

The Need for More Systematic Evaluation of Research into Post-secondary Teaching

Alan Slavin
Department of Physics
Trent University

The recent conference at McMaster University of the Society for Teaching and Learning in Higher Education (STLHE) provided an exciting forum for the innovative work being carried out in post-secondary teaching in Canada. However, in the large majority of presentations I attended, I was struck by the lack of either quantitative or qualitative evaluation of the effectiveness of this innovation. While many of the talks made me want to try something similar in the courses I teach, how am I to choose where to concentrate my efforts if there is no evaluation of success?

I contrast this to the situation in research into undergraduate physics teaching over the last twenty years, particularly at the first-year level, in which there has been much focus on evaluation (McDermott, 2001). For example, there has been a cumulative study over some 6500 students of their understanding of force concepts, comparing the effectiveness of the standard lecture approach with that of an “interactive-engagement” (IE) approach (Hake, 1998). Performance was evaluated using a standardized test given at the beginning and end of the course to normalize for incoming ability. Students taught using IE approaches showed an average improvement twice as large as those from the lecture approach. This leaves little doubt that putting time into an IE approach is well worth the effort!

One should not, of course, expect all presentations at STLHE to give statistics on 6500 students. It would defeat much of the informal, trial-and-error atmosphere that makes STLHE such a useful and pleasurable conference. At the same time, I believe that almost all presentations should involve a significant evaluative component to be of real use to the audience, unless they are workshops on approaches that have already been proven to work. How do we encourage such evaluation? In one session I raised this issue and was informed that the instructional development office at the University of Calgary (Learning Commons Fellowships, 2002) requires that any application for funds for teaching development “must contain a comprehensive evaluation plan” (p. 7). The Terms of Reference are clear that applicants must respond to the question, “What methodology will be used to assess the deliverables or outcomes of the proposed fellowship activity?” (p. 7).

I believe that this is a model that all instructional development offices (IDO) in Canada should follow except for applications for implementation of proven methods. Ideally, such a proposal should involve a baseline study to determine student performance prior to the implementation of the new approach. This obviously could delay implementation for a year or even more but may be necessary if we really want to evaluate effectiveness. An alternative is a pre-test/post-test as in the physics study discussed above; developing such a test is a significant undertaking in itself but could be a great boon for comparing the effectiveness of different approaches. Clear goals for the program must be stated at the beginning, with a methodology for evaluating their success. The requirements must not be so stringent as to discourage faculty from being innovative, but subsequent funding should be contingent on the submission of a report that describes progress towards achieving these goals. Class size is often too small to give meaningful statistics in a single year, so the IDO should also encourage follow-up studies that would improve the statistics. Another legitimate goal of innovative teaching is retention into upper years, and this can often be evaluated effectively only with a multi-year study that accounts for other trends.

An effective evaluation clearly will require more work on the part of the instructor/researcher. However, there is no alternative if we are to know what works and what is merely feel-good.

References

Hake, R. R. (1998). Interactive-engagement vs traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, 66, 64-74.

Learning Commons Fellowships: Terms of Reference (July, 2002). University of Calgary.

McDermott, L. C. (2001). Oersted Medal Lecture 2001: Physics Education Research---The Key to Student Learning. *American Journal of Physics*, 69, 1127-1137.