

Education: When Investment in Technology is not Enough

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Another day, another airport and following a delayed arrival, I queue for more than an hour to hire a car. Unthinkingly I stare at a large behind the counter display as it scrolls through seemingly endless ads for car rental options. Suddenly I'm aroused from catatonic lethargy by the slogan: *'Who needs I Spy – When you have WiFi?* This is accompanied by enticing images of in-car tranquillity with youngsters in the rear seat engrossed in working their mobile media. Surely even the most tedious of traffic jams would pass unnoticed?

It certainly is fascinating to watch pre-schoolers using Tablets – especially given their rapid and confident pace of interaction. To raise questions about the level of parental investment in these technologies, their over-use, and any potentially negative consequences is to risk being viewed as a killjoy. After all there is a danger of following in the footsteps of a previous generation with their frequent dire and ill-founded warnings about the perils of sitting too close to the TV and of addiction - as demonstrated by viewing 'the box' for more than 30 minutes each day.

Concerns that digital technologies threaten to disrupt early childhood development of social and problem solving skills (primarily learnt by unstructured forms of play and through social interaction), are not as yet properly supported by research. Certainly, as with TV, in the absence of appropriate parental input there is always the possibility that mobile devices may become overly used 'digital pacifiers'. Conversely, with informed guidance a child's learning experience is enriched by the judicious use of technologies that complement – rather than supersede – traditional forms of learning. Childhood delight in that irritating game of 'I Spy' will perhaps never die.

In the case of older children, the annual global ICT investment in schools is estimated to be ~£17.5 billion (Gartner). Despite this scale of expenditure, an OECD report (September 2015) casts doubt on the educational returns that this generates. Their findings suggest that the highest achieving school systems (in countries such as South Korea and Japan) have the lowest levels of in-school computer usage, and that pupils who very frequently use computers attain the lowest results overall.

Certainly, in recent years governments have viewed digital technologies as the silver bullet needed to eliminate mediocrity in teaching. Unfortunately, there has been a failure to properly recognise that the effectiveness of these technologies is not determined by hardware and software *per se*, but is entirely reliant on the digital skills of individual teachers. Consequently, the OECD findings may in fact reflect a failure to properly invest in the development of crucial teaching skills, and hence the manner in which technologies are used in education.

Unfortunately, traditional and computer infused learning modalities are often perceived as being in competition with each other – with many seeing the former as being threatened by the latter. This competitive approach parallels events that took place in higher education some years ago when there was a widespread move to replace traditional forms of laboratory based practical work with computer-based simulation techniques. Undoubtedly

simulation offers greater flexibility, enables work to be carried out more quickly, eliminates health and safety issues, and reduces teaching costs by removing the need to maintain physical laboratories (and costly infrastructure). As a result employers soon discovered that they were recruiting physics and engineering graduates with minimal practical skills and experience. Consequently, a more balanced position has now evolved where traditional forms of laboratory work and simulation-based learning stand side-by-side with their complementary strengths being recognised. Furthermore, it is now widely appreciated that although simulation can alleviate many of the difficulties associated with practical experimentation, it is no panacea as students will often place implicit confidence in the validity of computer generated output. Therefore, there is still a need to ensure that the use of simulation systems is supported by experienced educators who have the digital skills needed to understand their operation and application.

When considering the role of digital technologies in education, it is important to distinguish between technology *infused* learning and technology *enhanced* learning. Irrespective of student age, infusion by no means guarantees enhancement of learning. This is particularly evident in the case of fully online HE education which places significant demands on teachers and students alike. However, when technologies are used effectively, the results can be superior to those obtained through traditional modes of delivery.

In order to truly *enhance* the online educational experience, technologies must not simply bridge the physical distance existing between the learners and teachers, but must also mediate in a number of crucial ways. This relies on participants being receptive to the need for adaptation – for optimal results it is insufficient to simply apply traditional teaching and learning techniques. From the student’s perspective, it is necessary to recognise that the scope, profundity and efficiency of the learning process can be enhanced by group interaction. In this respect, when dealing with students who are transitioning to the online modality, particular onus is placed on the educator to nurture the formation of a dynamic virtual classroom to which students are encouraged (rather than being required) to actively contribute. Invariably students quickly become confident in their use of online technologies but are often initially less confident in their ability to make meaningful contributions to discussion. However, once human factors are addressed, a vibrant learning community quickly develops and students no longer feel the need to overcome subject difficulties in isolation. It is a delight to teach in such an environment.

The online experience can be further enhanced by ensuring that flexibility in learning truly takes account of the numerous daily commitments around which today’s HE students are forced to fit their studies. This can be accomplished through the integration of mobile media and in turn this provides an important opportunity to ensure that student communications receive rapid attention.

Certainly the online learning paradigm provides great scope to develop and apply innovative technology infused learning techniques - although as with any other form of teaching, benefits are wholly dependent on the partnership that develops between administrators, educators and students. This partnership is not fundamentally underpinned by technology but rather by the richness of human communication – for after all, when we look back and consider why we became particularly interested in any subject, we often find that our interest was catalysed by the passion of a great and memorable teacher. These are the teachers who are able to use technologies (should they be moved to do so) to their full potential - but it is highly unlikely that technologies will ever compensate for mediocrity in teaching. This is a point made in the OECD report (mentioned previously): ‘*In the end technology can amplify great teaching, but great technology cannot replace poor teaching.*’ In fact,

technology can make poor teaching even worse, foster mediocrity and result in a tick-box approach to gauging educational success.

Contrariwise when placed in the hands of parents and educators who are knowledgeable and confident in respect of digital systems, traditional and digital techniques fuse together in a symbiotic partnership that truly enhances the learning experience.