# Together is better?
Primary students' and teachers' experiences of collaborative learning online

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2007

Acknowledgements

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1.   Introduction: The project and its context

This project undertook to research the use of an online learning environment to teach a collaborative unit involving three classes in two primary schools. Extensive documentation exists on the use of collaborative teaching and learning strategies in primary school classroom programmes. However, the use of online environments for collaborative work is a new and largely under-researched area for primary school teachers.

Learning environments promote effective learning when they include:

- social interaction;

- assistance for students in setting goals for learning;

- encouragement for students to reflect (and time for this);

- reinforcement of correct behaviour and informative feedback;

- an atmosphere that encourages risk taking;

- a focus on social competence;

- modelling of desired behaviour and practices for students;

- collaboration between teachers and students; and

- students who are fully involved (Atkin, 1999; Fullan, 2001; Hargreaves, 1994; Ryba, 1990).

These principles also apply to online learning. However, simply putting a traditional unit online for the students to work through does not make it effective. To be successful in this different environment, the structure of the unit, the activities and resources that are included, and the culture that is created all need to be thought through carefully for their effectiveness in a different medium. Atkin (1999) suggests that when students feel safe, the cognitive brain is able to engage and process. In the online environment, as in any other context for a unit of work, the learning outcomes need to drive the activities and the resources used, not the other way around.

Whenever a new teaching and learning strategy is used, teachers have to adjust to working differently, as do students. In an online environment, discussions take place at a different pace and cut across times. The work may involve gathering and processing information or resources, both online and at the library. One of the claimed advantages of using an online environment is that students can work at their own pace, review sections of work as necessary, and contribute to the discussion after having time to think and reflect on what has been said. How students (and teachers) understand what it means to work in an online environment needs to be explored and clarified (Bender, 2003; Ko & Rossen, 2001).

There is much literature on the collaborative use of online environments with secondary and tertiary students (for example, Evans, Lomax, & Morgan, 2000; Holzer, 2004; Lourdusamy, Myint, & Sipusic, 2003; Peel & Shortland, 2004; Whatley & Bell, 2003), but relatively little with primary-aged students. This project was developed to help address this gap in the research literature. Research support was provided to encourage the participating teachers to develop as critical professionals reflecting on their practice, using action research. In particular, the project was to have teachers use a "hybrid" model (mixture of online and face-to-face environments) to deliver part of their classroom teaching and learning programme and reflect on this process (Collison, Erlbaum, Haavind, & Tinkler, 2000; Draves, 2002; Ko & Rossen, 2001). We were interested in exploring any advantages of using the online learning environment as well as to discover the limitations and realities of using the system as they became apparent through the course of the action research.

2. Aims, objectives, and research questions

This section describes the nature of the project and gives its context, including the role of the South Learning Centre and a brief description of the Learning Activity Management System on which this project was based. It gives the aims and objectives of the research, describes the overall research questions, and explains how the research aligns with the principles of the Teaching and Learning Research Initiative (TLRI).

Background

This research centred on the development, implementation, and evaluation of a cross-school, collaborative unit of work in an online environment over a 10-week period. Teachers of three Years 6–7 classes in two schools worked together with a facilitator from the South Learning Centre (SLC) to develop a collaborative unit of work on the topic of vandalism, using a tool called the Learning Activity Management System (LAMS). The teachers and the facilitator used an action research methodology (Baumann & Duffy, 2001; Cohen, Manion, & Morrison, 2000; Haggarty & Postlethwaite, 2003) to investigate and reflect on their practice and draw conclusions about the use of this online collaborative tool for primary school teachers and learners.

The purpose of the project was to gain an understanding of the learning and teaching process within the LAMS interactive and collaborative learning online environment, using action research methods for participant researchers to inform their own practice (Borthwick, Jones, & Wakai, 2003; Roberts, 2004). The two schools taking part in the project are both at the low end of the decile range and saw it as a chance for two low socioeconomic schools to help bridge the digital divide through access to technology.

The SLC

The SLC was developed to serve the needs of local schools in the South Christchurch community, and in particular, to provide equality of access to the rich ICT resources provided. Developing collaborative and innovative learning opportunities is a core service of the centre and all programme development must adhere to its guiding principles of learning in authentic contexts, promoting creativity, critical thinking and informed decision making, fostering relationships, and promoting participation and contribution to society and community through learning and practical outcomes.

With these guiding principles in mind, the SLC saw the opportunity to work with two lower socioeconomic schools to undertake teaching a unit of work that utilised a learning activity management environment.

Learning Activity Management System

LAMS is an online learning environment recently developed at Macquarie University in Sydney. It has been described by some in the international e-learning research community as a "next generation" online learning environment, with an innovative approach to learning design (Dalziel, 2005).

LAMS is a freely available open source software provided by the non-profit LAMS Foundation. A separate commercial services company, LAMS International Pty Ltd, offers optional fee-based technical support and training. The LAMS website states:

> LAMS is a revolutionary new tool for designing, managing and delivering online collaborative learning activities. It provides teachers with a highly intuitive visual authoring environment for creating sequences of learning activities. These activities can include a range of individual tasks, small group work and whole class activities based on both content and collaboration (http://www.lamsinternational.com/).

The tools offer options for both synchronous and asynchronous learning. Teachers use LAMS to design sequences that can be used as:

- a one-off, stand-alone lesson or activity; or

- part of a unit of work mixing face-to-face activities with online activities (termed "blended learning" on the LAMS community website); or

- a complete online unit of work.

When a sequence is "released" the teacher can monitor progress of the individual students.

The teachers in this trial were using LAMS Version 1.0.1 and subsequent versions have been released. As of September 2005 a LAMS online community was launched for teachers, administrators, and developers of LAMS. Members can join a variety of sub-communities where they can "access the latest news about LAMS, many different discussion forums, and a repository of shared LAMS sequences" (http://lamscommunity.org/register/?return_url=%2Fdotlrn%2 Findex).

An overview of the LAMS environment and tools as used in this study is given in the section on research design and methodology.

Research aims

This research aimed to:

- identify how involvement in a collaborative online environment affects students' and teachers' experiences of learning;

- give teachers the opportunity to expand/add to the variety of teaching and learning strategies they use in their classroom programme; and

- produce recommendations for teachers on using the LAMS online environment.

Research questions

The research questions for the project were determined by the teachers and facilitators in collaboration with research mentors from CORE Education Ltd, a research centre specialising in e-learning research. The questions were:

1. How effective is the LAMS program in providing an online environment for collaborative learning experiences?

2. What is the nature of students' experience of learning in a collaborative learning online environment?

3. What are the critical success factors for students and teachers in developing and using a collaborative learning online unit of work?

4. How does involvement in a collaborative learning online environment affect teaching practice and strategies?

5. What was the contribution of the technology to the teaching and learning experience?

6. What did the teachers and students think of LAMS as an online collaborative learning tool?

The teacher researchers also had research questions for the action research studies they carried out. These questions focused on the nature of the teaching and learning that is facilitated by the online context, collaboration, classroom management strategies, student motivation, and engagement, the promotion of higher-order thinking skills, and the role of the ICT learning facilitator. These questions are given in the description of each case study given in Section 3, Research design and methodology.

Alignment with TLRI strategic priorities

Strategic value

The focus of this project was to develop a community of young learners—across schools, across time, and across socioeconomic boundaries—in an online environment, in collaboration with teachers. In doing so it included the TLRI themes of reducing inequalities, addressing diversity, understanding the processes of teaching and learning, and exploring future possibilities. Two classes from two different schools were involved in the research to truly test the collaborative nature of the project and to introduce the LAMS environment to a wider group of educators. Both asynchronous and synchronous activities were included in the unit of work to give freedom to the schools to share information and work together in a number of ways. The two schools involved are at the lower end of the socioeconomic scale (both decile 3) and diverse in their communities (inner city and suburban).

The project researched the implementation and trial of the LAMS system for specific learning outcomes related to cross-curricular (integrated curriculum) units. Classroom teachers and the ICT facilitator researched the learning effects of their own practices using the LAMS online context, and utilised action research methods (Cohen et al., 2000; Haggarty & Postlethwaite, 2003; Kemmis & McTaggart, 2000; Mills, 2003). There was a clear outcome of learning together and sharing information, for students and teachers, in a collaborative online environment. The exact content of the unit was negotiated with the teachers and was focused around a local issue common to both schools—vandalism.

Research value

There has been much research, both internationally and in New Zealand, on collaborative learning at various levels of the school sector (for example, Brown & Thomson, 2000; Holloway, 2003; Holmes, 2003; Holzer, 2004; Lourdusamy et al., 2003; Peel & Shortland, 2004; Whatley & Bell, 2003). The research project looked at what has been found out about working collaboratively and built on this knowledge by investigating how primary school students work collaboratively in an online environment, both with each other and with their teachers.

While some research has also been conducted on online collaborative learning, most of these studies have involved the secondary or tertiary sector (Chih-Hsiung & Correy, 2003; Hakkinen, 2003; Hron & Friedrich, 2003; Neo, 2003). Little research has been done on the use of online collaborative teaching and learning strategies in primary schools. We have identified this as a gap in research knowledge and believe the project goes some way to addressing this gap.

The SLC valued the opportunity of working with students, teachers, and researchers to research this collaborative online unit. By investigating the experiences of collaborative online learning of two primary teachers and their classes and assisting the teachers in researching and reflecting on

their own practices, the study was designed to reach meaningful findings that will inform subsequent practice in the effective application of online learning systems.

Practice value

Through this project the participating teachers undertook action research roles, developing their skills as researchers. This was done with the support of the research team from CORE Education Ltd to mentor the teachers through the research and reporting process. The teachers were also given the opportunity to increase their repertoire of teaching strategies/methods as a means of professional development.

The research project supported teachers' professional development by examining their use of action research and reflective practice to deepen and extend their use of diverse approaches to online teaching and learning. The research investigated an innovative medium that allowed collaborative work between schools in a way that is not easily available through other means. The intention was that the project would be of interest to practitioners and researchers alike.

This project offered the potential to build not only an online community of learners but also to strengthen the sense of community across and within the Christchurch geographic area, by bringing the community together beyond the shared unit of work. The likely impact on practice was to develop strong collaborative teacher relationships in schools that have similar learner needs and issues as well as having teachers reflect on their own practices in a more systematic way. The principals of the two schools saw the focus on a community issue, the collaborative environment, and the learning fostered within an online environment as an ideal context for developing the essential skills needed by their students while allowing teachers to expand their professional development. It also gave the students an opportunity to expand their ICT technical skills and to cover a number of the Essential Learning Skills listed in the *New Zealand Curriculum Framework*.

3. Research design and methodology

This section outlines the initial planning and overall design of the project. It describes the project team, the research participants, and the ethical issues involved. It then discusses the overall research design, the issue of collaborative versus co-operative learning, and the research methodology as two case studies. It also provides a picture of the LAMS environment and how it was used in this project.

Background

The study involved an initial research design team of the manager of the SLC and two members of the CORE Education Ltd research group. The manager of the South Learning Centre identified two schools of similar (low) decile rating that were then approached to take part in the research project. These schools:

- were experienced in using collaborative learning with other schools (through GlobalNet projects);

- had access to computers;

- supported an enquiry learning approach;

- had enthusiastic staff willing to embrace new learning; and

- had Years 6–7 classes.

The SLC already had a relationship with the two schools through the GlobalNet programmes. GlobalNet was originally a programme offered by the Christchurch City Council, in which schools were paired to share learning on a theme or topic and used Web boards as their main method of communication. The programme was later operated by SLC. In 2001–2004 GlobalNet staff facilitated online learning partnerships with the schools by linking them with buddy schools nationally and internationally. Positive staff relationships between SLC and the two schools were developed and nurtured during this time, establishing an environment of trust that allowed risk taking. The original teachers involved with the GlobalNet programmes at these schools were also involved in team teaching and ICT support for their colleagues.

Each of the principals in the project schools nominated a teacher or teachers from the senior part of their school to take part in the study. These teachers had expressed an interest in working collaboratively and in working with an online learning activity management system.

The project team

The members of the project team were:

South Learning Centre:	Pat Street (SLC manager and project co-ordinator)
	Dorothy Haywood (ICT facilitator/support)
School A:	Principal
	Jackie (classroom teacher)
	Caroline (classroom teacher)
School B:	Principal
	Anita (classroom teacher)
National Library of New Zealand:	Merilyn Smaill (local adviser)
Christchurch City Libraries Digital Library Services:	Mark Lawrence (technical projects manager)
CORE Education Ltd:	Dr Vince Ham (director, research)
	Sandra Williamson-Leadley (senior researcher)

The manager and ICT facilitator from the South Learning Centre supported the teachers to develop and implement their online unit using the LAMS program. The research group from CORE Education Ltd assisted the teachers in setting up their research plans and data collection methods, and writing up their action research.

Research participants

The participants for this research project were students from Years 6–7 classes at two full primary schools in Christchurch, three classroom teachers from the schools, and an ICT facilitator from SLC.

Ethical issues

CORE Education Ltd provided support for the development of the action research components conducted by the teachers and for the overall research project. The participant researchers discussed and developed a research plan that was submitted to CORE Education Ltd's ethical clearance procedures.

As informed consent is central to research ethics, informed consent was sought from the principals of the two participating schools, from the students, and, as they are minors, from their parents. Plain-language statements were prepared for each of these groups and consent was required before any data collection proceeded. As part of the informed consent process, the participants were asked to consent to the sharing of the research findings with a wider audience.

The raw data has been kept strictly confidential to the research team and the anonymity of participants has been assured in any publication (for example, through the use of pseudonyms).

Research design

Initial planning

All the research partners met on several occasions over July–August 2004 to develop key research questions, to design the research action plans, and to ensure the participant researchers were aware of the research process, the nature of action research, and the workload involved. The first of these meetings involved the classroom teachers, an ICT facilitator, and the SLC manager. During this meeting the SLC manager outlined the project, overviewed LAMS and what it offers, and what would be involved for the proposed research. The team also brainstormed possible learning outcomes, unit topics, and activities for these topics.

The second meeting was about action research methods. The participant researchers began to think about their research questions, data collection methods, and the time frame for the project. At the third meeting the areas of interest that the classroom teachers and facilitator had identified were discussed at length. The research questions were refined and each of the research participants identified the questions they would focus on as part of the collective project. Methods of data collection were also discussed and the collective research plan was formulated.

The three teachers collaboratively planned the unit of work and set up the sequences for students to complete online but also had the freedom to adjust the face-to-face content of their unit to suit the needs of the learners in their class.

The initial plan involved one class from each school, with an ICT facilitator available for each teacher. However, roll growth at School A meant that the ICT facilitator (Jackie) for that school became a full-time classroom teacher and her class was used for the study. Rather than a collaborative group the other class at school A became a comparative group, in which LAMs was implemented alongside a more traditional teaching approach to a unit due to access to the computers at School A being limited (case study 2).

Table 1 **Time frame for the project**

2004, Term 2	Identify classroom teachers to participate, conduct negotiations between research partners, develop and submit expression of interest to TLRI.
2004, Terms 3–4	Meetings of all research participants and partners, to develop research plans, develop some online units of work, identify learning outcomes, arrange tasks in relation to learning outcomes, and source topic materials.
	Familiarisation with LAMS software.
	Obtain ethical approval.
	Determine time frames for development and review.
2005, Term 1	Seek consent from student participants.
	Pilot data-gathering methods, online discussions, and tasks.
2005, Terms 2–3	Implement online unit with the two schools; ongoing data collection/analysis. Progress report submitted to TLRI.
2005, Term 4	Ongoing analysis of data; final writing up of project.
	Submission of research report.
2006, Terms 1–4	Dissemination of research.
	• SLC workshops for teachers of the schools in the south area of Christchurch.
	• Workshop/presentation for IDEA (Institute for Democratic Education Aotearoa New Zealand).
	• Two Christchurch City Council and Christchurch City Libraries presentations/ workshops.
	• Presentation at TUANZ conference in Christchurch for teachers.
	• Presentation/workshop for the ICT and the Arts Professional Development Project.
	• Presentation/workshop at ULearn 06 conference in Christchurch.
	• Presentation at the LAMS international conference in Sydney in December 2006.

The teachers had four meetings in Term 4, 2004, in which they were trained in the LAMS tool and wrote their research questions, with additional meetings held to scope possible themes and time frames. During Term 1, 2005, they decided on the topic and planned the unit, which was implemented in Term 2.

Collaborative or co-operative learning?

One of the key words our research team needed to have a common definition for was "collaboration". This was to ensure that when we spoke about working collaboratively, we had a shared understanding about what was meant.

Roberts (2004) states that:

> Collaborative is an adjective that implies working in a group of two or more to achieve a common goal, while respecting each individual's contribution to the whole. Collaborative learning is a learning method that uses social interaction as a means of knowledge building (p. 12).

We had an interesting discussion amongst the group about "collaboration" and "co-operation" as concepts. The term, "co-operative", seems to be used interchangeably with the term "collaborative". Our group came up with the differentiation that to work collaboratively meant to work together to achieve a common goal while working co-operatively meant that each individual contributed to the greater understanding of the whole group but did not necessarily have a common goal.

Our group was committed to wanting the students to work collaboratively in the unit, both within their own class and across the two classes. This meant looking closely at the activities and ensuring that they were set up to achieve this goal.

Crook (1996) stated that the following indicators of collaboration could be used to evidence collaboration:

- Questions asked— responses of students
- Student questions and other students' responses to those questions
- Amount of contact
- Number of interactions
- Using 'We' rather than 'I'.

These indicators were used by the teachers to identify incidents of collaboration (the core phenomenon) when students utilised the online environment. These incidents were "captured" in the LAMS sequences and printed out or saved as screen shots.

Unfortunately, due to the diversity of online and offline tasks operating within the classroom environments, what was being missed on many occasions were the incidents of collaboration happening between students face-to-face while working online. For example, School B students became extremely "excited" when they saw their own names appearing on screen when they submitted a response. This generated a face-to-face group discussion by three students as to the implication of this: e.g., "Everyone can see what I wrote" (B22); "Write what's important…" (B25); "What is important?" (B19).

Note: The coding used (letter + numbers such as B22) is to identify the students from each school whose comments are recorded and used in this report while maintaining their anonymity.

Methodology

The overall research project could broadly be categorised as three interconnected case studies. The research involved interviews with three classroom teachers in two schools and their respective Years 6–7 classes who took part in the collaborative unit of work over a 10-week period operating in an online environment.

During the initial meetings of the project team, action research methodology was discussed. This gave the teachers involved in the project an idea of what undertaking the project would mean as far as their class programme/workload was concerned, the expectations of recording/collecting data, and what writing up the research would entail.

Vandalism was an area of concern for both schools and this became a logical choice for the topic of the unit. The teachers brainstormed ideas about the learning outcomes for the students and what activities to include to achieve these outcomes. The teachers were then taken through the LAMS program and shown how to create learning activity sequences for their students. This was followed up by opportunities to create sequences for inclusion in the unit.

The teachers were then asked to consider what it was that they wanted to find out as a result of using the LAMS environment to deliver the unit on vandalism. Again as a group, they brainstormed ideas and worked with the research team from CORE Education Ltd to refine the questions. For the teachers, the research questions came under the themes of collaboration, management, motivation and engagement, and thinking. The facilitator focused on questions regarding the facilitation process and strategies used. The teacher/facilitator participants used the basic research plan to identify any specific research questions/areas they wanted to focus on during the course of their action research with their classes.

Work was also done to develop data collection methods that would fit in with the types of activities they wished to include in the vandalism unit while allowing them to collect data to assist in answering their research questions. Data collection methods included unit/lesson plans, feedback from project meetings, observations, anecdotal notes from reflective journals kept by the teachers and students, interviews with teachers and students, and samples of student contributions on LAMS sequences.

During the course of the research, the project meetings were an opportunity to discuss the data collection methods, any technical difficulties experienced, adjustments needed to the lessons of the unit, and how to analyse and utilise the data collected in terms of answering the research questions.

Case studies 1 and 2—School A

This research involved two Years 6–7 classes.

In the first class, 16 of the 22 students were Year 7 students and the remaining six were Year 6. Fourteen of the class were boys and eight were girls. The class on the whole comprised the more able Years 6 and 7 students. One boy had English as a second language.

The second class had 25 students (15 boys and 10 girls), with reading ages ranging from 5 to 15+ and one student who was dyslexic. This class became a comparative group in which LAMS was implemented alongside a more traditional teaching approach to a unit. The students had access to eight computers in the classroom next door, when available, and one computer in the class via a roster system. The students completed two LAMs sequences within the unit.

Case study 3—School B

This study involved a Year 7 class of 26 students—15 boys and 11 girls.

The data collection methods used included the teacher's personal research journal and students' reflection journals. Examples of the students' responses were printed out and analysed. The classroom teacher throughout the unit conducted observations of and informal interviews with the students that she recorded in her reflective journal.

All of the case study teachers worked as a collaborative team to plan the vandalism unit.

Figure 1 **Brainstorm of vandalism unit**

QuickTime™ and a
Graphics decompressor
are needed to see this picture.

Once they had familiarised themselves with the LAMS system, they wrote and trialled sequences. Together they planned the class sequences and negotiated times to work online. Each sequence was supported by class lessons and additional activities to provide knowledge and understanding. As the unit progressed, the teachers met at various intervals to write the next sequences and evaluate progress.

Action research questions

In order to answer the project research questions, the teachers identified specific action research questions they would focus on as part of the collective project. These questions were grouped under the headings of collaboration, management, motivation and engagement, and thinking.

Collaboration

- What do I do to foster quality collaboration between learners in the two schools in the LAMS context?

- What were the most and least effective strategies in fostering collaboration?

- Does the nature of the collaboration change over time?

- Are there particular groups for whom this collaborative environment is more effective than others, e.g., differing in gender, culture, and learning style?

Management

- What do I do to manage student access to computers so it is fair to all?

- What class management strategies were the most and least effective?

- Are there particular groups for whom these strategies are more effective than others, e.g., differing in gender, culture, and learning style?

Motivation and engagement

- What is it that is motivating/non-motivating using the LAMS environment?

- Does the nature of students' motivation/engagement change over time? Why or why not?

- Are there particular groups for whom this environment is more motivating/engaging than others, e.g., differing in gender, culture, and learning style?

Thinking

- What are the various levels of thinking (Bloom's Taxonomy) that are observable in the interactions and were these appropriate to our thinking goals?

- What are the ways in which we can foster higher-order thinking in the activities used on LAMS?

- What are the most and least effective strategies for the promotion of higher-order thinking skills?

- Are there particular groups for whom this environment is more effective than others in relation to higher-order thinking skills, e.g. differing in gender, culture, and learning style?

The LAMS screen environment

The introductory screen

Figure 2   **The introductory LAMS screen**
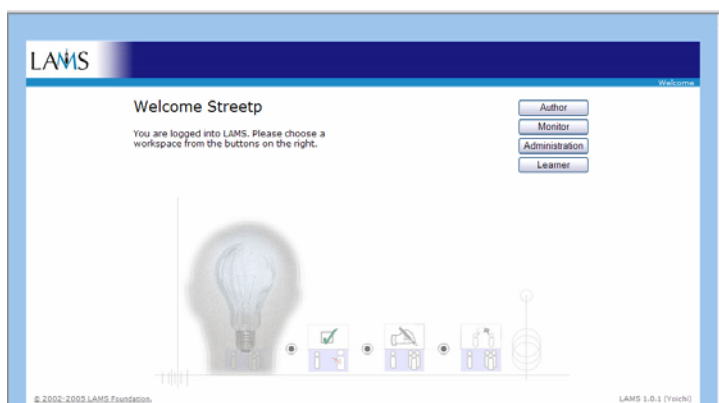
Figure 2 shows the first LAMS screen.

Teacher login screens include Author, Monitor, and Learner buttons.

Learner login screens include only a Learner button unless they have been given authoring rights.

Administrators' login screens include Author, Monitor Administration, and Learner.

The LAMS environment for authors (teachers)

The authoring sequence on this screen (Figure 3) has three parts: the central panel, where you create and edit sequences; the activity tools on the left-hand side; and sequence management (the tools for this are given across the top of the screen—open, save, preview, etc.).

Figure 3 **The authoring sequence**
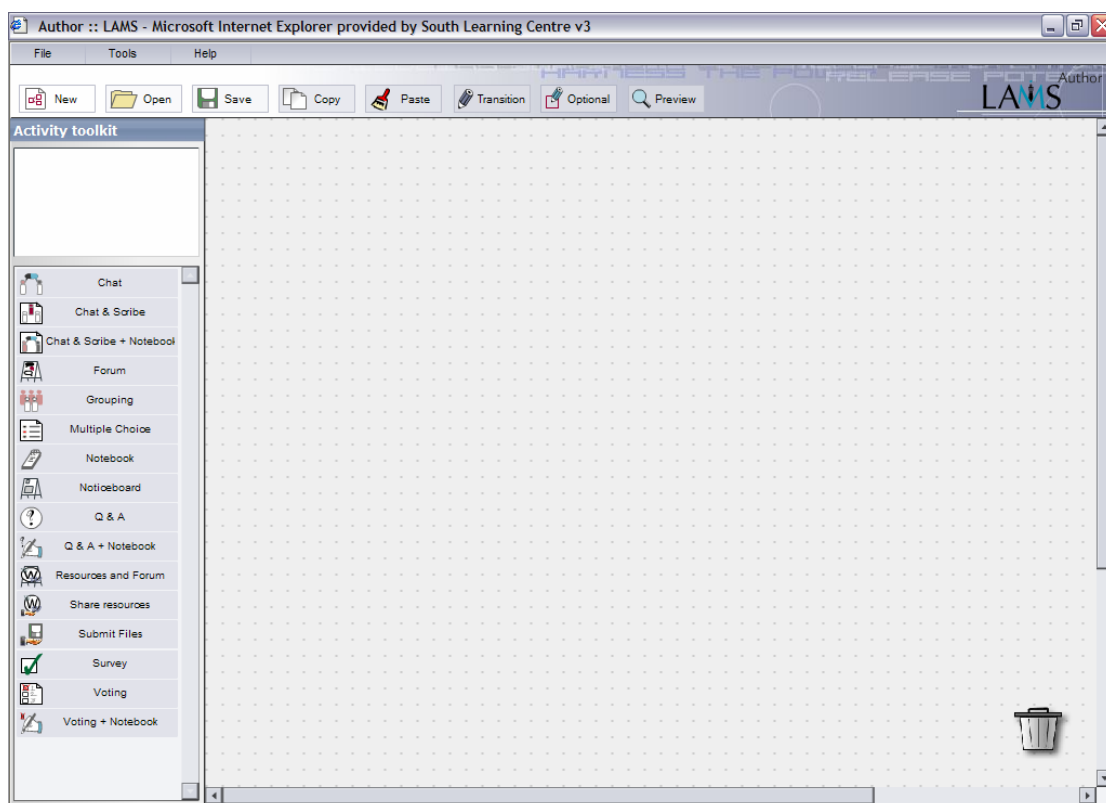
The activity tools

Chat: an informal environment for synchronous discussion. Teachers and/or students can post topics.

Chat and scribe: a Chat session in which a summary can be made of the chat. The first person entering Chat has the task of scribing. Chat participants can agree with the scribe's findings or redirect the chat to ensure all views are considered. The results of such agreement and the scribe's summary are displayed for all participants.

Chat, scribe, and notebook: as above, but with the addition that students can also record (notebook) information for their records, either during the chat session or at the end.

Forum: a space where topics or threads are placed for participants to comment on. Comments can be made on the topic or on others' responses. Forum can be synchronous or asynchronous. It can be closed at the end of the activity or kept open until the sequence is disabled.

Grouping: a tool designed specifically to "modify the behaviour of other tools rather than conduct an activity in its own right". This feature enables the teacher to have random groupings for various activities, such as chat and forums.

Multiple choice: multiple choice and true/false questions can be selected for assessment purposes. This can provide data for summative and/or formative assessment.

Notebook: a place for students to record their own notes during a sequence. The author/teacher can view these notes.

Noticeboard: a tool designed to create notices. Frequently used at the start of a sequence to let students know what the purpose of the sequence is. It can also be used during a sequence (e.g., to prepare for an activity) and at the end (for summing up and/or further instructions).

Q@A: a question is posted and the answers recorded. All answers are displayed. Student names can be displayed or hidden, depending on teacher selection of this option. A useful tool for (but not limited to) brainstorming-type activities, compare and contrast, definitions, or questions relating to content and understanding of prior activities.

Q@A and notebook: Q@A as above with the notebook set as a compulsory activity. This could be used to record ideas students did not think of, or summarise, etc.

Resources and forum: students can access resources posted by the teacher (such as websites or shared files). It is possible for students to share their own websites and files with each other during the lesson, but the teacher has control of this option. Forum provides for synchronous or asynchronous discussion.

Share resources: same as above, but without the forum.

Submit files: learners can submit files to the teacher.

Survey: this tool became available only after our unit was planned, so we did not use it. It offers the flexibility of single, multiple, and text-entry answers to questions. Teachers use this tool to make questions compulsory or optional.

Voting: a list of options can be provided so the students can vote. It shows the learners the collated responses.

Voting and notebook: as above, but with the addition of the notebook tool to record responses.

Journal: a tool designed for students to record their own thoughts on aspects of their learning for the sequence. The teacher provides guidance for this activity by recording content instructions.

Authoring

This is a five-step process.

1. Click on activity tools and drag them onto the central panel of the screen (see Figure 4).

2. Save at each step of the process—as each activity is linked, as you add content. Bugs in the system in the earlier versions meant it was imperative to remember to save at each step, as some sequences were lost or became locked and the system crashed.

3. Double click each activity tool to open it and include content (see Figure 5).

4. Preview the sequence from a learner's perspective (see Figure 6).

5. Make any adjustments, save, and then release for the class to use.

Figure 4 **Step 1—click and drag tools**
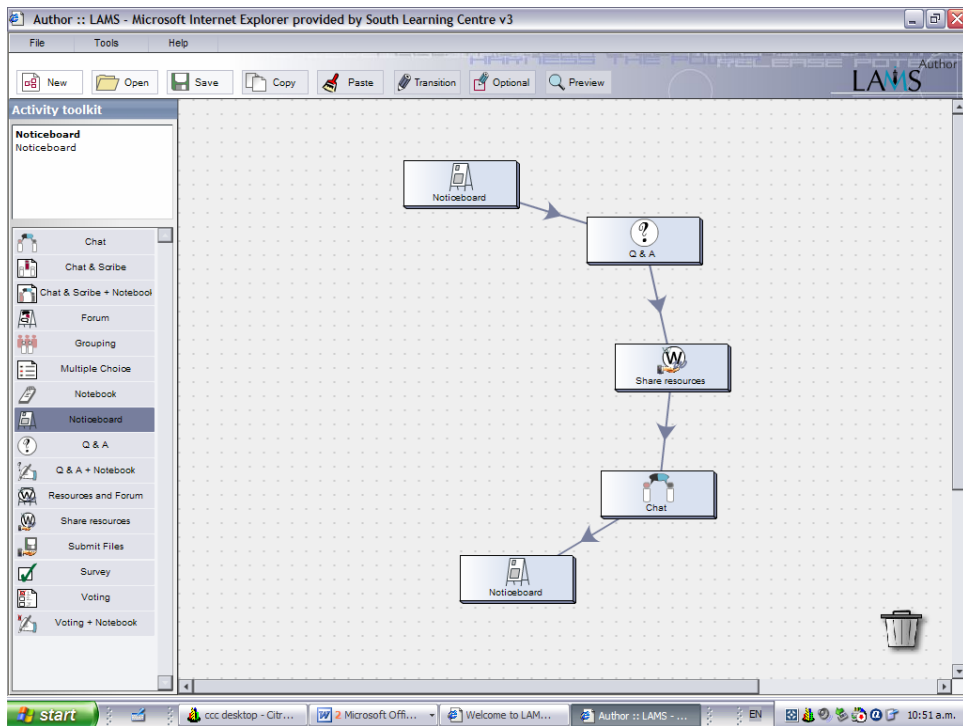
Figure 5   **Step 3—open activity tool by double clicking on it and include content**
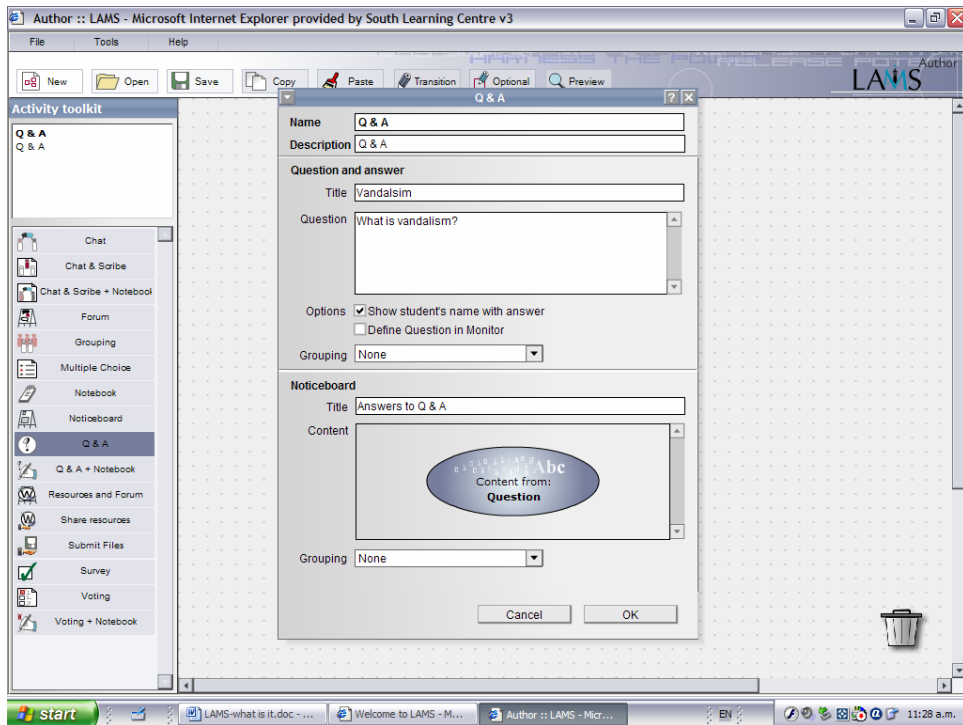
Figure 6   **Step 4—preview the sequence**
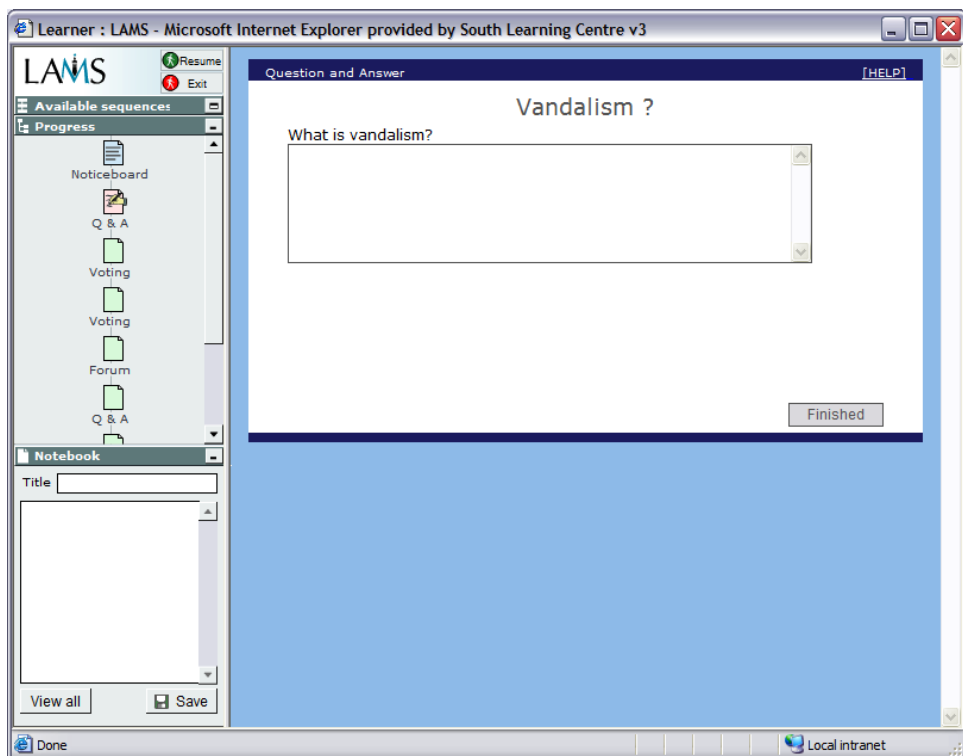
Monitor

This area enables the teacher to do the following:

1. Activate the sequence and release it to the class (see Figure 7).

2. Monitor class progress through the sequence (Figure 8).

3. Monitor and read the answers of all students for all activities (Figure 9).

4. Manage sequences—e.g., disable, archive.

Information on how to release sequences is available in the LAMS Teacher's Guide.

Figure 7 **The session information of the sequence released to 20 of the 30 learners who started this sequence**

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Figure 8 **This screen displays the progress (green dots) of the students as they move through the sequence. Hovering over a dot will display the student's name.**
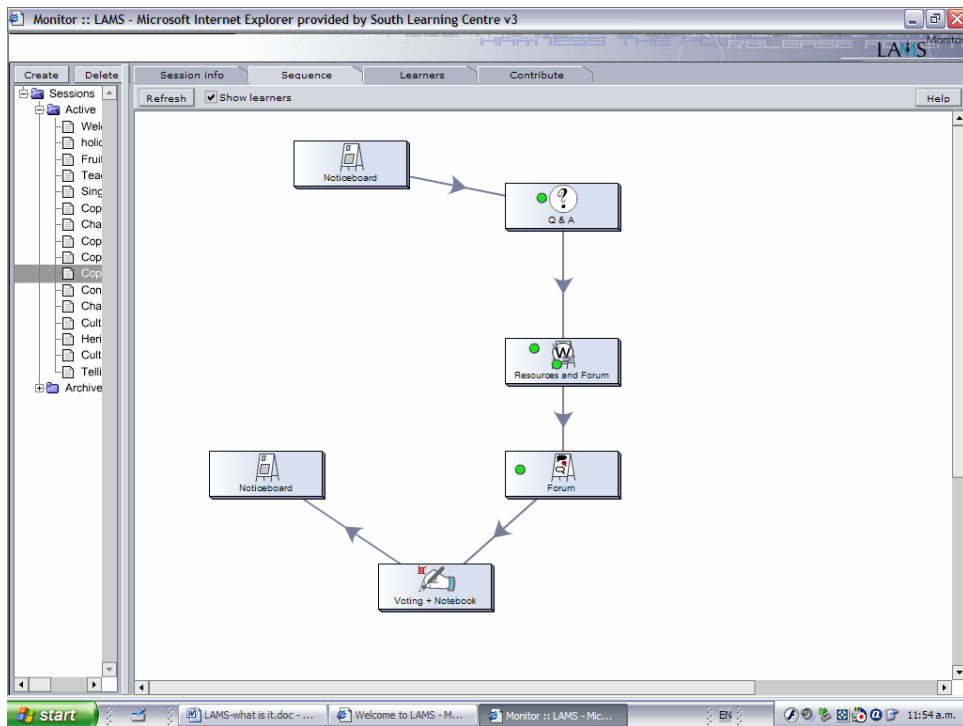
The screen below (Figure 9) displays the names of the individual students and where they are on the progress bar. Blue denotes finish, red the position where they stopped, and green not started. Double clicking on the blue dot displays the tool and answer options and by clicking on the orange dot you can read the answers—see Figure 10.

Figure 9 **Monitoring learner**

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Figure 10 **Accessing individual students' responses**

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

4. Findings

In this section, the results of the action research carried out by the teachers and the ICT facilitator (see Appendix 3) are looked at through the lens of the overall project research questions. Observations by the project co-ordinator, interviews with the teachers and students, and LAMS sessions undertaken by the teachers have also been used as evidence to endeavour to answer the six research questions as outlined in Section 2.

1. How effective is the LAMS program in providing an online environment for collaborative learning experiences?

Teachers' perceptions of LAMS

In the experience of the teachers, LAMS was seen to provide a user-friendly, effective, and safe online program that gives teachers (and students) access to another tool. One of the teachers, Anita, took this further and stated: "It was a tool to be utilised within your teaching to achieve a common goal, outcome, and understanding." Although confidence and competence of the teachers grew over time, at the outset it was seen by one teacher in their LAMS journal on the first trial sequence to have potential but she "didn't find the very first step completely intuitive but that's because I don't read instructions very well".

LAMS enables teachers to develop learning sequences using a variety of activity tools that all have the potential to contribute towards a collaborative learning environment (refer page 18 for a complete list of activity tools). However, the quality of the learning environment was clearly affected by the teacher's development of the content and purpose of the activities chosen within a sequence. This is reflected in Anita's comment that:

> We were able to do this effectively through first selecting a topic that was of **'high interest'** and would engage the children. Vandalism was certainly a topic with which the children could relate, as it could be found in and around a number of communities within Christchurch and it was also a topic that allowed the children numerous opportunities to express their thoughts, ideas, and opinions. They also developed their ability to justify their points of view whilst accepting that other people may have a differing viewpoint to their own.

Teachers' management of the environment also played a part in fostering collaboration and this can be seen in Jackie's comments:

> The students who completed the sequences first were also very helpful if subsequent students struck problems. The "Each One Teach One" philosophy was alive and well in our room.

The LAMS environment is user-friendly, both from the teachers' "authoring" perspective and the students' "learner" perspective. The first "awareness" of what LAMS offered for a collaborative unit was through the use of a promotional PowerPoint presentation followed a few months later by a hands-on training session that involved teachers in actually experiencing the program from a learner's and author's perspective. Teacher reflections endorsed the suitability of LAMS for a collaborative project:

> From what we can see it looks good.

> Appears to have sound pedagogical basis.

> We won't really know its potential until we use it [with a class inferred].

> I can see that students would really love it!!

> (Principal and teacher observations—July 2004)

At the conclusion of the unit the teachers' endorsements of the program as a tool for fostering collaborative learning remained strong. This can be seen in the following comments:

> **Anita**: I do believe that the sharing component that the LAMS environment allows you to take part in online is one of the key advantages this program has to offer.

> **Jackie**: [The use of LAMS] gave all students the freedom to express their ideas. In class discussions, it is sometimes difficult to get all children to respond and some cop out by saying that they agree with so and so. By using the LAMS environment all the children were required to respond and give their reasons for their thinking.

Although LAMS offers a wide variety of tools to develop "collaborative learning experiences" our teachers' experiences showed that the quality of sequences (in terms of selecting the most appropriate activity tool for the outcome required) improved over time, as mentioned in Jackie's reflections:

> Over time, too, we got better at designing sequences, like, especially once the children had been on it, you knew how specific you had to be with your instructions for a start and you had to word things really, really carefully.

One of the earliest issues arising with the use of Chat as a collaborative tool was a limitation of the group selection option. LAMS enables random groups to be set by the teacher but not an option to pre-select groups by other criteria, for example to ensure a cross-sample over two schools and/or gender. A number of options were considered including all online for session one "just to see what it is like" and contriving the groups by teachers phoning each other and allowing students to log on at specific times to ensure the "group selection is a cross-section".

Teachers were encouraged to consider trialling and using a variety of the tools to achieve their learning outcomes. The teachers decided that they would use the Chat tool as the means of collaboration across the schools and use the forums and other tools as collaborative tools within each class. The reason for this was due to the teachers' and students' familiarity with Chat and it was seen as a more "informal" environment. Although the Forum tool offered similar benefits and

the advantage of synchronous and asynchronous chat, they preferred to keep the forum for "more structured" sequences.

The original chat trial towards the end of Term 1 was cancelled due to unexpected school activities and this was carried forward to the first week of the following term. The teachers were adamant, despite suggestions of alternatives, that they wanted the first chat to involve all students and preferred not to use the random grouping option so "we can see what it is like".

On the first chat experience, 39 of the 59 learners managed to get online and begin their chat activity. Only eight students actually completed the sequence, i.e. finished chat and read the final noticeboard. This cannot be seen as anything other than students either not completing the activity due to "running out of time" or simply failing to realise they "were required to finish chat and read a noticeboard before the sequence was completed".

This activity had everyone online together and although the teachers found this frustrating as expressed by Jackie "it was really manic with responses being posted at a rapid rate which totally bamboozled the students and the teachers but the children enjoyed it" the general consensus of opinion of this exercise, despite little educational learning outcomes, is summarised by one of the students in the chat session:

> A9 says:
> this is cool

Students were highly motivated to participate in chat but not necessarily on the topic set by the teachers. This could be attributed to a lack of common understanding of how two different age groups define the word "chat". This is reflected by students perceiving a certain amount of novelty at using "chat" within the classroom learning situation as expressed by a student's surprise" "We're gonna be able to 'chat' in class!"

A number of unintended outcomes resulted for chat sessions. These are evidenced in the examples below. The chat sessions enabled students to find out about each other, share relevant information, and take on a mentoring role with each other.

Example:

The instructions for the task were:

You are required to introduce yourself. Tell your buddy two things about yourself. Ask them two questions you would like to know about them. Tell them two things about your school and ask them two questions about their school.
Room: ChatGroup1072

Sharing information

A4 says:
Hi my name is *[name given]* i play rugby on saturday for shirley and im 11 but its my b-day on sunday what sport do you play and whats your hobbies

A9 says:
hi im *[name given]* and im 11 years old and ive got a cat

A13 says:
oh and Im ten

A7 says:
hi my name is *[name given]* i am 11 years old and i have a cat

Threads of conversation enabled some children to find out about each other

A13 says:
I have 2 destructive puppies who have already dug a hole in the floor and made a hole in the fence

B2 says:
i do kickboxing and i play league i like hanging around with my mates

B11 says:
hi im *[name given]* do u play basketball thats one of my hobbies

Other students shared some aspect of their school

B19 says:
I like playing in the play ground in School B. School B is a really awesome place and teachers are kind and helpful

Students became mentors to assist students who were unfamiliar with procedures or requirements, for example, a student entered the space bar on more than one occasion and others provided guidance:

A7 says:

A7 says:

A7 says:

A7 says:

A7 says:

A7 says:

B2 says:

please don't press the enter bar so many times Just when you finish writing

During the 10-week unit, chat sequences met with varying degrees of success as highlighted by Jackie: "Once I didn't release the chat session to the combined class option so we happily chatted to ourselves. Other factors were out of our control, e.g. the Net was down. If I did this again I would… give the students time to chat to each other, so that they have a better understanding of how they should respond and question each other. This should help develop their chat skills to allow for higher-level exchanges as opposed to the one-off statements that the teachers viewed as talking superficially, for example, 'Hi I am a Boy'." (A4)

Forums as a collaborative tool were used four times in the various sequences. The functionality of "replying" to others was used by students with varying degrees of success in terms of content. The students initially struggled with the forum format:

> they found this tricky because they had to remember to click [on the Back to Topics button rather than the Close button, see Figure13] to go back to the previous screen

This was also in part due to teacher lack of experience of setting forum tasks as reflected on by Jackie:

> Next time we used this activity we made sure that the question was written on both screens, with instructions, and once they [students] worked out what to do this was a breeze for them.

Forums enabled greater collaboration and justification of ideas but, again, quality of content was variable, e.g. student responses:

> **B21:** Why do you think that?
>
> **B3:** Becose I am wise (partner reply)

> **B11:** Why do you think it was bad?
>
> Justification from the partner: **B14:** It was a sight [sort] of vandalism

B2: What happened

Partner answer: **B11:** A man took his anger out on chopping down the tree on someone elses property. I don't think this is a good way to express your anger

B11: Why is it not good?

B3: because

B2: give us a proper answer [name of student]

Figure 11 **Message board forums**

Forums also provided an opportunity for students to provide feedback/help to others on their views, e.g.

Agreement

B1: I would have called the police

B7: [partner replied] I agree

Alternative views

B7: I would of found something of theirs to destroy and see how they feel

B16: Response: I would certainly not find out who it was and destroy their property i would let the police deal with it

Students were also able to provide support for each other.

A student entered a forum unsure of expectations and procedures and did not ask the teacher but asked their peers instead.

B23: What do I do

B19: reply to other messages

B22: you need a capital [referring to a partner's posting where the letter had been written in lower case]

Resources and Forums is another activity tool that enables the fostering of a collaborative environment. This activity tool was used in three of the sequences but the teachers chose only to share their resources and did not use the option of students sharing their resources with each other. "Many of our tasks relied upon the literacy ability at the expense of creatively responding to things. It is possible to use this environment in a more creative way and exploring these options is the next step." In Jackie's opinion" "We only scratched the surface of this environment."

Resources and forums were used in the following manner with the following results (refer Figures 12 and 13):

Figure 12 **View resources Internet links**
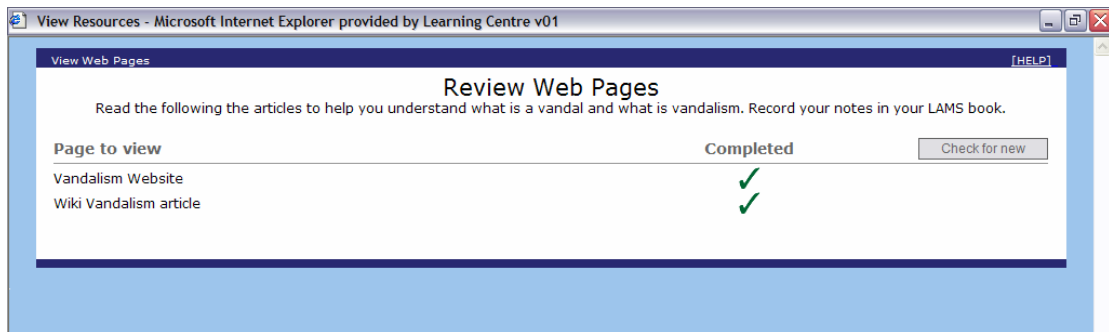
The intent of the forum was to "share" with others as seen in Figure 13 below.

Figure 13 **Forum definitions**
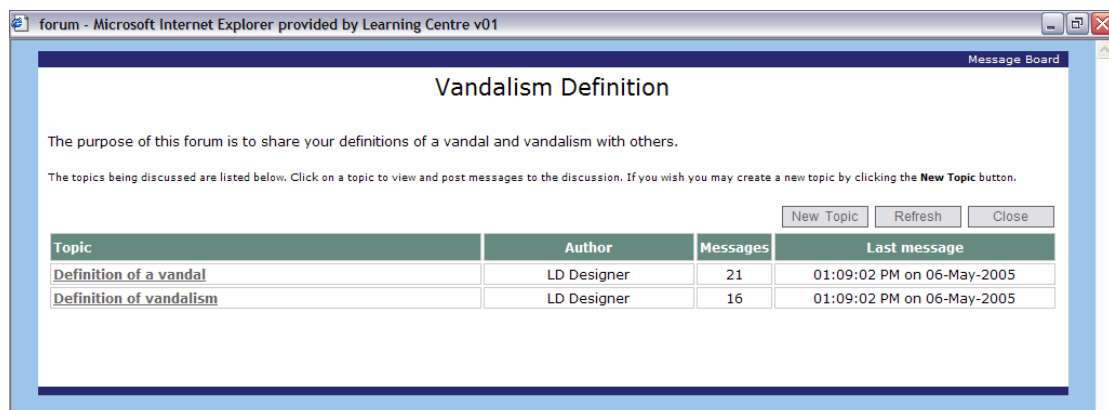
Teachers envisaged students would reply and discuss their definitions. However, the result was the students in the two schools used the forum differently. School A students used it as a message board by "posting their definitions". Not one student "replied" to any of the other students' definitions, e.g.:

> **A6:** a vandal is some one who is sad angry or tring to exprese them selfes and may ruen their lives
>
> **A23:** My definition of a vandal is that it is someone who is depressed and has no one to turn to so they do graffiti and tagging.

School B students used the forum as another means for chat alongside the posting of their definitions. This was more evident in the responses to the first topic compared to the second topic, e.g.:

> Topic One
>
> **B5:** wot u up 2
>
> **B3:** no slang
>
> **B19:** yeah xxx NO slang
>
> **B2:** vandals are losers because
>
> Topic two
>
> **B2:** a vandal is rong
>
> **B25:** give a reason
>
> **B2:** vandals are people that destroy and wreck property that arnt yours

During the reflection process and review of this sequence the teachers discussed the need to be very clear about the purpose of the activities, using the most suitable tool to achieve this end and to be consistent and repetitious with their instructions, both prior to and on each activity. Teachers considered chat outcomes may be improved as suggested by Jackie "preparing students for chat" through more "teaching on questioning" and by including a noticeboard before the chat activity, outlining what they had to think about and prepare for. Consideration of changing the name of the activity from "chat" to something more formal, e.g. discussion, write, and respond might help "minimise the chat mentality".

An advantage of the collaborative learning as seen by Jackie was that:

> The LAMS environment was particularly attractive for children who disliked writing up information in their books and to those who were self-motivated when completing tasks as they could work at their own pace. The LAMS forum enabled children to express their ideas confidently, suiting the reserved child who has difficulty speaking in front of a group.

In School A student evaluations of the unit, 12 students recorded chat as their most favourite activity, also evidenced when Jackie asked who wanted to participate in chat today: "all of my students' hands would shoot up". Jackie perceived her students "liked the fact that other people could see their answers and could see what others thought".

Students' perceptions of LAMS

Overall, the students were positive in their comments about using the LAMS collaborative learning environment:

> **B8**: LAMS has very interesting activities and you can see every bodies responses to the questions. LAMS is a fun way to learn.
>
> **B25**: On the computer you get to read what other people have said and then you can answer the questions.
>
> **Q**: Did you find that helped you answer the questions?
>
> **B25**: [inaudible—nodded head]
>
> **Q:** How did you find it when you were working with another class—did you find that you were able to share information, maybe information that you didn't know or was it more that you had an opportunity to talk to them about issues?
>
> **B25:** The difference of what they did in their unit.
>
> **B19:** I like sharing my ideas and I think that you can learn more this way.
>
> **A20:** I enjoy seeing other people's answers as well. You have more of an idea of what it's about—just what they're thinking.

However, some students did have mixed opinions about the online collaborative learning environment:

> **A21:** I'd rather speak face-to-face so then you know who you are talking to.
>
> **A13:** Yeah, I'd rather talk to someone too.
>
> **A20:** Cause sometimes people like [inaudible] with their questions. You can get past any problems.

In the experience of the students the Chat tool was seen to be a most suitable activity and it was seen to be "cool" to be using this type of environment within a class lesson to the extent on offering advice for improving the unit "Only chat to others as opposed to doing any other

activities" (B2). For the children, chat was social discourse, just as in a normal chat environment, and the only difference was it was a permissible activity in class time.

A feature all the students liked was the ability "to see everyone's answers". Anita pointed out that once the students realised that not all of the activity tools could be revisited to change or expand on answers they became more thoughtful about what they wrote.

In this section we have considered how effective the LAMS program was in providing an online environment for collaborative learning experiences. Teachers' and students' reflections of their experiences in using the LAMS environment show evidence to support the effectiveness of this program, the usefulness of which is best encapsulated by Anita: "The best learning comes from each other and the LAMS environment allows us to learn and share from each other."

2. What is the nature of students' experience of learning in a collaborative learning online environment?

Various levels of thinking (Bloom's Taxonomy) were evident in the student responses to the various tasks in the LAMS sequences. Some questions were at the lower level that required an answer only, while others were at the higher levels and the students had to justify their thinking. Examples of this higher-order thinking are:

> I think it is an act of vandalism, because the flag isn't his. (A23)

> No I don't think it was vandalism, because he was protesting. (A17)

> Yes because it was willful destruction of property. (A20)

> Well almost everything surprised me. I thought that there would not be very many examples of graffiti, but it turned out to be graffiti central! What surprised me the most was to see how this really effects things, cos the dairy had been shut down and that all the things were mainly just tagging. It also surprised me that um someone had tried to tag over a STOP sign and that would be extremely dangerous at night, cos no one would be able to see the sign and that made me think because this guy has tried to do this and someone could loose their life just because of this. The amount of graffiti that we found amazed and shocked me. (A13)

The use of the LAMS environment was viewed as a way of sharing information and of finding out what other students were thinking in response to the question posed. It was also seen as a way to help clarify one's thinking:

> Other people can see our answers instead of it being in our books. It's open to everyone and you can see how they think. (A20)

> On the computer you get to read what other people have said and then you can answer the questions. (B25)

For some students it was a source of motivation because of the "novelty factor" and/or a different medium for recording their work:

I like using the computer rather than having to write in my book. (A13)

I like using the computer instead of writing it in our books. It was something new—not boring like writing in our books. (A21)

I like using the computer. It was something different. We don't normally get to use one. (A13)

Students also saw that using an online environment allowed students who do not normally participate in class discussions to have the opportunity to participate in a safe environment:

They get embarrassed or something. They don't get so embarrassed on the computer because it is not face to face but in class we turn around and look at the person who is speaking. (A27)

One student put forward that they felt a sense of trust by the teacher that they would go on the computer and focus on the task at hand:

I kinda feel trusted. You can go on the computer and the teacher knows you're not going to do anything stupid on it. (A21)

However, some of the students did express a sense of frustration with some of the discussion items posted in the chat activity:

When we're talking online, like in the chat. The other school always changes the subject— like 'Hello, what's you name? How old are you?' They talk about personal details instead of the topic. (A20)

I agree with what [name given] was saying about the chat. (A13)

In chat room because when you type in the words it will just come up and then other people keep on typing words and I mean, when you read you only get halfway and then other words will come up as well cause other people are typing as well. (B25)

I found it [the chat session] very hard to read. (B19)

During the interviews carried out with the students, the overall impression gained was that the students saw the use of the LAMS environment as positive. Although other activity tools were used in the various sequences throughout the unit, the chat activity was the one that had obviously made an impression on the students. The online environment was seen as a way of sharing information and gave everyone the opportunity to participate in the discussion.

3. What are the critical success factors for students and teachers in developing and using a collaborative learning online unit of work?

The critical success factors identified by the teachers were:

- time;

- professional development;

- confidence and capability;

- access to computers;

- a support network; and

- effective teaching practices.

These critical success factors will be discussed in detail in the following section.

While for the purposes of this report they have been discussed separately, the inter-relationship to and with each other cannot be overlooked. This is best encapsulated by the view of the project director:

> The project owes its success to the professionalism, dedication and willingness of the participants to: take risks, upskill and extend themselves beyond their comfort zones [in terms of using LAMS and their own action research], develop strong interpersonal relationships with each other and ensure what they were doing was constantly meeting the needs of their students. In addition without the TLRI project funding this project would not have been possible as a significant critical success factor was the provision of time to ensure the team building, professional development needs, planning, implementation and evaluation of the teaching unit and project could be carried out.

Time

Time was a significant issue throughout the project. All people involved in the project had heavy workload issues combined with busy personal lives. Funding from the research grant provided time for teachers to meet and plan, and as noted by the ICT facilitator "the release days available...enabled [project work]…to be done when the teacher was not tired from a day in the classroom". This release time was considered invaluable by the participants. Jackie noted: "It would have been near impossible if we didn't have the release time that we have had. I don't know how you would do it without the time that we've actually got together." As if in answer to her own question, Jackie later commented it would be done in "hours after school. That would be hard and trying to get times when you could both meet and things."

However, despite the availability of release days, the teachers were still reluctant to leave their classes during a school day and to find a time outside of school hours was impossible with commitments to school sport and cultural teams, duty, staff meetings, parent interviews, and additional numeracy and literacy contracts. After meetings teachers returned to school to catch up on school work missed and often with either behaviour issues to follow up on or/and marking of the set work left for the morning. This project added to the already high workload of teachers. Changes in personal circumstances and health issues were also significant issues affecting all members of the group at some point during this project. This in turn affected timelines for trials and ultimately the implementation timeline. The buffer of five weeks, included in the projected 15-week unit, was needed and in reality the unit became a 10-week hands-on due to the impact of these external factors. One of the planned sequences did not eventuate due to pressure of time as evidenced when Anita requested "time to get our heads together", to take the pressure off her

students due to other school commitments and allow the students "time" to finish work well rather than "move onto another sequence".

Time was also required to trial the new system and ensure any software and network issues were identified before using with students. Although LAMS provided a list of specification requirements there were significant implications for School A which was using a MAC-based platform.

> We had problems connecting to LAMS at the start. To run LAMS it is recommended you are operating on Mac OS 10.2 or above [Mac users]. I have not been able to release sequences from school so thank goodness I have a PC at home as I would have not been able to release sequences. This is a problem because if you don't release sequences you can't monitor them.

School A teachers experienced difficulty as they did their training on a PC platform and then worked on Mac computers in their school. They developed and trialled the sequence as a learner using a PC and then on their return to school, the use of the program was not always the same due to the configuration of the network at the school. Jackie expressed her frustration regarding this situation:

> …the students had to completely logout from the Internet every time they completed their work. If they didn't, the next person to use the computer would be logged on as them. This was painful from a management point of view because I had to enter the password for Internet access each time a new person started a sequence. I would've rather connected the computers to the Net once and left the students [to] get on with it.

Time was required to build positive working relationships between all stakeholders and in particular the two teachers who implemented the unit. Jackie identified "The most effective strategy in fostering collaboration between the two schools, was the chance to plan together. [We] were able to bounce ideas around and develop sequences that supported our class activities. The nature of collaboration changed over time as [we] got to know each other." For Anita the time to meet was seen to be "extremely beneficial" not only from developing and fostering relationships but also from the perspective of "It gave us the chance to voice any insecurities that we may have had (and there were many) and also assess our 'Where to next' plan of attack."

As commented above, the relationships did change over time and this was evidenced in the length of time taken to "meet and greet" at each meeting and the topics discussed in this time. In the first few meetings the meet and greet was confined to the social conventions of "hullo", "sorry I'm late", "xxx happened". As the relationships grew and an environment of trust and caring was created, these social conventions changed to more demonstrative methods like hugging each other on arrival, checking up on personal issues discussed in the last meeting: "So how did xxx go?" "What was the result of…?" to the extent that up to 20 minutes could pass. The individual was now as equally valued as the outcomes of the project. The increased trust also brought about changes in how freely suggestions, strategies, and reflection of personal practice were shared.

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Time impacted on all aspects of this project and further discussion of this will be considered within each of critical success factors that follow in this section.

Professional development

Regular meetings were held throughout this project. The frequency of the meetings was also a key factor and is commented more under Confidence and capability. The purpose of meetings was threefold: (i) an opportunity to foster relationships to ensure a safe working environment where people were prepared to be honest and take risks; (ii) planning and reviewing each week's LAMS components of the unit of work; and (iii) providing professional upskilling based on "organised professional development" and "just in time learning" around the needs of computer skills (in relation to using LAMS), information literacy capabilities, pedagogical practice, and the writing of an action research report.

Building and fostering relationships has been commented on above under Time. However, it cannot be overemphasised how important the relationships were to developing a collaborative working environment and for ongoing encouragement.

The first professional development session enabled teachers to experience the LAMS environment from both the learner and author perspectives. The trial sequence included a range of the activity tools so teachers could experience first hand what this environment was going to be like when students logged on. There was no formal teaching when the teachers attempted the task as a learner, apart from logon instructions, advice to read the instructions, and to scroll to the bottom of each page and click on finish when each task was completed. One of the first activity tools asked them to describe their feelings about using LAMS and being involved in the trial and the following statements were recorded (anonymity was guaranteed for this task):

> Excited
>
> Worried at present—hope it does not fall over.
>
> I feel a little anxious but excited at doing something new and maybe very useful.
>
> Curious and scared

It was interesting the way in which the teachers approached this first task and the facilitator noted they "sped through it, writing brief statements to the question and answer activities" and it took "considerably less time to complete than envisaged, they just wanted to click though it all". This was a good learning moment, as it was indicative of what the students would do when they first went online.

At the same time this sequence was in progress the monitor option was displayed on the data projector so the teachers could see how the facilitator monitored their progress and answers. This displaying of the monitor strategy was subsequently used by Anita with her class. This was seen as another method of promoting awareness by the students that the teacher and not just each other could see their comments.

Training for author mode was more involved. The teachers were provided with an overview of the various activity tools and their purpose and the relevant sections of the LAMS user manual provided for assistance. Teachers were encouraged to make mini sequences and release these for the other teachers to use in the session. This task was completed with more one-on-one interactions as they became familiar with the tools and could see the potential for use, or needed to ask for assistance because "it won't let me move on". Teachers did not encounter any significant problems in using these tools or developing their trial sequences.

One of the unfortunate outcomes of the training was the time delay from when LAMS could be accessed by the teachers within their own home and/or school. Training had occurred in the last term of 2004 but access was not possible until early 2005. Also, one of the original members of the project team needed to withdraw and was replaced by a teacher who had not used LAMS. This necessitated a further training process to be incorporated as part of the planning meetings in 2005. Ideally, training should be followed as close as possible by a writing sequence session and trial with a class to maximise the confidence and competence developed at training sessions.

The teachers in this project saw LAMS training and ongoing support as essential. Caroline stated: "It [the PD] was great. I would cringe to think of doing a project like this without the PD that we've had, and having you guys to call on. I found it quite difficult anyway as my computer knowledge is quite limited."

Anita expressed "I think we were given lots of professional development" but she identified the need for additional hands-on outside of the time provided: "I found I wasn't having enough time outside of that [PD and meeting sessions] with all my other school stuff and other responsibilities and everything else to actually really go on and have a play [with LAMS]."

Recommendations for the first use of LAMS also came out during the reflection sessions held at each follow-up meeting and in the project reports. It appears the idea of having a brief trial sequence to overview the programme or, as Caroline said, "Actually a bit of teaching of how to actually get around the different sequences… Just a bit of pre-knowledge of actually using the program—what they can expect to see come up and those types of things first" may be required. Jackie also endorsed this view: "Take the time to allow your class to try mini sequences...to familiarise themselves with the environment, before you launch into the main topic."

The project director noted: "The actual task of writing LAMS sequences is easy, when you know what you want to achieve and which activity tools are the most suitable for what you want to achieve. The task of writing can be as little as 10 to 20 minutes." It was not so much the using of LAMS that required time but the ensuing discussion around the purpose of the sequence. It was important the teachers responsible for the implementation of the unit and sequences had a common understanding of what they wanted to achieve, and this took time and discussion. As Anita expressed to her ICT facilitator: "Working with others to achieve a common goal was a major factor in being able to sustain the use of LAMS, especially with all the other demands on a classroom teacher."

An observation by the ICT facilitator was:

> The teacher appeared to find the developing of sequences much easier and enjoyable with the discussion and exchange of ideas when working with someone else. The sharing of the technical difficulties [in its broadest sense getting to grips with the program, setting up network to enable chat, coping with 'bugs' or unexpected situations] and the frustrations of these dissipated the negative feelings and gave the teachers the support necessary to keep them from giving up." This sharing and caring for each other and the students involved in the project increased in intensity and depth as time went on.

The regular meetings also provided opportunity for teachers to reflect on their practice and observe what was actually happening in the responses posted in LAMS. Jackie stated that:

> When I analysed the chat sequences I found that the level of thinking was quite low, mainly at the remembering and understanding stage. The children were stating their findings without probing into the reasons for their thinking or questioning the other students' thinking.

Confidence and competence

Time was required to develop confidence and competence in the use of LAMS by both teachers and students. For the teachers this involved the skills and understandings of developing, releasing, and monitoring sequences, as standalone sequences and also within the context of a unit of work for teachers. For the students this involved not only the navigation and typing skills to use LAMS but, more importantly, reading and writing skills combined with the higher-order thinking skills of synthesising and analysing information, justification of their viewpoints, and the skills of writing and answering questions and sharing information in an online environment.

The teachers' confidence and competence grew over time. As discussed earlier, the factors of relationships and professional development were also integral to this development. Alongside this was the regular fortnightly meetings, a key factor as identified by the ICT facilitator: "It was ongoing, regular, planned and of the duration of the project." Anita felt the frequency of the meetings "helped us remain focused and also ensured that we were all working to achieve the same outcomes". The informal collaborative environment "also allowed us to experiment with the many LAMS activities and develop our confidence together". The meeting time frame enabled implementation and reflection between meetings and a chance to identify specific needs. Anita indicated: "The hardest thing for me was learning the program and developing my confidence."

Jackie reiterated this view:

> You need to give yourself plenty of time to become familiar with the activities [reference to the activity tools offered within LAMS] yourself before you begin to design sequences. Making your purpose clear for each sequence is vital to ensure that the tasks remain meaningful. Previewing sequences is helpful and the more you write sequences the better they become.

Caroline also noted that:

> The setting up of LAMS sequences gets easier as you become familiar with the format. It is important to have a clear picture of your learning outcomes for each activity within the sequence and have worked out how it will be supported in the class lesson. There is scope to have a sequence that is a lesson in its own right but many children require discussion to gain optimum learning.

As confidence and capability increased so did the opportunity to experiment more widely with different activity tools and sequence patterns. Anita stated: "The excitement we felt when our sequence activities became more and more sophisticated was unbelievable. We even astounded ourselves." With increased confidence and refinement of tasks came the opportunity "to be more specific in what we wanted our children to gain and achieve from each lesson".

In addition to using the program, "just in time" learning was needed to develop ICT and information literacy capabilities. An example of this was in the design of the sequence using shared resources for the first time. The URL was required in the resource area, and the teacher faithfully began to write the address onto paper from the website and would then have typed it into the space provided. A quick five-minute teaching moment occurred on highlighting and copying the URL and the teacher was thrilled saying, "This is easy." On another occasion when an error message was displayed on a student's screen, the teacher began to faithfully write out the message; a quick five-minute teaching episode on how to use the print screen function ensured this task could be managed quickly and efficiently. The message was then emailed to the IT support person.

When the teachers accessed websites to place on the shared resource tasks it was helpful to have the support of one of the National Library advisers present. She assisted teachers with key words to narrow down their search and asked probing questions like "What is it you want them to do with this information?"

The use of support people assisted teachers in the development of confidence and capability and the ICT facilitator believed the individual support "gave the teacher the confidence and commitment to see the project through". All these small things contributed to building teacher confidence and capability.

As the teachers had not previously researched their own practices, a major component of the professional development sessions was the upskilling in carrying out and writing up their action research. Background readings and assistance at the writing workshops were provided for the teachers. Upon reflection, Anita stated: "I would actually like to do it [research] again now that knowing what I know now cause I think if I did it again I would do it better."

For the students, the teachers perceived the development of confidence and capability as critical in terms of being able to manage the LAMS environment so they could work independently and achieve quality outcomes. The teachers also identified lack of typing skills as a potential barrier for students. Interestingly, not one of the children interviewed identified lack of typing skills as an

issue. Students identified, however, the thinking skills required to contribute online. In response to interview questions about the LAMS environment (A26) indicated "Some of them were easy and some of them were hard", which on further investigation meant the actual "questions" were hard. The action they took to deal with this issue was "to take longer" to answer.

In all three classes the development of confidence and capability resulted in some students adopting a supportive role and Caroline identified this role as "they assisted with problems such as logging on, connecting onto LAMS links, explaining how to move around within sequences".

As stated in an earlier section, the children's use of chat and the teachers' expectation of chat were different. During meeting times the term used by the teachers was the "encouragement of meaningful dialogue" in chat. As Jackie stated at a reflection meeting:

> They treated chat as a sequence… they answered the question…went in flat tack, wrote what they wanted to say and then clicked finished. They didn't really read what was being written by the others or reply to them [or if they did, they quickly reverted to] wanting to find out about people… their hobbies, chit chat…

The teachers also identified the need for a trial of some kind to develop the confidence and competence to achieve better outcomes, or in Jackie's words during a meeting "chat needs to be sharpened up" as they [students] are "not developing the skills" [inference of higher-order thinking skills]. Anita's response to this was "I think this just comes from practice."

Caroline was of the opinion confidence would be increased if a "tool learning" time was provided. "This could be in the form of a mock sequence designed to give the children experience in clicking through a sequence. This activity could be done in pairs or threes so all are on the computers at one time."

The teachers felt their students gained in confidence and competence in using the LAMS environment and a computer in general. All three teachers made comments during interviews that their students had become more confident in their skills in using the LAMS environment:

> Jackie: For my ones that were a little more reticent because they didn't feel they had the computer skills and now are just so happy to be on the computer. They feel very savvy because they're just as knowledgeable as anyone else; it's really improved their skills. And I've noticed a couple of them saying, 'I'm getting faster with my typing now.' You know, they're starting to just type away, so it's really improved.

> Caroline: Even things like logging in, 'Oh that's right, I remember what to do here. I have to put this in. I have to put that in.' I think it's been really good.

> Anita: I think that with overall their confidence in using a range of programs like LAMs—if they had something similar presented to them later on they would be okay about using it.

Access to computers

Access is clearly an important issue when considering across-school collaborative projects. LAMS had the advantage of a variety of activity tools that enable both synchronous and asynchronous sessions. It is not necessary to have a computer for each student as Jackie's experience shows:

> I operated a system where the students chose when they completed tasks during the day. Once a task was completed they ticked it off on a chart. This ensured the computers [a pod of eight] were being used for the majority of time and the students were able to complete tasks when it suited them and when the computers were free.

However, what was restricting was the access for synchronous chats, which were the sessions the students loved the most. "Internet access in the classroom" was identified as a significant issue for School B from the outset of the project (LAMS trial feedback). As School B did not at the time have access to computer resources, Anita "managed to factor [a visit to the South Learning Centre] into our weekly programme" but this meant restricted access of one-and-a-half hours per week on a Thursday morning. As School A could only have eight students on at any one time there was limited scope for chat sessions to develop "meaningful dialogue". Both teachers felt increased access would enable students more opportunity to "get to know each other" [at a deeper level].

Anita suggested that School B's access by way of weekly trips to the South Learning Centre possibly made them "more focused".

> So they knew that was our day and they had to make sure they were early for the bus and I suppose that did make us more focused in that way. I mean, it would be fantastic if we had the resources here [at school] to be able to just do it a bit more spontaneously but I suppose we weren't really in that position where we could be as spontaneous. I suppose, just think about it, if we had it in the class like that [access to a pod of computers] I would have to be really, really organised because if I had six kinds of things on the go I would have to have them already set up and that would add to your planning.

Jackie expressed concern that chat sessions proved a little problematic to organise due to their synchronous nature which meant that these sessions times were "limited". "It would have been interesting to see what it would have been like if we could have chatted more freely." As commented earlier, Jackie stated, "If they spent more time with chat this would have improved" [reference to her analysis of chat sessions which revealed the level of thinking exhibited was "quite low, mainly at the remembering and understanding stage"].

A support network

Jackie expressed strong opinions on the necessity of having a support network to call on:

> I would recommend that if teachers were going to work using this environment they surround themselves with people who can support them. Without the time we had to familiarise ourselves with the LAMS environment and the technical support that was available to us I really do think I would have chucked [in] the towel.

The feelings expressed were due to a number of technical issues experienced by this teacher that were not of her making. The school required additional technical assistance to enable the chat sessions to run and other modifications to their network to meet the specifications. This was compounded by various incidents of unusual occurrences; for example, she could release the sequence for her class at home but not at school, and sometimes there were inconsistencies with what students saw on their screens. Jackie had access to ongoing support and she commented, "I certainly wouldn't have been able to figure this out on my own."

Regular, ongoing support was identified by all participants as an important factor and is evidenced in the comment in the critical success factors of time, professional development, and confidence and capability sections. The ICT facilitator summarised these discussions aptly: "If teachers are to be encouraged and expected to work with the new technologies…they will need to be supported…by a structure and organised support system where colleagues and outside personnel are used to encourage, share ideas…."

Effective teaching practices

This project had the involvement of confident and effective classroom teachers who already used a variety of teaching and learning methods and strategies within their classroom. To them, LAMS was simply "another teaching tool that can be utilised to enhance your teaching and learning". Anita stated that:

> The program adds another dimension to the way in which the children can research, develop their thinking skills, share their findings, and gain new information. LAMS gave the children the opportunity to extend their thinking and find solutions to their questions.

The way in which sequences were developed also indicated that teachers used effective teaching strategies that they utilised in their face-to-face class. The scaffolding of using the activity tools Q&A, Multiple Choice prior to a forum or chat activity meant that students were able to develop their thinking around a topic before they were asked to express an opinion.

From the outset the teachers identified the LAMS sequences that would be used alongside other class activities on the topic of vandalism. "It just seems like, it needs to go hand in hand with your classroom teaching," said Jackie. The vandalism topic was also chosen, Anita said, because "it was of high interest to our particular children".

The "hybrid" nature of the unit meant that alongside the LAMS activities a variety of other activities were included, such as analysis of photos from the resource kit, fieldtrips to photograph graffiti, and a guest speaker (see Appendix 1 for unit plan). Jackie put forward that, "Prior teaching and discussion was essential in order to make the sequences and the responses from the students more meaningful." This was evidenced by student B8 who responded: "On some of the questions I was able to answer straight away because we had talked about them in class."

In the next section, the effect of using the LAMS environment on teaching practice and strategies will be examined.

4. How does involvement in a collaborative learning online environment affect teaching practice and strategies?

Jackie found that when she analysed the chat sequences the level of thinking was quite low, mainly at the remembering and understanding stage. The children were stating their findings without probing into the reasons for their thinking or questioning the other students' thinking. Examples of this are:

> I think the worst photo was the cemetery. (A4)

> I thought cost was the most serious. (A7)

Jackie stated that she believed if the students spent more time with chat that their answers would have been fuller. She also saw that, in hindsight, more direct teaching of questioning would have been beneficial and would have helped foster higher-order thinking in the LAMS chat activities.

It is also important to ask open-ended questions where the students have to justify their thinking. An example of this is "Do you consider this to be an act of vandalism? Justify your answer." This pushed them into the applying, analysing, and evaluating spheres of Bloom's Taxonomy. As teachers, keeping the framework in mind when planning the sequences was important to ensure that students were challenged to think at a higher level. Jackie suggested that the most effective strategy for the promotion of higher-order thinking was the pre-teaching and discussion that happened before the students started each sequence. This meant the students had already discussed and thought about the issues and were able to express their ideas and opinions thoughtfully and with background knowledge.

No high-level computer skills are involved in typing/entering data/content into the LAMS activity tools but the process of developing quality content, including questions designed to elicit higher-order thinking and responses, requires quality thinking and planning time—time to think about which tool is the best one to use in terms of the learning outcomes. Caroline stated that when the three teachers planned the sequences, they asked themselves "What would work best for these type of activities?" On one occasion the teachers developed the beginning of a sequence which took them nigh on 30 minutes only to suddenly turn to each other in "one of those eureka moments" and say, "The Shared Resources and Forum tool would be better to achieve all of this than what we have done." They then restarted the sequence and felt they "had a better activity" as

the result of their discussion and "learning about the use of the tools". Anita indicated, "You really have to be specific. You've got to have your questions; you've got to know what you want them to do. I think it helps to keep them focused cause you've got your specific instructions there—what do you think of this or justify your reasons why." The ICT facilitator also noted that "developing the sequences [is] much easier and enjoyable with the discussion and exchange of ideas when working with someone else".

Initially, teachers predicted student difficulties would be confined to the lack of computer skills. The teachers identified the following issues on their first LAMS trial sequence:

> Having to be very specific about what you want them to do and how you want them [children] to do it. Things like—upper/lower case, how to get back into things if they want to make changes, step-by-step instructions of how to do tasks for those unfamiliar with programs (e.g. how to get into Word, how to copy and paste etc).

> May take a bit of practice.

> More practise to become familiar with the program.

> Organisation of the children and activities.

> Problems for me will mainly just be getting familiar with the program so I feel confident to deal with any 'hiccups' that may occur.

> For the children we will need to be very specific about what it is we want them to do and how they will do it. They will need to be more capable in typing skills and using the computer in general.

However, the main difficulty was not in the students' use of the program in terms of navigation and typing skills, but reading skills. The teachers were mindful of how much "content" was written in noticeboards, question, and answers and even in instructions when they developed sequences in an effort to reduce the amount of reading. Online reading of website resources proved difficult for some students and because the teachers involved in the project were experienced they were flexible in how lessons actually developed: "The article we used on the shared resources activity was quite difficult for the students to understand … in the end I printed this off and guided the students through it in small groups."

The teachers were also clear that this online environment may not be suitable for all students because of the amount of reading involved in the activities and children with strong literacy skills find it easier than those with less developed skills to communicate in this written way. No cultural or gender differences were noted by Jackie or Anita. However, Caroline found that the capabilities and developmental stage of the children were what influenced the higher-order thinking; gender and culture had little bearing other than for one child who had limited English.

Teaching strategies, as mentioned, changed to meet the needs of the students in this new learning environment. Caroline explained this need for change:

> The children were highly motivated when using the computers for learning tasks. Those needing reading, language, or typing help were given support from a buddy, so all were able to complete the sequences successfully. Due to the wide range of ability, any reading needed to be done as a class in a guided lesson in order for them to be of use in the related sequence. The LAMS environment was particularly attractive for children who disliked writing up information in their books and to those who were self-motivated when completing tasks as they could work at their own pace. The LAMS forum enabled children to express their ideas confidently, suiting the reserved child who has difficulty speaking in front of a group.

Teachers needed to be adaptable because of the newness of the environment they were working in. This flexibility was evident in forward thinking and backup plans. An example was when Jackie's class successfully completed a sequence using websites in the shared resources activity but when Caroline's class attempted the activity the resources had disappeared for no apparent reason (although the other activities within the sequence were complete). However, unfazed Jackie noted in her journal, "Luckily, I had copies for them to use."

As referred to previously, Anita chose to display the monitoring screen on the data projector, while the sequence was in progress, so students were aware she could see the comments being written. This strategy worked as an unexpected motivator for some students as in traditional teacher style Anita praised the students as she read their LAMS postings (while multi-tasking and wandering around helping individual students). An example was "What a really cool answer *[name given]*. You really had your thinking hat on." This had the effect that students sitting alongside the student praised scrolled to find *[name given]*'s answer, read it, and then added it to their original comments. Praise acted as a motivator for students to improve their answers.

Anita summed up the effect that using the LAMS environment had on teaching practices and strategies:

> LAMS is an environment that needs to be explored further as we found that the benefits to the learners definitely outweighed any challenges that we faced while conducting this study. We know that the best learning comes from each other and the LAMS setting allows us to immerse our children in such a way that is conducive to optimal teaching and learning for all.

5. What was the contribution of the technology to the teaching and learning experience?

The consensus of the teachers was that the technology made a positive contribution to the teaching and learning experience, despite the issues that have been discussed throughout this section. The conclusion about the contribution of the LAMS environment to the teaching and learning experience was included in each teacher's report on their action research and is presented below in the teacher's own words.

School A Teacher 1

Using the LAMS online learning environment provided another dimension for teaching the unit. The motivation and interest of the students remained high throughout as a result of the environment. The use of the system gave all students the freedom to express their ideas, which is often difficult in class discussions as some children cop out by saying that they agree with so and so. By using the LAMS environment all the children were required to respond and give their reasons for their thinking. The students who initially were less confident computer users quickly improved their skills and became very computer savvy. If I were asked to give advice to teachers who were going to use this environment, they need to surround themselves with people who can support them. The LAMS environment is still undergoing modifications, therefore they need to be prepared for changes! Plenty of time is needed to become familiar with the activities before beginning to design sequences. A clear purpose for each sequence is vital to ensure that the tasks remain meaningful. Previewing the sequences created before saving them is helpful. The more practice one has at writing sequences the better the sequences become, so do stick with it. Allow time for the class to try mini sequences to familiarise themselves with the environment, before launching into your main topic.

We only scratched the surface of this environment. Many of the tasks relied upon the student's literacy ability at the expense of creatively responding to things. It is possible to use this environment in a more creative way and exploring these options would be the next step.

School A Teacher 2

The LAMS environment has proven itself to be a very useful tool in the implementation of a unit when used in conjunction with the traditional teaching approach. Any reading passages included as part of a task need to be set at your lower reading levels, alternatives given for the different levels, or taken as a guided reading session in a group situation to ensure all children gain the understanding needed to complete the follow-up activity.

The children are highly motivated when using computers for their learning tasks and given support (if required) all are able to complete the sequences. The LAMS environment is particularly attractive for those who dislike writing up information in their books and for those who are very self-motivated when completing tasks because they can work at their own pace.

There was not a lot of evidence of higher-order thinking from the sequences my class completed, but in saying this they did not do the more in-depth tasks that came later on. Higher-order thinking was gained more through class and group discussions and the reflections made of the LAMS activities they had completed. The capabilities and developmental stage of the children influenced the thinking involved; gender and culture had little bearing other than for one child who had little English.

My class of Year 6 and Year 7 students have thoroughly enjoyed using LAMS and I would not hesitate in integrating it into units in the future.

School B Teacher

The LAMS program can be incorporated effectively within your teaching programme as another tool for the children to utilise. The program adds another dimension to the way in which the children can research, develop their thinking skills, share their findings, and gain new information. LAMS gives the children the opportunity to extend their thinking and find solutions to their questions.

As a teacher, the program allows you to monitor the children's progress on a regular basis and also analyse their responses to the questions asked and tasks set. LAMS gives you, the teacher, enough concrete material to help assess not only the children's prior knowledge but also their development and progress throughout the unit. Gaining access to the children's responses to the activities is easy to locate. You also have the added option of being able to print off any samples and examples you may require. I particularly liked this program because I could monitor closely the children's progress and if they weren't achieving or if they had particularly good responses then you could follow up one-on-one with the children. It's great for the children to also know that you can monitor their progress, which helps to keep them on-task.

As our learning and teaching continues to change it is our responsibility as teachers to continually seek out any opportunities to further enhance our curriculum delivery. It is up to us to experiment and explore the diverse range of learning tools and/or programmes that can allow our children to become the "***critical thinkers***" of today. The important thing to remember is that programs such as LAMS are merely a tool to be utilised within your teaching to achieve a common goal, outcome, and understanding. The best learning comes from each other and the LAMS environment allows us to share and learn from each other.

6. What did the teachers and students think of LAMS as an online collaborative learning tool?

Teachers and students were both motivated in the use of this environment. Although some of the comments presented are confined to the "specific design aspects of the LAMS program" they are deemed relevant to the discussion.

Teachers used two versions of LAMS—one for the initial trial sequences in 2004 and Version 1.0.1 for the online collaborative unit in 2005. Other versions have subsequently been released, but a decision not to move to these was made as no guarantee that the work completed (data for this project) could be viewed in the new version. At the time of our trial unfortunately a number of "bugs" were discovered as this version was still under development and this created dissatisfaction and a sense of frustration for both teachers and students:

> A minus of LAMS was when the computer got stuck and I couldn't get into the chat room [B12 referring to the opening of the chat session when for no apparent reason this 'froze' on opening; however other students around him/her were able to participate].

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Teachers described the use of authoring as "very easy to use" once "I got the hang of it". The author simply clicks on the appropriate activity tool on the left hand side and then drags it into the central pane. Additional tools are selected and then the transitions placed to link the activity into a "sequence".

There were plenty of initial frustrations and one worthy of note is that when the author is in preview mode they may identify an error, e.g. spelling, grammar, lack of flow, etc. and wish to return to author to edit it. However, preview mode is a linear process and you must complete the entire process (including answering each tool as a learner) before exiting and returning to authoring mode. This meant recording/remembering "errors" to correct at the end. It would, as Anita commented, be "much easier to correct as we go along".

Font size was also an issue. With the release of Version 1.0.1 early in the year, font size and colours could be selected for the noticeboard page only. This was a feature liked by the teachers because it "allows for some interest" but most importantly enabled "less strain on the eyes", when a larger font was selected. As some of the sequences involved lots of discussion and planning it was not unusual for the teachers to work for up to an hour in authoring mode. Our recommendation would be that this feature be rolled out to the majority of activity tools.

Unfortunately the biggest disadvantage for collaborative teaching is that only one teacher can view the monitoring screen and this is the person who "releases" the sequence. Usually this is the "author", however one of the teachers using a MAC platform was never able to solve why she could not release sequences at school. At first she was unaware this was even an issue as she had previously released the sequences from home, but on this particular day she attempted to do this from school. Unfortunately no one was available to assist her on site that day so she phoned the project director who released it but with the result she could not view the monitoring screen. When the teacher from School A released sequences for the combined class activities, the teacher from School B could not view her class's progress on monitor and vice versa. To ensure a collaborative class venture of this kind it is important for both teachers to view the monitor screens.

Another feature of LAMS endorsed by teachers and students alike was the opportunity to "see every body's responses to the questions" (B8). "You get to read what other people have said and then you can answer the questions" (A26). Anita said "It's really good because you can go back in and see their answers and you can check how they are going." Jackie also observed in a meeting "It was so handy to have everyone's responses visible…it was all collated and all there…you are not misinterpreting." The fact that the teacher could select the option to show the name of the student or remain anonymous was seen as "advantageous".

The students were well motivated when using LAMS. Motivation and engagement were defined by the team as "enthusiasm shown by the students and their willingness to remain focused on the tasks". Jackie observed:

The use of the LAMS program kept the children motivated and engaged. Each day they would come in before school and ask if there was a new sequence to complete. The class was a hive of activity as soon as they were allowed to enter the room at 8.30[am]. The official school day does not start until 9.00[am] but this did not appear to deter the students. It was almost as if they didn't perceive the LAMS task as work because it was on the computer and new and exciting.

In Anita's LAMS sessions her class was also observed to have an increased level of noise that could also be described as a "hive of activity". As Anita observed: "Like the excitement Jackie and I experienced when we learnt about the many facets of the LAMS program my observations of the children showed they were experiencing that same adrenalin rush as their confidence and skill level improved. The mere fact they were able to share their learning and opinions with people other than their own class was quite thrilling." On the other side of the coin their disappointment was extremely evident when for one technological hitch or another they were unable to converse and share our learning with School A. An example of this dissatisfaction was:

A minus is that we sometimes didn't get to chat with School A. (B2)

As indicated earlier, the monitoring option was seen by teachers to be a positive feature enabling them to track progress, see what individuals said, and analyse the information presented by the students. "I particularly liked this program because I could monitor closely the children's progress and if they weren't achieving or if they had particularly good responses then you could follow up one-on-one with the children. It's great for the children to also know that you can monitor their progress, which helps to keep them on-task" was Anita's view. However, in reality, the teachers had little time while classes were in progress to actually use this feature to its fullest advantage. "I haven't been able to monitor," said Jackie in a meeting, "I've been too busy fighting fires, the computers were down, I had to ring Pat [implications for the synchronous session] dealing with other students…."

From the students' perspective, they found using the LAMS environment a positive experience:

LAMS has very interesting activities and you can see every bodies responses to the questions. LAMS is a fun way to learn. (B8)

I like sharing my ideas and I think that you can learn more this way. (B19)

The LAMS activities and questions really get you thinking. (B20)

Two final pieces of evidence that the LAMS environment supported student motivation were the suggestions by student B11, "make the sessions one and a half hours instead of an hour" and by students B4 and B18, "more schools should be learning and be logged onto the LAMS program".

Summary

The teachers directly involved benefited professionally and personally in terms of their educational practice, understanding of learning within a new paradigm, and learning of technical ICT skills. In addition, their experiences were shared with other staff in Christchurch through

reporting or reports to staff or cluster meetings. The teachers were encouraged to contribute to the technology taster professional development sessions run at the South Learning Centre. As both students and teachers were involved in reflective practice, the transfer of the knowledge and understandings was evident within the electronic records and ongoing classroom activities that occurred alongside this online learning environment.

In summary, the main findings of our research project are:

- LAMS enables teachers to develop learning sequences using a variety of activity tools that all have the potential to contribute towards a collaborative learning environment. However, the quality of the learning environment was clearly affected by the teacher's development of the content and purpose of the activities chosen within a sequence.

- There are most definitely groups for whom this environment is more effective than others in relation to higher-order thinking skills as some students do not have the academic readiness to think beyond the lower levels. Also, reading and literacy skills determine how effective the LAMS environment is for some students.

- The critical success factors for students and teachers in developing and using a collaborative learning online unit of work are time, professional development, confidence and capability, access to computers, a support network, and effective teaching practices.

- In order to be able to provide a programme of work that fosters collaboration and caters for a wide variety of individual and collective needs of the students, teachers need to be flexible in their approach and utilise a wide range of strategies.

- Despite there being a number of issues to contend with, the contribution of the technology to the teaching and learning experience was seen as positive overall.

- The use of the LAMS environment was a source of motivation for both the teachers and students in fostering collaboration despite technical issues having to be overcome.

5. Limitations of the project

This research project was a small-scale case study involving three classes and therefore is not automatically generalisable to all primary schools. However, it should be noted that the classes in which the research project was conducted are in most demographic respects typical of classroom situations found in full primary schools.

Discussion at the team meetings identified the following barriers as having impacted on the research and the implementation of the LAMS environment for the classes:

- the regular availability/accessibility of equipment;

- bugs in the LAMS program;

- time to build relationships needs to be built into the time frame as there is a tension between the need to be in class and the time needed to work on the project with the team;

- lack of computer access and Internet connection at School B;

- change of principal at School B and change of staff involved in the project;

- timetable constraints;

- development of pre-trial units—the process was not able to go ahead because of the timeframe being changed due to the delay in setting up LAMS on the SLC network;

- the reality of classroom teaching—the trial was not long enough, even in the proposal;

- the new version of LAMS presented new learning and/or network implications for the schools;

- the IT support and time required impacted on teachers' time and the fluidity of the lessons;

- having to have a "Plan B" for the day in case of technical problems;

- the need to balance school and family commitments;

- lack of previous research training;

- lack of time as a team to work on the "nuts and bolts" of research; and

- training meetings tended to be used to establish relationships and design sequences rather than dealing with the mechanics of the LAMS system.

The research project was short-lived within School B as the teacher involved in the project (Anita) left and no one else was available to develop the program. In her interview, Anita expressed disappointment that the LAMS environment would not be continued within the school. In direct contrast, though, was one of the comments from School A: they were grateful that there were two

of them so they could support each other in the use of the LAMS environment. Work is being undertaken to address this issue by working directly with other staff at School B.

Timing issues

The time frame of the project meant it was limited in scope. This restriction was intended to sustain the teachers' interest and motivation as well as affected by the long-term planning for each of the schools. As the year's plans were designed around having a theme for each term, the teachers wanted to start the unit at the beginning of the term and have it completed by the end. This meant the time frame shifted from what was originally envisioned. A change in the personal circumstances of the teachers meant that this shift was non-negotiable. It also severely limited the time for trialling the use of the online environment. There were a number of technical difficulties, which meant the system was not available to the teachers at the right time and therefore they were not able to do "live" testing of the system until they began their unit.

Need for non-teaching assistance

Another difficulty was the demand on the teachers to both do the research and teach in the classroom. There was a definite need for the teachers to have someone else in the classroom to assist with student observations, as they were occupied in making sure the students were able to log onto the system, use the LAMS environment and access the sequences, and read and follow the activities. This meant that they were not always able to observe how the students interacted with the LAMS environment and each other. In order to mitigate this, the strategy used was to focus on five students only, rather than trying to record observations on the entire class.

In the initial proposal each teacher was to have an ICT facilitator available. However, the ICT facilitator at School A became a full-time classroom teacher and her class was used for the study. The teacher at School B had the support of an ICT facilitator, but having all the students online together, combined with the low reading levels of some students, meant that it was still difficult for the teacher and the facilitator to manage the class while conducting research on the five identified students.

LAMS sequences

When using the first sequence it became apparent that when a project is being shared across schools, only the teacher who "creates" the sequence can monitor it. Other staff cannot monitor the same class; they may only join it as a learner. The capacity for monitoring by more than one person may be included in a future release. The lack of this was a limitation of the software in the context of this research project.

A related issue was that, for some reason, releasing sequences at School A was problematic. To overcome this problem, the SLC manager released the sequence, which meant that neither teacher

could fully monitor their students' progress. Some of the measures used to overcome this problem were: printouts (hard copies) of the students' work on the sequences were made available; and shared logins and passwords so that everyone could access the areas of the program they needed.

Student motivation

The level of motivation of the students was determined by the professional judgement of the teacher, as opposed to having a data collection instrument specifically designed to measure motivation. The novelty factor of the experience needs to be taken into account, although observation of the class using the lab at the SLC suggested that there was a much higher level of engagement than during previous units they had done through SLC, such as GlobalNet projects. Whether this was due to the interest level of the topic for the students, or the novelty of working with students from another school, can only be guessed at. The amount of peer sharing and the excitement (noise) level that was observed when the students worked in the computer lab at SLC was the basis for this claim of a higher level of engagement.

Shift in focus

An interesting development in this project was the teachers' shift in focus, albeit with the best intentions, from concentrating on collaboration to turning more to the content of the unit of work. There was much discussion about the pedagogical approaches used and how the learning environment was affecting the teachers' planning and implementation of them, but less emphasis on this shift of focus. The management and the technical aspects of the project tended to overshadow the learning. We were basically the guinea pigs for the trialling of the LAMS environment for use in primary schools. Many of the stumbling blocks encountered were bugs in the program, which meant that the teachers had to focus more on the technical aspects of the project.

The project in relation to a New Zealand-wide trial of LAMS

At the time the vandalism unit of work was drawing to completion (June 2005), the Ministry of Education scoped and implemented a New Zealand-wide LAMS trial. The project director for this study was seconded to assist the Ministry of Education with its trial. The teachers in the trial were encouraged to develop and trial sequences. These were usually one-off activities relating to a lesson, topic, or homework task. What was clear in comparing this project with the Ministry of Education LAMS trial was that the teachers involved in this project were quite ambitious with their collaborative project, especially given the newness of the LAMS program, the varying literacy levels of the students, having to work with another teacher who was unknown to them, and the focus on the pairing of the two schools.

As there was no previous model to replicate, the project was started "from scratch". This was a significantly resource-intensive project. The amount of time, effort, and resources to enable

two/three classes to do one unit using LAMS was considerable. The questions "Are the learning gains significant enough?" and "Could the same results (except for IT skills) be generated in an off-line environment?" have to be asked. The project team does not believe the same results could have been achieved carrying out this unit offline as the sharing of information between the two schools meant that a different type of collaboration, for the teachers and the students, had to take place.

Despite the issues and limitations that impacted on the project, our team viewed the LAMS collaborative learning online unit of work as a success. This will be discussed further in the following section.

6. Conclusions and recommendations

Conclusions

With the rapid change and development of conditions and learning needs of students, teachers often find themselves in very unfamiliar situations about teaching and learning. The teacher is often being asked to develop skills in facilitating learning which bear no relationship to how they themselves were taught. This means that they need ongoing professional development and support to replace old strategies with ones that reflect the environment young people live in today.

The literature on professional support recognises the importance of teachers learning from each other (Howard, 1999). The development of sharing in a school community and the sense of belonging are growing topics in the literature on teacher professional development and support.

Before teaching students in an online environment, teachers need experience in being an online learner themselves, so that they are aware of what it is like for the learner and what support the students potentially need (Bender, 2003; Ko & Rossen, 2001). This was very evident in the amount of time spent showing and teaching the students to use the LAMS environment. The amount of time spent teaching how to use LAMS needs to be weighed up against giving the students enough information for them to explore and use the program independently. The teacher from School B used a data projector when first showing the students how to use the system. It is hard to know when the students have enough information to start and be able to be fairly independent in using a new program or environment.

The role of the teacher as moderator and facilitator is also important. One of the criticisms the participating teachers had was the quality of the chat/discussions at times. This is also related to the choice of LAMS activity. Whether the Chat tool was the most appropriate for the discussions is another dimension that needs to be investigated. The word "chat" itself has a more informal connotation and maybe this signalled to the students that it was more a social space than a formal space.

Just as in a face-to-face class, a variety of learning opportunities and activities is desirable when creating an online unit of work (Ko & Rossen, 2001). The use of multiple approaches and individual as well as group activities gave the students a range of contexts with which to engage with the material.

One successful aspect of this project was the creation of a "hybrid" class; that is, a mixture of face-to-face and online teaching and learning activities. The online environment allows those students who are reluctant to take part in a class discussion to have a say in a safe environment. They can take time to think over and formulate their answers before posting their response onto

the discussion area, as opposed to having to respond immediately in a face-to-face discussion (Ko & Rossen, 2001).

Ownership of the project by the teachers was nurtured by the project co-ordinator although there was a tension between the use of the LAMS environment versus the planning, writing, implementing, and evaluating of the programme of work. The use of LAMs was not fully reviewed as there was no direct feedback on a number of the activity tools. Chat was the only tool used across schools. LAMS needs to be evaluated as a tool, rather than just as the environment for delivering the programme of work.

It was essential to have social interaction between students before the actual lessons began. This allowed the students to have a sense of knowing the others in their group. Ko and Rossen (2001) state that the use of icebreaker activities is essential and fulfils two purposes—introducing the students to each other and giving them an opportunity to test out the system. Some of the students' concerns about what their peers wrote, and the teachers' concerns about the depth of their students' answers, might have been possible to be addressed had a trial LAMS unit taken place before the vandalism unit was begun.

While the ability level of the students was taken into account, the amount of distraction for a less capable student who had a teacher assistant to help with reading and typing meant that there was less focus on the answer given. The mechanics of using the LAMS environment (e.g., spelling a name correctly to log in) were the focus rather than the content of the session.

The teacher's online participation can take the form of encouraging comments, critical feedback, or bringing the participants back to the topic (Bender, 2003). The teachers did not participate in the online discussions and therefore were not able to redirect the discussion if necessary or question a student further to elicit deeper thinking. Also, there was no modelling of what was expected of the students in terms of posting answers to questions or participating in discussions.

Jackie's advice to others, of "having a sense of humour because things will go wrong and you will make mistakes along the way", reflects the attitude the teachers had throughout this project. This was essential in light of their experiences with the newness of LAMS and the diverse nature and needs of their students.

One of the highlights of the project was when the two classes got together at the end of the unit to have a "celebration of learning" and present their findings face to face. Both teachers and students commented that this was one of the highlights of the unit and allowed the students to meet other students they had got to know online. As both classes were situated in Christchurch, this avenue was open to them. The project authors recognise the fact that this situation is unusual for online learning and might not always be feasible.

Recommendations

If this Learning Activity Management System were to be used, we would recommend that:

- In planning for a research project of this nature, budget in for a researcher or another teacher to be in the classroom to record observations/interactions.

- There is a definite need to establish trials that are robust and rigorous before launching into the unit. The time frame the teachers wanted was to have the unit start on Week 1 of the term and finish at the end of the term, even though the trialling of the program had not been completed. Making sure that the program can be utilised as intended in the classroom environment and on available equipment is essential to ensure the smooth running of the unit.

- The use of scaffolding is an important aspect of working online. The modelling by the teacher allows the students to see the format and signals to them what the expectations are.

- In order to ensure that the discussion stays on topic or continues forward, it is essential that teachers take part in the discussion. Neither of the teachers participated in the discussions and therefore we are unable to ascertain whether this would have made a difference to the quality of the chat sessions.

- Allow time for social interaction for students to have a sense of knowing each other and feel they are able to share their responses openly.

- Giving students the opportunity to meet face to face to do their presentations at the end of the unit gives it an authentic context and purpose.

- Before starting such a collaboration, teachers need time to meet face to face or by telephone. This is essential to building relationships and ensuring a quality outcome.

- The participating students involved need to know the outcomes of the activity and/or unit.

- Regular access to Internet-capable computers or laptops is essential to ensure that the two classes have the opportunity to communicate online on a regular basis and for students to complete the online activity sequences.

- A buddy system for the ESOL or less able student is one way to ensure that all students gain success and feel comfortable in the LAMS environment (Collison et al., 2000; Draves, 2002; Ko & Rossen, 2001).

When managing the use of computers, it is highly advisable to have access to 8–10 (or more) computers at one time and to be in a teaching space that will accommodate the whole class. This enables the teacher to circulate among those using LAMS while at the same time teaching another part of the unit in a more traditional approach. Having four or five students trained to assist others with moving through the sequences is invaluable, as this allows the teacher to work with other students who require individual attention. To this end, a roster system for the use of computers worked very successfully, with children marking off their names when they had completed a

sequence so that the next child could start. This also helped the teacher to monitor who had completed tasks and how long the task took them.

Another recommendation we would make involves improvements to LAMS. Future versions should allow images to be included in Noticeboard and Q&A to "break the page of text and provide more interest". The children in Anita's class "became very good at expressing their thoughts and opinions to the point where they offered possible suggestions for the improvement of LAMS", including "brighter colour schemes, bigger text to make the activities easier to read, lots of pictures and visuals". School B children also suggested the idea of being able to log in with their first name as opposed to their last name to make it easier (in the first session some children had difficulty remembering which family name had been used, or got the spelling of long surnames confused, making access difficult and frustrating), to have a spell checker and to have a monitor in chat that automatically checks and erases txt abbreviations (teachers had requested students not to use texting abbreviations in responses other than chat).

The above recommendations reflect students' and teachers' views of using the LAMS environment for a collaborative online programme of work. The recommendations focus on teachers being able to utilise LAMS to foster collaboration, allow inclusion of all students in discussions around a topic or issue, and make the use of online environment manageable in a typical primary school classroom.

7. Building capability and capacity

The members of the project team are provided in Section 3.

Principle Six of the Teaching and Learning Research Initiative states: "The research projects within the TLRI will be undertaken as a partnership between researchers and practitioners."

At our final project team meeting, we reflected on the journey we had all taken as part of this research project. The teachers had not previously undertaken online classroom work or researched their own teaching practices. To combine these two unknowns was a testament to the enthusiasm of the teachers involved and their willingness to add variety to their classroom practices. The benefits of online discussions and collaborative learning were themes that were consistently discussed at team meetings. The reactions, abilities, and needs of the students in the classes were the driving force behind the unit.

The project gave opportunities for the teachers to reflect upon their classroom practices and be supported in adding variety to their programmes and expanding their ICT capabilities. In terms of professional development, this project was a huge learning curve for all the teachers involved, but also gave them a glimpse of what is possible with utilising an online learning activity management system in their classroom programme.

A key aim of the TLRI is to build capacity and capability. The areas in which the project made a difference were: teachers becoming more reflective practitioners; teachers being stimulated to collaborate to develop a unit of work; teachers wanting to develop further skills in online learning activity management systems; and teachers developing action research skills.

Becoming more reflective practitioners

The teachers utilised their findings to improve subsequent teaching episodes through working within the action research cycle. This cycle of "think, plan, act, and evaluate" gave the teachers a framework in which to evaluate their teaching practices. By keeping a research journal, the teachers were able to look back on their own growth as the unit of work and project progressed. The opportunities to discuss the unit and any issues with using the LAMS environment and teaching episodes with another teacher who was undergoing a similar experience allowed the teachers to really reflect on their teaching practices, receive constructive feedback, and use this information to inform subsequent teaching episodes or the planning of online activities.

Interest and collaboration

The schools had students from similar socioeconomic backgrounds. Although the teachers used different teaching strategies or methods, they were both using inquiry learning as the basis of their classroom programmes. Even though the schools were the same decile rating, the abilities and needs of the classes were diverse. There was much discussion about how to meet the individual and collective needs of classes which resulted in the cross fertilisation of ideas between the teachers. The unit of work was collaboratively developed but allowed the teachers to tailor the face-to-face content to suit their individual classes.

Teachers developing as action researchers

This project offered opportunities for the teachers to undertake research in their own classrooms and develop skills in action research. They had the support of researchers to devise their research project and data collection methods, write up the research for reporting purposes, and disseminate their findings. The teachers were taken through the whole research process. They were involved in the project from very early on, so that they felt a sense of ownership of the project.

Further development of ICT skills

As well as developing their research skills, the teachers were able to further develop their ICT skills. Not only did they need to learn how to use the tools and functions of a learning activity management system program, they also learnt a variety of skills in basic computer operation, file management, and use of the Internet.

The research project also gave the research team an opportunity to "deepen researchers' understanding of teaching and learning by engaging with teachers".

Through the different phases of the project, there were opportunities for the researchers to be able to work with teachers in the development of teaching activities to be able to achieve the desired student learning outcomes. Opportunities to engage in discussion about the teaching and learning programme were also present. The researchers were able to view the students' responses to the LAMS sequences and see how activities evolve from development to the implementation stage.

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Appendix A: Unit plan—Vexing Vandals

Desired learning outcomes

The students will:

- develop an understanding of what vandalism is;

- outline reasons why people vandalise;

- demonstrate an understanding of why certain areas/communities are more prone to vandalism;

- outline the effect of vandalism to the school and the community; and

- develop an action plan to assist in the reduction of vandalism in the school community.

Learning tasks

Week 1—"Pre-test"

Classroom activities

LAMS asynchronous

Pre-test concept for use of LAMS. Gather data on what students already know and understand about the topic/issue.

Sequence:

Noticeboard

Q&A—What is vandalism?

Polling—Types of vandalism

Multichoice—Types of vandalism you have been a victim of

Q&A—Why?

Q&A—Consequences

Q&A—Feelings

Extension activity ideas: Why do people vandalise? Possibility of polling other people in the community later to prove/disprove ideas.

Week 2—What is vandalism?

Classroom activities

Activities to set the scene: picture activities; thoughts and feelings associated with vandalism; key words and definitions written and shared by students from each of the schools; common themes.

Comment

We examined nine vandalism pictures and the students had to decide which one they thought was the worst type of vandalism and why. This provoked a great deal of interesting discussion among the students and several of them shared their own personal experiences that related to the photos. The class was very empathetic to the plight of the people who were victims of the vandalism. They then had to write an article about the act as if they were a reporter for a newspaper.

LAMS synchronous

Using Chat

Meet and greet online. Work as individuals to meet the School B students.

Introduce yourself: two things about you; two things you would like to know about the other person. Introduce your school: two things about your school; two things you would like to know about the other school.

Comment

This was manic to say the least, as all of the School B students were online with eight of my students. The messages came in at a rapid rate of knots and it was near impossible to figure out who was chatting to whom. The students thought it was so cool, but we teachers made the executive decision to only have eight people from School B online with eight School A students in the future.

Sequence

Noticeboard

Notebook—What is vandalism?

Notebook—What is a vandal?

Share resources—Read online info and summarise the key points in your journal.

Notebook—Write your ultimate definition of a vandal/vandalism.

Week 3—Focus on history and effects of vandalism

1. In pairs, half of the class to read the article "The battle against vandals" from *The Press,* 19 Feb 2005 and the other half the article from *The New Strait Times*. Using dot jot skills, outline the main points. As a class, share the findings.

2. Keep a diary record each Monday of any rubbish found or acts of vandalism that have occurred in the school. The information can be graphed and data used to compare with School B.

LAMS synchronous

Sequence

Noticeboard: Where did the term vandalism originate from?

Share resources: Hone Heke photo

One Tree Hill article

Forum: In your opinion is Hone Heke committing an act of vandalism? Justify your opinion.

Do you consider the chopping down of the tree on One Tree Hill an act of vandalism? Justify your answer.

What would you have done if you had caught the people who damaged the tree?

M.C. & Notebook: Vote for the photo that you consider is the worst type of vandalism.

Why did you choose that one?

Week 4—Consequences

Classroom activities

1. Examine the photos and using the think/pair/share strategy identify the consequences of vandalism and share these with the class. Record these on a cross-classification chart, with the numbered photos across the top and the consequences down the side. In pairs, the students must rank the consequences for each photo from most serious to least serious.

    Comment

    This activity proved difficult because we had listed too many consequences and it got confusing. Next time I would definitely make sure that I limited these to five maximum.

2. Who cares? Dramatise the situations given in Appendix 1. Share these with the class. The students then list all the people involved in the situation and describe how they would feel, by writing a speech bubble for each. Present findings as a poster.

    Comment

    This activity helped the students examine the effects of vandalism from all angles. They loved making up the skits and sharing these.

3. Penalties: Appendices 2 and 3. Read the penalties sheet as a class and discuss any unfamiliar terms. In pairs, the students match the penalty with the offence and as a whole class share the findings and reach agreement.

    Comment

    This provoked much debate and discussion as some students thought that the penalties needed to be more severe.

LAMS asynchronous

Noticeboard

M.C.:	What do you consider to be the worst type of vandalism?
Notebook:	What do you think might happen because of this vandalism?
Q&A + Notebook:	Do you think the people responsible would behave the same if they knew the consequences?
	Explain your answer.
Q&A:	Which consequence was ranked most serious the most? Why?
Q&A:	What do you think should happen to people who light fires?
	What should happen to people who deliberately smash windows?
	What should happen to taggers?

Noticeboard

LAMS synchronous

Noticeboard

Chat:	Share with your partner the photo that you thought was the worst type of vandalism and why you thought this.
	List the types of vandalism that have occurred at your school this term. Let your buddy know how you feel about your school being vandalised.

What do you think the consequences should be if someone is caught vandalising property?

Weeks 5 and 6—Focus on fieldwork and the issues associated with vandalism

Classroom activities

1. Fieldtrips out and about. In groups of four, students visit a part of town. Each area will include shops and residential housing. They must predict before their visit what they expect to find and how long they think it will take before they find any evidence of vandalism. They can take photographs of their findings. We will then use the different findings to compare the neighbourhoods, using t-charts. The students can then identify problem areas and suggest reasons for this.

   Comment

   The class really loved the fieldtrip and it had a huge impact on the subsequent class sessions. The students used the information they collected to identify problems and come up with their own solutions to these. It also provided them with ideas for their own action plans.

2. Use the photos taken on the trips to design their own photo montage. Reflect on the trip, state the types of vandalism they found, and decide on the steps they would take to reduce these.

3. Read the picture book *The Conquerors*, without sharing the pictures. The students draw their favourite part of the story. They must decide if they perceive the actions of the characters to be vandalism or not and give their reasons for their thinking.

LAMS asynchronous

Noticeboard

Q&A: Would you expect to find the same amounts of vandalism in all areas of the city? Why/why not?

Voting + Notebook: How long do you think it will take to find an example of vandalism in your area? Tick one of the following.

Q&A: List the types of vandalism that you found. You may like to record the amount of each that you saw.

Voting + Notebook: Record the time it took you to find examples of vandalism.

Forum: We would like you to share your thinking with others about your findings.

Noticeboard

Weeks 7–9—Focus on development of plan of action

Classroom activities

1. Choose an area that they are interested in and design an action plan for this (in groups of three or less). Present findings in any way you choose.

   Comment

   One group chose to present what they found out on their trips. Three groups chose a problem that they had identified and came up with solutions for this. The other group investigated the amount of vandalism that school had to fix this year and the cost of this. They then worked out what the school could've done with the money instead.

LAMS asynchronous

Noticeboard

Chat: Share with your buddy two or three things that you learnt while doing this unit.

             Which part of the unit did you enjoy the most? Explain your answer.

2. Presentation of group action plans to the class.

Week 10—Celebration

6 July, School A

Two presentations from each school.

Books

The Conquerors, by David McKee.

The Skin I'm In, by Sharon G. Flake (Shared novel. This was read and discussed throughout the unit.)

It Comes Naturally, by David Hill. (A shared novel that had been read to the class the previous term. We reflected on the actions of the characters in line with our topic.)

Law Related Education Programme: Vandalism Unit

Appendix B: Consent letter

22 March 2005

Dear Parent,

LAMS Online Learning Project Information sheet for parents

School A Primary School and School B Primary School have agreed to participate in an Online Learning project during terms two and three of 2005. This is an exciting initiative that will involve students from both schools working together to investigate the theme Vandalism. Each school will have one Year six/seven class paired with students from the other school during the project so they can share ideas and discuss opinions about their topic.

This project has been funded through a Teaching and Learning Research Initiative contract. Both schools will work with the South Learning Centre who will host the online software (LAMS) and provide training and support staff, and CORE Education Ltd who will provide assistance with research ethics and practice to ensure our research is professionally managed.

During this time our aim is to see how a collaborative online environment affects learning and teaching from both the students and teachers' perspectives. This will involve students and teachers in evaluating the activities and discussing their learning with each other and other people. No personal details e.g. students names will be used in the report findings.

Thank you for taking the time to read this information. If you have any questions, please do not hesitate to contact your child's teacher at school or myself on

941 5142 or pat.street@ccc.govt.nz

Yours faithfully

Patsy-Ann Street
Manager South Learning Centre

Consent Form

I have read the information provided. I give permission for my child, _____, to be involved in the forthcoming Vandalism unit which will be used as part of a Teaching and Learning Research Initiative.

Signed: _____   Full Name: _____

Date:

Appendix C: Action research questions

Action research questions—case study teachers

Collaboration

Quality collaboration as defined by our team means sharing ideas, working together, and reaching a common understanding.

What do I do to foster quality collaboration between learners in the two schools in the LAMS context?

Jackie: To foster quality collaboration between learners in the two schools in the LAMS context planning together was vital. We not only planned the unit together, but we met and developed the sequences, always keeping in mind our class and their needs. This enabled us to also plan the learning that had to precede the LAMS sequence and make any adjustments to the next learning tasks. We negotiated times that were convenient for us both to complete our chat sessions. This was the only tool we used to collaborate between the classes.

Caroline: Whilst my class did not collaborate in the online environment other collaboration did take place. This took the form of children helping each other with the use of the LAMS program. They assisted with problems such as logging on, connecting onto LAMS links, explaining how to move around within sequences, how to edit sequences, and getting onto links for background reading. My class did not do any collaboration with the other school.

Anita: To foster quality collaboration between the learners in the two schools we needed to ensure that the teachers involved were clear on the lessons to be carried out each week. Extensive planning was needed in order to fully understand what was required out of each lesson, both in the class and online, in order to successfully complete our sequence of activities. Due to the limitation of access to computers we found that the children needed to be online at a specific time each week in order to share their findings from the previous week and get immediate feedback. This we managed to factor into our weekly programme.

What were the most and least effective strategies in fostering collaboration?

Jackie: The most effective strategy in fostering collaboration between the two schools in my opinion was the chance to plan together. Anita, Caroline, and I were able to bounce ideas around and develop sequences that supported our class activities.

Anita: The management for the "chat" activity was very evident after a disastrous first session. We found that having all of the children in the "chat" room at once was extremely difficult to manage and monitor effectively. We decided that smaller groups (of 8) were much more realistic, manageable, and beneficial for both the children and the teachers as the children could respond effectively to the online discussions. It certainly made monitoring the children and their work easier to follow and ensured that at least some of the children Chatting were actually on-task and completing the activity set.

Does the nature of collaboration change over time?

Jackie: The nature of the collaboration did change over time as Anita and I got to know each other. Our confidence with the program grew and the quality of our sequences improved.

Anita: The "nature" of the collaboration did change over time. As we, the teachers, developed more of a relationship:

- we become more confident in using the LAMS program and its many possible activity sequences; and
- we completed more of the unit and became more specific in what we wanted our children to gain and achieve from each lesson.

All of the factors outlined above certainly allowed us to develop our skills in this type of learning environment and provide the children with activities that not only challenged and excited them but also provided them with another tool to extend and share their learning.

Are there particular groups for whom this collaborative environment is more effective than others, e.g. gender, culture, and learning style?

Jackie: I believe that there are groups for whom this collaborative environment is more effective than others. Children with strong literacy skills find it easier than those with less-developed skills to communicate in this written way. I did not observe any cultural or gender differences, as all my class enjoyed this. This was evident in their PMI reflections comments.

Motivation and engagement

Motivation and engagement, as defined by the team, means the enthusiasm shown by the students and their willingness to remain focused on the tasks.

What is it that is motivating/non-motivating using the LAMS environment?

Jackie: The use of the LAMS program kept the children motivated and engaged. Each day they would come in before school and ask if there was a new sequence to complete. The class was a hive of activity as soon as they were allowed to enter the room at 8.30. The official school day does not start until 9.00, but this didn't seem to deter the students. It was almost as if they didn't perceive the LAMS task as work because it was on the computer, new, and exciting.

Caroline: All the children were excited about using the LAMS environment, especially as it was a different approach to a topic they had not experienced before. They commented that they enjoyed reading other people's postings before adding their own. The children also enjoyed clicking on the boxes to show an activity had been completed.

One child commented that he felt much more comfortable saying things in the LAMS environment "because he gets embarrassed if he says it in class". Some were a bit apprehensive at first about using the computers, as they had not had much experience with them and were worried about their spelling and so forth, but once it was explained that we were not worried about spelling most felt much better. One non-motivating part was the wait time to get on the computer. Children at the lower end of the roster had to wait quite a while for their turn due to only a small number being able to be on at one time.

Anita: The mere fact that they had the opportunity to share their learning and opinions with people other than their own class was quite thrilling. I do believe that the sharing component the LAMS environment allows you to take part in online is one of the key advantages this program has to offer. Many of the children's responses to the LAMS program when asked to complete a PMI (Plus/Minus/Interesting) chart about this learning tool highlighted their enthusiasm in sharing with another school.

Does the nature of students' motivation/engagement change over time? Why or why not?

Jackie: As both our schools experience the effects of vandalism on a regular basis, this was a very high interest topic for them and it certainly helped motivate the students. Many of my class

commented that they were more aware of the vandalism they saw in the community and they formed quite strong views on the subject.

Caroline: The motivation to use LAMS did become higher as we progressed. All the children were eager for the next sequence once they had completed the first. This excitement did cause some frustration when they had to wait quite some time before they could do so.

Anita: I feel that the motivation of the children did change significantly during the 10 weeks of this unit. The enthusiasm of the children was always very positive but this attitude just grew and grew as their confidence with the program developed.

Are there particular groups for whom this environment is more motivating/engaging than others, e.g. gender, culture, and learning style?

Caroline: No discrepancies between gender and culture were noticeable in relation to motivation and engagement using LAMS.

This environment lent itself very well to those who were not confident participants in class discussions. These children felt much more comfortable posting their thoughts on the computer rather than putting their hand up in class. They were able to have thinking time before they answered and to look at what other children before them had said. It also gave an opportunity for every child to have their say about the same question, rather than just a few, so all were engaged. The reluctant workers were very motivated by the computer and the LAMS program, particularly the children who dislike writing up information in their books.

Children who had limited English or very low reading ages found this environment difficult as it involved a lot of reading. This did not, however, lessen their enthusiasm to actually do the sequences—they did not want to miss out. The buddy system alleviated the reading problem to a certain extent but they still could not complete the tasks unaided.

Management

What do I do to manage student access to computers so it is fair to all?

Jackie: To manage student access to computers so it was fair to all, I operated a system where the students chose when they completed tasks during the day. Once a task was completed they ticked

it off on a chart. This ensured that the computers were being used for the majority of the time and the students were able to complete tasks when it suited them and when the computers were free.

Caroline: Due to the fact that the children could only work on computers in small groups, a roster system was set up to ensure all children had a turn to complete the sequences. The more able children were first so they could assist others when required once they had finished the sequence.

Anita: In order to resolve the issue of limited computer access for our school we were very fortunate to have the Southland Learning Centre to assist with this rather major dilemma. Between the two schools we managed to find a set time each week in our busy schedules to allow both classes to be online at the same time. Once we had established a set time then a permanent booking could be made through the Southland Learning Centre.

What class management strategies were the most and least effective?

Jackie: I found this system to be extremely useful as it allowed the students from the neighbouring class to use the computers when they were available. The students who completed the sequences first were also very helpful if subsequent students struck problems. The "Each One Teach One" philosophy was alive and well in our room. We were also fortunate enough to have eight computers in our room.

Caroline: The roster was an effective way of ensuring all children had their turn. Difficulties arose when children were halfway through sequences one day and then absent from school during the next session so close monitoring of the roster was necessary. In hindsight, organising a "classroom swap" perhaps two afternoons a week would have meant more children could have been on the computers at one time and I could have given much more assistance, making the completion of sequences quicker.

Anita: As one of the issues that arose was the difficulty in monitoring the children when they all went into "Chat" at the same time, a rotational time slot was allotted to each group of children. The magic number of eight per group was selected as Jackie's class had the capacity to have up to eight children online at any given time. This strategy proved to be so much more manageable than our previous attempt of whole-class "chat".

Are there particular groups for whom these strategies are more effective than others, e.g. gender, culture, and learning style?

Jackie: I believe that there are groups for whom this strategy is more effective. Those in my class are well-motivated, independent learners who are able to manage their own learning time effectively and love the autonomy of managing their own time.

Caroline: The roster and individual use of the computers worked better for those who were self-motivated and those who were particular about checking tasks. Some children took a lot longer to finish the sequences than necessary, whilst others clicked through the background information texts without actually reading them. Some of the latter children had not read the instructions for the task carefully and others could not understand the readings so gave up. (These readings were later done as a full-class lesson with printed copies.)

Anita: While we had eight children in the "chat room" the remainder of the class was able to work through the other LAMS sequence activities that had been set up at our planning meetings. This allowed the children to work at their own pace in order to complete the set tasks and also keep the children focused. It also gives them the opportunity to finish any other incomplete sequences from previous weeks.

Thinking

What are the various levels of thinking (Bloom's Taxonomy) that are observable in the interactions and were these appropriate to our thinking goals?

Jackie: Various levels of thinking (Bloom's Taxonomy) were evident in the student responses. Some questions were at the lower level that required an answer only, while others were at the higher levels and the students had to justify their thinking. Examples of this higher-order thinker are:

> I think it is an act of vandalism, because the flag isn't his. (A23)
>
> No, I don't think it was vandalism, because he was protesting. (A17)
>
> Yes, because it was willful destruction of property. (A20)
>
> Well almost everything surprised me. I thought that there would not be very many examples of graffiti, but it turned out to be graffiti central! What surprised me the most was to see how this really effects things, cos the dairy had been shut down and that all the things were mainly just tagging. It also surprised me that um someone had tried to tag over a STOP sign and that would be extremely dangerous at night, cos no one would be able to see the sign and that made me think because this guy has tried to do this and someone could loose their

life just because of this. The amount of graffiti that we found amazed and shocked me. (A13)

When I analysed the chat sequences I found that the level of thinking was quite low, mainly at the remembering and understanding stage. The children were stating their findings without probing into the reasons for their thinking or questioning the other students' thinking. Examples of this are:

I think the worst photo was the cemetery (A4)

I thought cost was the most serious (A7)

I believe that if they spent more time with chat this would've improved. More direct teaching of questioning would've been beneficial in hindsight. This would've helped foster higher-order thinking in the LAMS chat activities.

Caroline: My class did not participate in the online chats. There was much discussion amongst themselves about graffiti, tagging, and what is deemed to be vandalism. These discussions showed some higher-order thinking in that children had to justify their opinions and were able to challenge the opinions of others.

Anita: Using LAMS as part of a unit certainly did enhance and promote a more sophisticated level of thinking. We were able to do this effectively through first selecting a topic that was of "high interest" and would engage the children. Vandalism was certainly a topic with which the children could relate to, as it could be found in and around a number of communities within Christchurch and it was also a topic that allowed the children numerous opportunities to express their thoughts, ideas, and opinions. They also developed their ability to justify their points of view whilst accepting that other people may have a differing viewpoint to their own.

What are the ways in which we can foster higher-order thinking in the activities used on LAMS?

Jackie: To foster higher-order thinking in the LAMS activities it is important to ask open-ended questions where the students have to justify their thinking. An example of this is "Do you consider this to be an act of vandalism? Justify your answer." This pushed them into the applying, analysing, and evaluating spheres of Bloom's Taxonomy. As teachers, keeping the framework in mind when we were planning the sequences was important to ensure that we were challenging our students to think at the higher end.

Caroline: One thing I found with the activities on LAMS that my children completed was that the instructions needed to be clearly and simply stated in order for them to be carried out as they were intended. When justifying answers they had given, many just repeated what someone else had said before them, rather than thinking it through themselves. This, in turn, decreased the higher-order thinking involved with the task, rather defeating its purpose. It also meant that if someone in the first group doing the sequence misinterpreted the question and wrote in a response accordingly then many others went down that same track after reading the responses. Using a "reflective questions" sheet gave the children a starting point for their thinking, ensuring they went beyond the obvious when responding to a task sequence and requiring deeper thought.

Anita: The children were able to work from their prior knowledge of vandalism and then devise a 'big' question, which allowed them to seek out answers as to the reasons "why" people commit such acts and for what purpose.

What are the most and least effective strategies for the promotion of higher-order thinking skills?

Jackie: I believe the most effective strategy for the promotion of higher-order thinking was the pre-teaching and discussion that happened before we started each sequence. This meant the students had already discussed and thought about the issues and were able to express their ideas and opinions thoughtfully and with background knowledge.

Are there particular groups for whom this environment is more effective than others in relation to higher-order thinking skills, e.g. gender, culture, and learning style?

Jackie: There are most definitely groups for whom this environment is more effective than others in relation to higher-order thinking skills, as some students do not have the academic readiness to think beyond the lower levels.

Caroline: The LAMS environment in relation to higher-order thinking was more effective for the more able student. Culture and gender had little bearing; it came down to the individual children's capabilities and developmental stage of thinking. Learning style did make a subtle difference in that some children were able to respond better orally, finding it more difficult to record their thoughts on paper. On the other hand, the children who are shy about expressing ideas in an oral discussion enjoyed recording answers for others to view.

Anita: This online learning program is very effective for those children who enjoy working independently but still allows them to share their ideas with their peers when the occasion warrants interaction. It also challenges them to think about an issue in a variety of ways and realise that there isn't just one right answer but, rather, a multitude of possible strategies and solutions to work through a suggested problem, BIG question, or issue.

Action research questions—facilitator

The facilitator also looked at her practice through a reflective lens in order to be able to better understand her practices/strategies used in assisting the teacher to use the LAMS environment. The questions that shaped her reflections were different from those of the teachers.

What kind of strategies do facilitators use to help/support teachers using LAMS in the classroom?

The strategies used were:

- group discussions with a leader;
- teacher–teacher planning together;
- discussions and support with a support person (facilitator); and
- working in the classroom with the teacher.

Which strategies were the most and least helpful?

From my observations I concluded that a combination of all the strategies was needed to give teachers the support and confidence to include new learning strategies for facilitating student learning in their repertoire. The support and confidence gained by a teacher working with another teacher using the same resources and theme in planning for learning experiences in the classroom was evident by the obvious enthusiasm with which they approached the task. An outside support person was most useful in discussing the issues for the particular class. In the whole-group discussions the classroom teachers discussed the way LAMS was to be used within the unit of work and issues related to the research activities.

At what points do the teachers become independent in their use of the LAMS environment?

The teacher I had been observing and working with appeared to reach some degree of independence when she was able to structure a series of activities on the LAMS environment independently. However, she appeared to find the developing of the sequences much easier and more enjoyable with the discussion and exchange of ideas when working with someone else. The

teachers concerned were enthusiastic for the project, wanted to be involved, and were open to new ideas that I think were factors to learning a new strategy for learning such as LAMS.

The sharing of the technical difficulties which happened early in the project and the frustrations of these dissipated the negative feelings and gave the teachers the support necessary to keep them from giving up. It was also supportive for the teachers to know that good technical support was near at all times.