.

Conclusion and suggestions for further research

In conclusion, the evidence provided in this report strongly indicates that, throughout 2001, positive outcomes have occurred for teachers and students. The instrument in the form of Student Rubrics for recording Learning for Technology and Learning through Technology was found to be effective for mapping the ICT use by students. Further research is now being conducted focussing on changed teacher practice through action research with two of the teachers at the LDCT, and an examination is being conducted

into the transfer of the teachers' practicum professional development at the LDCT to their own school settings after they have participated in the practicum. Considerable ongoing research is required to add to our knowledge about effective professional development for teachers in integrating ICTs.

References

Atkin, J 1997, 'Why use information technology?', *Apple Innovative Technology Schools Conference*, 1997.

Department of Education Training and Youth Affairs (DETYA) May 2001, 'Information and communication technology for teaching and learning', Retrieved from the World Wide Web at http://www.detya.gov.au/schools/publications/indexs.htm on 20 March 2002.

Department of Education and Science (DEST) 2001, *Making better connections: Models of teacher professional development for the integration of information and communication technology into classroom practice*, Goanna Print, Canberra. [WWW document], retrieved 6 September 2002, URL http://www.dest.gov.au/schools/publications/2002/MBC.pdf

Education Queensland 2001, *Learning and development centres,* [WWW document], retrieved 10 December 2001, URL http://education.qld.gov.au/learning_ent/ldf/ldc /ldc_overview.html

Finger, G, Baker, N, Nagel, D & Rarare, K 2002, Mapping ICT Use by Students: The Learning and Development Centre (LDCT) at Burleigh Heads State School. Paper presented at *Linking Learners Australian Computers in Education Conference*, 11–13 July 2002, Hobart, Tasmania. Available at http://www.tasite.edu.au/acec2002.

MCEETYA 2002, *Information and Communication Technologies in Schools Taskforce,* [WWW document], retrieved 26 August 2002, URL http://www.curriculum.edu.au/mceetya/taskfrce/task223.htm

The State of Queensland 2002, *Queensland the Smart State Education and Training Reforms for the Future ICTs for Learning School Information Kit 2002–2003,* [WWW document], retrieved 6 September 2002, URL http://www.education.qld.gov.au/ictsforlearning