Teaching Tips for Technology Skills

The ability to use technology effectively is highly valued by employers. Effective technology use includes using technologies to:

* access and filter data;
* extract and integrate information for learning; and
* interact, collaborate and create online.

Many students today have high skill levels in the technical use of technologies. The challenge is how to help them use their technical capabilities to bring about meaningful learning (Fetherston, 2001) and to eventually improve their productivity.

# Teaching students how to use technology

While recognising the value, and indeed necessity, of teaching students how to use technologies specific to each discipline, as well as to general research work (such as statistical processing software), the focus of this section is on the use of general Information and Communication Technologies (ICT).

## Using technologies to access and filter data

The internet offers access to vast amounts of information (and misinformation). We can teach our students to:

* use search engines more effectively. Most search engines have tutorials for how to refine your searches, such as in this [Google Guide](http://www.googleguide.com/advanced_operators.html).
* be aware of the influence of search optimisation techniques on websites. Students may not be aware that many websites use these techniques to optimise the site’s chances of being found by search engines. This does not necessarily mean they’re the most useful or relevant sites.

A quick classroom activity to emphasise the value of good searching technique is to get students to compare the results of their searches (possibly using different search engines) on a specific topic, to discuss who found the ‘best’ sites and to share strategies for quickly finding the most relevant information.

## Using technologies to extract and integrate information for learning

Cognitive skills such as critical thinking underpin effective technology use. Mason, Ariasi and Boldrin (2011) classified the cognitive skills that students actually use in learning from the web as:

* evaluating the credibility of websites. Students tend to evaluate credibility based on source, with high credibility afforded to research institutes and established authorities such as government bodies.
* examining justifications for specific claims. Students looked for research evidence and compared claims with prior knowledge.
* pulling all the facts together. Students looked for strong agreement from multiple credible sources before accepting claims as facts.

The following questions can be used to guide students in evaluating the usefulness of a site:

* Who is the author?
  + How do I know the author is knowledgeable about the topic?
  + What might the author’s motivation/bias be?
* How reliable is the information?
  + Is the information based on evidence?
  + Is the information corroborated by several reliable sources?
* How well does the site explain the information?
  + Is the explanation detailed and clear enough for my purpose?

A useful classroom activity on which to base learning about integrating information found on websites is to direct students to four websites about a topic and give them 10 minutes to respond to a question that requires integration of the information from those sites.

Try to use websites that emphasise the search points above, such as one that

* would come up at the top of a search list because of optimisation techniques;
* looks glossy but does not show who the author is;
* gives different information (not corroborated by the other three sites); and
* is written is technical language with a level of detail far beyond what would be required to answer the question.

Vary the above activity to suit your purpose by changing the question, changing the audience, and/or adding new websites.

## Using technologies to interact, collaborate and create online

Most of our students use technologies to interact with friends all the time, yet they may not be aware of the potential threats to their privacy and the longer-term implications of creating an online presence that could later be viewed by potential employers. Get students to search for answers to the question: How far will employers go to pry into your social network?

Use discussion boards for both online and face-to-face units. Find out more about the benefits of using discussion boards [here](http://www.wpi.edu/Academics/ATC/Collaboratory/Idea/boards.html), including

* greater cognitive and exploratory learning;
* increased student-to-student conversation and collaboration;
* more developed critical thinking skills; and
* greater student empowerment.

Practice good discussion board moderation techniques yourself, and give students opportunities to do the same, using guidelines such as:

* ask open-ended questions;
* play devil’s advocate by using contradictions and counter-examples;
* acknowledge and build on contributions of others;
* redirect questions to others; and
* keep postings short and concise, ending with a question or point for further debate.

Include discussion board participation in your assessment scheme, using criteria such as:

* integration – of readings, of multiple points of view, of other participants’ postings;
* timeliness;
* relevance;
* tone, and appropriate use of discipline specific language and terminology; and
* accuracy, level of detail, and depth.

Be clear and explicit about your expectations, for example:

* you are expected to post four substantive original contributions and six substantive responses this semester. You may not post substantive contributions/responses more than once a week, but may contribute to the discussion by offering brief comments or asking follow-up questions.

Offer guidelines for postings such as:

* use professional and courteous language for all postings;
* clearly state the topic of your posting and outline your main point in the first paragraph; and
* proofread before posting.

# Teaching students how to evaluate technologies

In addition to using technology effectively, we need to know how to select the right tool for the job. That requires an understanding of the affordances of technologies for a particular task in a specific context. It includes:

* evaluating benefits and risks of using technologies; and
* awareness of emerging technologies in relation to current and future needs.

Neil Postman posited that technology gives and takes away (Postman, 1993).

In teaching students how to evaluate technologies we can guide them to consider what a technology affords them:

* what the technology offers, and
* what it restricts or removes.

For example, email offers asynchronous communication that can be casual or formal, but it does not allow access to other communication cues available in face-to-face meetings such as tone of voice, facial expressions, and body language. Emoticons are an attempt to address this deficiency.

Csikszentmihalyi (1993) classified technologies that assisted our thinking as extra-somatic devices. Similarly, Marshall McLuhan (1988) defined technologies as devices that extend natural human abilities. He developed a model on which to base evaluations that helps us to fully describe the properties of each technology (known as McLuhan’s four laws of media):

1. **Extension:** What does the technology extend or enhance? What does it intensify, or make possible, or accelerate?
2. **Reversal:** What might the technology reverse if over-extended? For example, motor vehicles allow faster travel, but too many motor vehicles cause traffic jams which have the opposite effect.
3. **Retrieval:** What can the technology retrieve? For example, storytelling was largely an oral-visual tradition before the advent of printers. You-tube offers retrieval of that tradition.
4. **Obsolescence:** What is pushed aside by the new technology? Note that a new technology may not make the old one totally obsolete (did printing make writing obsolete?).

The above offers a guiding framework for students engaged in the task of evaluating either current or emerging technologies.

# References

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