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Introduction

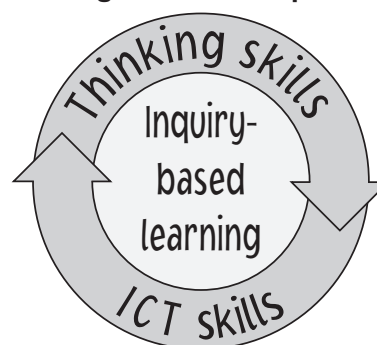
In today's staffroom, discussions about pedagogy invariably involve topics such as thinking skills, inquiry-based learning, visual literacy, outcomes-based education and student engagement, and the integration of information and computer technology (ICT) skills. *Lift Off to Learning* brings together all of these elements in a practical approach to teaching and learning that is increasingly relevant to Australian classrooms.

The pressure on schools to keep up with advances in technology, and to use this expensive technology effectively, comes from all directions – from education departments to teachers to parents to the students themselves. In the future, students of all ages are destined to invest more and more time in front of computers. It is our responsibility as educators to make sure that students get the most possible benefit from that investment. This means ensuring students are well versed in the use of the tool itself, are capable of discerning the value of what they see on screen and can make practical use of material accessed through electronic media.

Educators should strive to create students who know and understand both the power and limitations of electronic technology and who are truly information literate. To be information literate means that students are not overwhelmed by the sheer quantity of information that is instantly available via electronic technology, but rather can sieve for relevant and reliable information, and use it to produce outcomes with personal meaning. Computer literacy therefore is not simply the ability to navigate the technology itself, but a step along the path to creating information literate students, and that should be our primary goal.

The use of computers and other electronic technology in classrooms should reflect two sides of the same coin. On the one side, computers have the capacity to enhance the thinking skills of students; students should be able to think better as a result of time spent in front of a computer screen. On the flip side, they should be able to apply their higher order thinking skills to make best use of the technology.

Thinking enhances computer use ...



... and computer use enhances thinking.

Lift Off to Learning describes an inquiry-based approach to information literacy, using ICT skills and a wide range of thinking tools. The book includes real-life examples from all stages of the program that have been put into practice at a Melbourne school.



***Lift Off to Learning* CD-ROM**

The CD-ROM that accompanies this book features pro forma worksheets for the thinking tools used in the program, as well as several real-life examples of student end products.



How do we involve students in meaningful brainstorming activities?

While brainstorming, students should be encouraged to draw upon all sources of information available to them. These sources will include data collected during the first stage of the inquiry, so all students should be able to contribute some knowledge at this stage. There are many ways to engage students in brainstorming, and several techniques are outlined later in this section. Brainstorming may be a private or shared activity (individual, small group or whole class). For shared brainstorming sessions, Pohl (1995) suggests that teachers first try a whole class session without any rules of conduct, and then negotiate a set of rules with the students, such as 'No talking while someone else is talking' or 'Wait until your name is called before you speak' (see L.A.C.E. – Rules for brainstorming, below). Making sure the whole class (and teacher!) sticks to these agreed rules encourages risk-taking and maximises involvement for everyone.

L.A.C.E. – Rules for brainstorming

L = Lots of ideas wanted (so piggybacking on ideas is okay)

A = All responses recorded (ideas are judged later)

C = Criticism is not allowed (of people or ideas)

E = Encourage way-out ideas (it might produce a better solution in the end)

Brainstorming is an effective way of establishing previous knowledge. It may be as simple as engaging students in small group or class sharing and asking them, 'What do you know about this ... ?'.

It may involve students in starting personal, group or whole-class records of learning – the KWHL chart being a common example of such a record (see page 36 for an explanation and other examples).

What tools support teaching and learning at this stage?

Convergent and divergent thinking with extended brainstorming

When students brainstorm beyond fluency they experience a series of learning processes that see them continually shifting from convergent to divergent thought processes (see the Extended brainstorming table on page 34, based on Williams, 1970).



Inspiration

Inspiration software is an extremely powerful learning tool within the inquiry process. In the Brainstorming stage, we can use *Inspiration* to build basic concept maps as well as linking other tools to the process. We can direct the students to think in a range of different ways using the graphic interface within the program.

In the Brainstorming stage, *Inspiration* Version 7 can be used to:

- build basic concept maps
- arrange the diagram in various ways
- build thinking libraries (see below)
- add notes behind each idea on a concept map
- make hyperlinks to other documents and the Internet
- add sound to each idea on the concept map
- convert the concept map into a *Word* document
- export the concept map as HTML
- export the concept map as a GIF (an image file) for *Word* or the Internet.



The CD-ROM that accompanies this book also provides step-by-step instructions for building your own 'Thinking libraries' within *Inspiration* as well as a range of graphics to use. By building libraries which link to thinking tools such as Directed Thinking, KWHL, PMI and SWOT, student brainstorms can be guided from fact gathering to the sorting out and analysing processes.

Some distinct advantages of creating and arranging brainstorms using *Inspiration* rather than relying solely on hard copy versions are:

- Information can be sorted, classified and changed easily and quickly.
- Ideas can be added and removed.
- Notes can be created behind each idea allowing students to elaborate on their original brainstorm.
- Sound and graphics can be added.
- Digital photographs, graphics, animations and movies can be imported.
- Hyperlinks can be made linking each idea to other documents or the Internet.

If desired, *Inspiration* can be used as a presentation tool or as the structure for students to develop digital portfolios, as is the case at Apollo Parkways Primary School.

A free 30-day trial of *Inspiration* can be downloaded from the Internet at <www.inspiration.com>.



Create it!

Why should students create products?

- To introduce learning technologies appropriate to this stage
- To display the products of the inquiry
- To demonstrate presentation skills
- To demonstrate students' ability to apply the introduced learning technologies within the context of their own inquiry.

What is the role of the classroom teacher?

At the creating stage of the inquiry, the teacher has a role in assisting students' decision-making processes. Some of the questions to be dealt with at this point include:

- From the information collected, what should be accepted and what should be rejected?
- How can I best structure this information for an audience?
- What choices are there for presenting the information?
- How can the computer and other information literacy tools assist in creating the final product?

At this point, teachers need to consider the role of student choice in selecting product format. The most pertinent issue for teachers is how much freedom students should be offered when choosing how to present the information they have gathered. The answer to some degree lies within the specific nature of the inquiry itself and within the previous experience of the students. Generally, however, students will tend to choose from what they know rather than explore the unknown.

As a result, the classroom teacher may need to assist students in expanding upon their existing repertoire by introducing new and different mediums of expression. For example, students who would normally opt for traditional paper and pen assignments may be encouraged to select technology and the animation process as tools to demonstrate their learning. This selection would introduce this technology to students within a real-life context, i.e. animation becomes a tool to demonstrate learning rather than a tool to 'do animation'. The technology develops real significance within the curriculum; the process of animation becomes an integral part of the learning process and the skills of the students are expanded, increasing choices at a later stage.