e-Learning: the nature of the research evidence

A point to bear in mind:

If we had been asked to find some research that proves that *books improve student outcomes* we might well have been unable to do so. But had we been asked to find robust evidence that *books – when used appropriately – are likely to improve a certain set of student learning outcomes* then I am sure we would succeed.

So it is with e-Learning; and here are some examples of evidence that links the use of specific digital teaching practices with specific student outcomes:

> ➢ "In 2002, […] Maine became the first state in the country to give every seventh- and eighth-grade student and educator a laptop for use both at school and at home. Research on the effectiveness of the program shows that student learning has improved (Berry & Wintle, 2009; Silvernail & Bluffington, 2009; Silvernail & Gritter, 2007), and the program is now being expanded to high schools."

http://www2.ed.gov/about/offices/list/os/technology/netp.pdf

> ➢ "Tarrant [High School] students [in Alabama] are taking advantage of ACCESS, the state's online learning program, to take courses before or after school or in the summer in order to recover credits for courses they have failed or to graduate earlier. The school's principal believes that ACCESS has been a significant factor in raising her school's graduation rate from 66% in 2006 to 80% in 2008. Research conducted in the state of Washington has concluded similarly that online credit recovery can help increase graduation rates (Baker et al., 2006)."

http://www2.ed.gov/about/offices/list/os/technology/netp.pdf

> ➢ "[In science teaching and learning] computer simulations of experiments and processes incorporated as short episodes in existing curricula have been shown to enable students to perform at higher cognitive levels (Huppert et al, 1998; Cox, 2000) and to promote conceptual change (Tao & Gunstone, 1999; Jimoyiannis & Komis, 2001)." From Webb, M. & Cox, M. (2004). A review of pedagogy related to information and communications technology, *Technology, Pedagogy and Education*, 13, 3, pp. 235-286.

> ➢ From Becta, in Britain, the following findings provide evidence of a more general set of benefits: "The evidence tells us that integrated use of technology enables a range of positive outcomes for children and young people.
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> Impact on attainment at Key Stage 1
> 4.75 months' progress for high attaining girls in Maths. Improved progress for girls, average and high attaining boys in science. Improved progress for average and high attaining pupils in English.
>
> Impact on attainment at Key Stage 2
> An average gain from ICT use was equivalent to: a term's additional progress in English. 2.5 months of progress in writing for low attaining boys. 2.5 – 5 months'

progress for some groups in maths through effective use of whiteboards. 7.5 months' progress for some groups in science through effective use whiteboards.

Impact on attainment in secondary school
The equivalent to a term's additional progress in KS3 science. An average gain in GCSE science equivalent to 52,484 students moving from grade D to C. Improvements to the overall percentage of pupils 5+ A*-Cs at GCSE in the year after broadband introduction. After controlling for KS3 results, the availability of a computer at home is significantly positively associated with Key Stage 4 test scores. This association amounts to around 14 GCSE points (equivalent to 2 GCSE grades).

http://publications.becta.org.uk/display.cfm?resID=41343

➢ In addition to the evidence-based claims for the specific benefits from the use of ICT in pedagogically sound ways, powerful research also exists which describes emerging best practice in the form of case studies. For example:

An Australian study of emerging best practice in a range of e-learning contexts:

http://www.deewr.gov.au/Schooling/DigitalEducationRevolution/Documents/exemplar_schools_report_pdf.pdf

and a Ministry-commissioned report by NZCER and CORE Education entitled *Literacy teaching and learning in e-learning contexts.*

http://www.educationcounts.govt.nz/publications/ict/77144

Also: e-Learning and implications for New Zealand schools: a literature review

http://www.educationcounts.govt.nz/publications/ict/77614

➢ Finally, consider what the learners have to say about their experiences.

1082 participants in an Australian study of the views of a group that ranged from primary students to beginning teachers expressed their belief that including technologies in education and training has the following benefits.

"Technologies enable them to
• access easily, detailed information;
• build skills through problem-solving;
• develop maths, informational and other literacies;
• practice tasks;
• increase their and others' motivation to learn through interest-focused and self-directed work;
• improve the presentation of work including through the use of office productivity and multi-media software applications;
• personalise learning that supports different learning styles and levels; and
• increase their control over their learning."

http://itmadesimple.typepad.com/files/295m1722.pdf