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Theory and method as tools: reflections on research on the pedagogical uses of ICT in education

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Abstract

The present set of papers is reviewed in light of their commonalities and their relative homogeneity. Design forms of research are contrasted with traditional variable-based or theory-based inquiry. The disruptive role of research on ICT in education is considered, in contrast to its role in incrementally contributing to a knowledge base. Researchers and practitioners alike are encouraged to question and examine their own tools, including ICT but also including the theories, models, and methods used in inquiry and instruction. As researchers include practitioners' voices and perspectives, a process of dialogue can heighten awareness of problems and stimulate change.

1. Theory and method as tools

1.1. Reflections on research on the pedagogical uses of ICT in education

My first exposure to some of the research reported in this issue came at the annual conference of the American Educational Research Association held in Chicago April 2003. I heard reports that challenged my assumptions about learning and instruction, for example:

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- An intentionally stripped-down, text-only learning environment leading to more learning than a rich multimedia environment.
- A text-based planning tool helping writers more than a dynamic graphic tool, with neither tool working very well compared to no tool (Erkens, 2003).
- Students performing scientific inquiry in an ad hoc, nonlinear way far removed from the idealized steps suggested in formal models of inquiry.

These anomalous findings were unsettling and challenging. They provoked me to think, to look further about what was really going on, and to consider how pedagogical principles get translated into designs, tools, practices, and ultimately, allocation of resources. Instead of being comforted by settled answers, I was stimulated by disturbing questions at fairly deep levels of engagement.

On reflection, it is clear that research into pedagogy can serve different purposes. A conservative form of research, based solidly on established theory and applying proven research methods, can add new knowledge very incrementally and cumulatively. Another session at AERA was just like that – a small-scale laboratory study used multimedia teaching materials that had been used in dozens of earlier experiments (Mayer & Dow, 2003). The design was carefully set up to test a set of hypotheses about conditions for multimedia learning. The study yielded helpful results in fine-tuning a growing theory of instruction, already based on dozens of studies just like the one reported.

While I do not deny the value of systematic theory building through experimentation, as an instructional designer, I tend to look more holistically at instructional problems. I am more keen to see design experiments growing directly out of practice or out of designs of real curriculum materials (Kelly, 2003). Such holistic studies may not answer every question – and they may not even provide a clear test of a particular principle – but they have the potential to open up new design possibilities and new connections between design elements. They also offer a potentially stronger link between the research study and the practice environment, where presumably, learning materials are being used by students and teachers in realistically scalable ways.

Using the papers published in this volume as samples of Dutch research into pedagogical uses of ICT, I maintain my enthusiasm for the work. I was impressed with the range of problems addressed by the papers, all focusing on pedagogy but spanning across grade levels, subject matter, instructional strategy, even venturing into issues of teacher learning and technology adoption. I realized after reading the present set of papers that my sense of holistic design research I recalled from the AERA meeting may have been partly due to the condensed presentation format at the conference. Even so, the studies in this volume address serious problems of practice. They share a number of commendable features, including:

- A consistent paradigm of thinking about educational problems and theoretical solutions.
- Good mastery of research literature relevant to the problem.
- Careful application of quantitative and text-analysis methods.