E-learning opportunities in the classroom

E-learning refers to education that is delivered over the internet or intranet. As a delivery mechanism, the World Wide Web offers exciting new opportunities to educators and learners and should be viewed as more than simply a new way of delivering traditional teaching materials.

Indeed, the Web-based Education Commission in the US reported in 2000[1] that the promise of the internet in education is:

- To centre learning around the student instead of the classroom
- To focus on the strengths and needs of individual learners
- To make lifelong learning a practical reality.

These are exciting outcomes, and to achieve them it is important that issues such as skill development for educators themselves, research of pedagogical models for web-based learning, development of high quality content that is aligned with these pedagogical models, equity of access and bandwidth are explored and actioned.

Educators also need to remember that just as being able to use a typewriter does not mean one is equipped with the skills to write a bestselling novel, the internet does not in and of itself lead to superior learning materials. Dazzling, 'bleeding edge' technology is not the answer to achieving excellence in online learning. Rather, we need to remain focused on instructional design, and achieving educational outcomes by using the web in the ways that set it apart from other educational tools. As soon as we find ourselves using the web to deliver pages of static text, or pages of multiple-choice questions, we should know that we are not using the web well.

E-learning is not a silver bullet that will solve all our educational problems. Rather, it is another exciting tool for teachers to add to their traditional teaching resources. This paper discusses some of the terms commonly used in e-learning, the balance between technology and pedagogy, and explores specific issues to be aware of when evaluating online resources for use in teaching.

Tools of e-learning

Teachers do not need to be technical experts to be able to use electronic resources effectively. However, to ensure they are used to their full potential, a broad understanding of some of the available tools is very useful. Terms and concepts commonly used in the e-learning literature include:

Multimedia and interactivity

Multimedia and interactivity are related concepts. However, they are far from being synonymous. Multimedia includes the use of animations, video and audio. These tools can often be used to explain concepts far more simply than can be achieved using words or static images alone, or to make abstract concepts more tangible. Interactivity relates to the ways that students can interact with the materials being presented. Learning materials can be designed so that content pathways will change depending upon how students interact with the content. The diagram below illustrates the relationship between multimedia and interactivity.

[1] Web-Based Education Commission report: http://www.ed.gov/offices/AC/WBEC/FinalReport/

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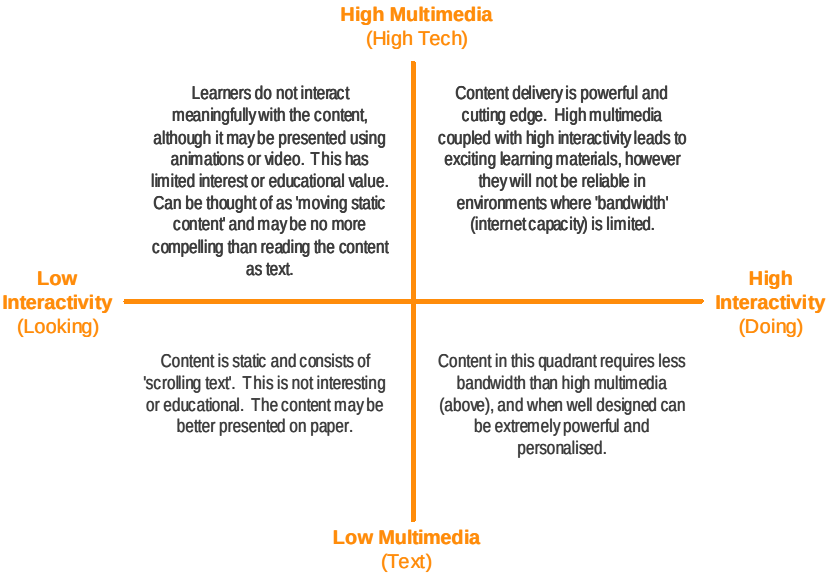

Collaboration and communication

Tools such as email, discussion boards and chat enable users to easily contact each other to share ideas and experiences. This can also give students entrée to communities of practice they may not otherwise be able to access and provides quieter students, who may not otherwise easily participate, a new forum for expressing their 'voice'.

Student centric

E-learning is not designed to remove the teacher from the classroom, however it can change the role played by teachers. Through the richness of content and contacts accessible on the internet, e-learning can provide teachers with a tool to assist them in moving away from a focus on didactic delivery, to supporting students as they explore new content, process it and seek to understand it themselves. Whilst the web encourages a student centred focus, it should be remembered that this can be achieved without relying on the internet as an enabler.

Design and pedagogy

Key issues to consider in relation to web-based instructional design include:

The web is not linear

When we read a book, we expect to start at the beginning and progress through to the end. However, on the web we often do not want to be constrained by being forced to access information in a specific sequence. Therefore, it is important that students can find entry and exit points to and from their required content.

E-learning is not transparent

When we read a book, we can flick through its pages to get a good idea of its scope and quality. However, electronic resources on the web are very different. As their content is largely hidden from view, the depth and richness of their content can be difficult to gauge. Therefore, web resources need to be designed to guide learners and show them how to use the resources. Information should be broken into small, intuitive chunks and structured with a design consistency. This does not mean that the educational design should become mundane and repetitive. Rather, the design needs to stimulate learners whilst simultaneously

providing them with the comfort that they know how to navigate and use the resource.

Appropriate use of e-learning tools

E-learning tools such as multimedia and interactivity should be used. However, they must also be appropriate and meaningful. Tools that add limited value or are not well integrated with the rest of the design quickly frustrate users.

These experiences reinforce for us that in balancing the use of technology with pedagogy, the key focus must be on the instructional design. Technology is not a limiting factor as much as in our ability to conceive how it can be used.

Opportunities in the Classroom

Question and answer activities

In mathematics teaching, one of the most common uses of e-learning is in the delivery of question and answer type activities. These can be used for individual or team based activities, to present new content or to revise existing material. To retain student interest, a range of different question types should be used and if content is delivered and answered 'online', students should be able to submit their answers and receive immediate feedback.

From the designer's point of view, the simplest way to give students feedback is to tell them if their answer is correct or not. From the student's point of view, this is not very satisfactory. A far more powerful use of the web is to give students feedback that is tailored to the specific answer they have provided. For example, rather than giving every student exactly the same feedback, responses can be tailored to specific anticipated errors that a student may have made.

Acknowledging that different students learn different information at different rates, online resources can be programmed to guide them through activities based on their personal rate of learning. Stronger students experience accelerated pathways, and students who need more practice of specific concepts receive the opportunity to master each concept before moving on. This is similar to computer 'adaptive testing' where the questions that students are given adapt to the answers they have provided.

Response tracking systems can be used to give teachers access to student responses. Whilst students may receive immediate feedback through the computer, teachers can access their responses to monitor student performance and identify trends in areas students have either mastered or need more development in. From the student's point of view, receiving continuous performance feedback and hints for how to improve is very motivating.

'Authentic' problem solving

The quantity and quality of information on the internet means that 'problems' students are set to solve can be very realistic, or 'authentic'. Simulations and scenarios that closely replicate real occurrences can also be developed. In developing simulations, the quality of the instructional design is again very important in ensuring that the scenarios unfold accurately and authentically.

Using what is literally the world's biggest library, students can pursue their own line of enquiry or interest to assist their problem solving in a self-directed manner. For example, teachers could build scenarios that require students to use primary source information such as the stock exchange or company reports that are readily available on the web.

Evaluating e-learning

The old adage 'you get what you pay for' arguably does not apply strongly to e-learning. Whilst there are many excellent resources available for free, there are also many expensive but mediocre ones. In evaluating the plethora of resources available, ideas to consider include:

Put quality content first

Seek evidence that the content has been designed specifically for delivery over the web and that interaction is meaningful, without relying on gimmicks or glossy, high bandwidth presentation.

Understand why you need it

E-learning resources developed for use in a supported environment like a classroom may be different from resources that students are required to use on their own. Research tools that operate like portal sites with lots of links to other information can be very successful in the classroom where they can be used for supervised group work. However, without strong direction students may become distracted by irrelevant although interesting content that moves them too many 'clicks' away from where they need to be. A homework resource is likely to be smaller in scope and with a strong navigational structure that supports lower supervision.

Communication tools

The web offers the opportunity to tap into a wide community of teachers, experts and mentors through communication tools such as email, discussion boards and web chat. However, these tools can also be distracting and it is useful that, if an e-learning resource offers these features, they can be turned off when not required.

Bandwidth

Bandwidth refers to the speed of an internet connection. Leading edge technology generally requires high-powered multimedia capable PCs that are capable of running the latest operating systems and browsers. More importantly, these can be highly bandwidth hungry and, without fast internet connections, they are very frustrating to use. Resources that can be 'cached' (stored) on a local computer network are helpful in increasing speed of response.

Licensing limitations

E-learning is often priced on a per-user basis. Licensing issues to consider include whether the resources can be accessed from school and home, who can use them, how many teachers and/or students can use them at the same time, can they be tailored, and are there restrictions on the number of accesses. E-Learning resources are often available for trial before the final purchase decision is made, and this is a great way to confirm that they seriously do what you need them to do.

Conclusion

The introduction to this paper quoted the Web-based Education Commission in discussing the 'promise of the internet in education' to centre learning around the student rather than the classroom, to focus on the strengths and needs of individuals, and making lifelong learning a practical reality. Whilst these are not new concepts, and e-learning is not essential to achieving them, it is a tool that can assist students to drive their own learning and develop skills that are key to success in a knowledge driven environment.