

Editorial

The widespread use of communication technologies has triggered a frenzied activity in research into the educational implications of the new technologies. This is particularly so in tertiary engineering education. For a good reason; engineers receive education involving complex theoretical and laboratory activities. Ever since Gutenberg invented the printing press in 1453 educators have been employing a frontal approach of the teacher standing in front of a class of sitting, mostly obedient students. Tertiary engineering education, which is a relatively recent educational discipline beginning in the 19th century, has added laboratory and exercise work to its educational framework over and above the prevalent teaching practice in those days. Since the advent of IT, educators have been concerned by the impact it is making on the ways we teach and the ways students respond. Engineering education is now on the way to emulate industrial practice in its educational modes. An example for such an approach is virtual remote teams for engineering design education—planning and executing the design and production of artifacts by non-colocated teams. This type of teamwork represents comprehensive projects which begin with basic studies such as materials science, CAD and Product Data Management (PDM), and importantly—organisation and management of team activities, and culminates in the production of a prototype. A further example is the utilisation of buildings as live labs for measurements of heat, water, pressure, and construction parameters, either as passive data analysis resources or as active resources to control the building's parameters (see papers by Cowan and Hutzler in this issue). Such elaborate educational developments imply new thinking on the financing of engineering education. Some of the IT developments can involve savings in equipment and even teaching personnel, such as the rapid increase in deployment of virtual instruments in engineering education, which spares laboratory equipment and is promoting scalable student centered learning. But the cost of purchasing, maintaining and student mentoring can offset the savings by far. IT implies that teaching staff and teaching assistants are in much closer contact with their students, so that teachers are encouraged to shift from the frontal approach—little student contact—to a comprehensive approach of a synchronous and asynchronous involvement of students and academic staff. A pioneering new plan to integrate the new engineering environment into the curriculum is presented in the papers by Cowan and Knapper in this issue. Symbolic of the increased involvement of universities in developing engineering education is the establishment of a Chair in Engineering Education at Queen's University. We could not have envisaged that this would be possible 30 years ago.

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