Why do some academics resist using active learning techniques, given that the education outcomes are so compelling?

A. Mazzolini, and S. Daniel

Engineering and Science Education Research Group, Swinburne University of Technology, PO Box 218, Hawthorn, Melbourne, Victoria, 3122, Australia

amazzolini@swin.edu.au

At Swinburne University of Technology, we incorporate interactive lecture demonstrations (ILDs), which are a form of active learning (AL), into our introductory electronics course. The ILDs are used in a blended learning approach, where revision ILDs help to consolidate important concepts after the completion of traditional (passive) lectures (for example, see [1]). The analysis of our education research data, which is discussed in this paper, indicates that:
(a) traditional lectures do little to improve students’ conceptual understanding.
(b) ILDs improve students’ conceptual understanding significantly.
(c) the ILD learning cycle, where students actively engaging in discussions about the ILD activities, improves conceptual understanding significantly.
(d) students’ exam performance is significantly better in sections that have been taught by traditional lectures plus ILDs, compared to sections that have been taught by traditional lectures alone.

Our education research evidence from Swinburne, and several decades of similar validated results from physics education research throughout the world, appears to have had only limited impact on improving the teaching practices of many science and engineering academics. The reasons for this reluctance to upgrade teaching practices, even when confronted with compelling evidence, may be associated with the academics’ deeply-rooted conceptions about their traditional transmissive teaching methods [2]. These academic conceptions, and the ways that they can be adapted to improve student learning, are discussed in some detail in this paper.