

ITALICS Editorial – The State of ICT Skills Education

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1. Introduction

Welcome to this special edition of *ITALICS*, the journal of the HEA-ICS. I am honoured to have been asked to be guest editor of this issue.

In 2002, Reffell and I proposed that certain pedagogical problems affected the teaching of information and communication technologies (ICT) in the UK education sector (Reffell and Whitworth, 2002). We suggested that ICT could and should be treated as an intellectual as well as just a service subject and suggested some elements of a curriculum in ICT skills which was more oriented towards the “I” and the “C” than the limiting “T”. It is the overall aim of this edition of *ITALICS* to expand on that assessment. Have there been developments in the past two years, and if so, what? What are the organisational and technological factors which influence the development of curricula? These questions are addressed in both this opening editorial and the three accompanying papers, all written by academics involved with the integration of ICT into HE.

2. Problems with the embedding of ICT into HE

ICT’s vaunted status as a key skill is belied by its marginal status in many universities. Two main causes are suggested:

- that ICT skills teaching is considered a *service subject*
- that ICT is a field in which there is *rapid change*.

This section elaborates on those points.

2.1 ICT as a service subject

ICT is sometimes studied as an intellectual subject, particularly (although not exclusively) in departments such as Computing, Library and Information Studies/Science, Communications Studies or Education. Whole degrees are sometimes offered in it, at various levels (see Peters, this collection: McPherson and Nunes 2004). But ICT is actively used, both on- and off-campus, by far more people than those who study it in depth on programmes like these. Despite concerns that we risk moving to a passive relationship with this technology, the relationship of the average person to ICT is far deeper than it is with, say, medical technologies. Almost no one in a 21st century university—academics, administrators or students—can avoid very frequent engagement with ICT and the same is true of members of almost any modern organisation. Therefore, there is a clear *generalisable* need to learn ICT skills as an adjunct to many other degrees. Hence the term, “service subject”. What ICT suffers from is not this definition *per se*, but the low status attached to “service” teaching.

The QAA have published “benchmarks” for many academic subjects, including Computing (<http://www.qaa.ac.uk/crntwork/benchmark/computing.pdf>). But neither these benchmarks nor similar documents for related subjects like Communications

Studies really address what ICT skills are or how they should be taught. It may be that because the need for ICT skills is seen as generalisable, no-one seems willing to take on responsibility for defining its role (perhaps for fear of transgressing on other disciplines).

Yet although the need for ICT skills can be generalised, as with any other field of teaching there is a “granularity” of expertise rather than a uniform distribution. In the first place, students now arrive at university with a wide range of ICT skills ranging from the non-existent to the expert. More significantly, local expertise amongst academics and support staff is likely to vary. Localised centres of excellence are not, of course, a bad thing, but if a university lacks local expertise in (say) Biochemistry, this is unlikely to impact at all on most of the day-to-day work and study which takes place there. This cannot be said to be true of ICT expertise. While it is true that every university will now have ICT support staff, the numbers of academics who are actually conducting research into their ICT teaching is low. This is connected to the historic problem in motivating discipline-based academics to do research into teaching, exacerbated by ICT’s status as a service subject.

The work of the HEA-ICS is very welcome here, but there is a long way to go. Lack of status means a lack of control mechanisms which exist to maintain that status. ICT skills education is only beginning to develop networks of teachers and users to take responsibility for maintaining the intellectual quality of the field through such means as peer-review, funding decisions and so on. It is not surprising that there is little literature on the teaching of ICT generally and what exists is almost entirely focused on the end-user rather than teachers, and takes a standardized, package-based approach. This much is obvious from a look at the “Computing” section of any bookshop.

The discrepancy between the need for expertise in teaching and the actual spread of that expertise is therefore felt more acutely in ICT skills education than any other subject. It can be hard to find the right level of ICT skills training, and if that level is too high *or* too low, students may reject both the teaching and the technology (Selwyn 1998). This is a real problem, considering the pressure placed on universities to use this technology in teaching. When it is used, it is often not integrated into the teaching—meaning that it does not exploit the specific opportunities for interaction and information production which ICT alone can offer. More usually, the use of ICT does not extend far beyond a compulsion to use Word to write a final essay, a vague assumption that students will find sources on the WWW and perhaps an online course admin system. And even when greater integration occurs there is no guarantee that students will have the skills required to make effective use of e-learning or other ICT applications in their studies, or that their institution offers them adequate opportunity to learn the necessary skills (Rae, this collection). All in all, what often happens is that students are not taught ICT to enhance their degrees, but instead are taught “the kind of office applications that are wanted by employers” (Gordon, this collection). This is epitomised by the standardised, commercialised ECDL which is so often treated as the “benchmark” of proficiency in this field, in lieu of more academically-oriented standards which one might expect the QAA to have defined.

2.2 Rapid change

Even if the bureaucratic processes of universities were accelerated (cf. Peters, this collection) there would still be a three-year time lag between teaching skills to first year undergraduates and their being able to apply these skills in a workplace. This is true of any course, even non-technical ones, although with knowledge and skills which apply in relatively stable environments it is not really a problem.

However, with ICT the pace and scope of change is astonishing. Computers in the modern sense have been with us for sixty years now but the WWW was not even invented until the 1980s and only entered public consciousness in about 1996. E-mail, the mobile phone, Napster and other icons of 21st century ICT were not mass-market even ten years ago and some did not even exist. A 1992 textbook entitled *Teaching mass communication* (Murray and Ferri 1992) makes no mention of any sort of computer-mediated communication. It is therefore unsurprising that, as section 2.1 noted, no intellectual rationale for teaching these new skills has yet emerged.

2.1 also described the lack of training in, resources for, and interest in developing ICT skills programmes which are intellectually-based for general student audiences. Universities must also compete here with a huge amount of external resources. ICT is a field where it is acutely true that “the university is increasingly losing its position as the privileged locus of authoritative knowledge” (Robins and Webster 2002, p. 11). In the first place there is a high level of informal education in ICT (Rae, this collection: Whitworth, 2004, p. 139). More significantly, employers often demand their employees acquire qualifications that are not university-based, such as the ECDL or, at a higher level, the Microsoft and Cisco technical certificates. Even if universities respond to this by embedding those certificates in their degrees “to improve student employability” (Peters, this collection) this hardly addresses concerns that ICT skills education is not working to enhance students’ intellectual development, nor that it is under the control of individual academics, departments, or even agencies such as the HEA or QAA.

Yet at the same time, the ubiquity of ICT and its importance for employability and profit margins means that universities are under intense pressure to incorporate it as fully as possible. Students both expect and demand its presence in their degrees (Gordon, this collection). Funding bodies and employers make similar and more influential demands (Peters, this collection). The quality and accessibility of university ICT networks and teaching is now a factor in determining admissions. It may not now be enough to place internet access in all halls of residence (something even my own large and relatively well-off university has not yet managed); an increasing number of students are now wondering why there is not yet a wireless network across campus. The rapidity of change, the constant cost of new technologies, and the time-lag problem with applying learnt skills are all even more true with software. However, the sheer size of most universities makes the overhaul of a network and its software an expensive and laborious task. ICT becomes not an investment but a constant and rapidly depreciating cost (Luke, 2002, p. 271).

Academics who are not specialists in ICT have little motivation, time or resources to devote to constantly updating courses when they will see little reward for doing so in terms of their career development, RAE rating and so on (Gordon, this collection). Indeed, as their own training is also often technologically-oriented, a vicious circle may

develop. In this environment it is unsurprising that ICT teaching remains biased towards commercial packages, holds a low status in academia, and lags well behind the needs of industry and the students themselves.

3. Ways forward

I now suggest ways in which we can move forward out of the trap in which ICT skills education finds itself. I do not claim this list is definitive—there may be alternatives—but I have chosen these three because they are all based on existing work taking place in the UK and I suggest this demonstrates they are at least feasible.

3.1 Information literacy

Reffell and I called our 2002 paper *Information fluency in the digital lifeworld*. We observed that to become truly *fluent* in any mode of communication it was not enough just to learn the “motor skills” (such as, for a human language, vocabulary and grammar). As well as these one needed to immerse oneself in a different *culture*, gaining practical experience of not only the mode of communication but also the wider environmental context which both shapes and is shaped by it. We suggested that this was as true of computer-mediated communication as of any other form. Only through such teaching would students be able to actively contribute to, rather than just observe, online public spheres and be able to cope with the constant upgrading of low-level skills through a higher-level appreciation of the wider context of not just “ICT” but its component parts (information—communication—and technology). We called this “information fluency”, following Herbert Lin (2000).

One can also distinguish between technical competencies and a wider ability to deal with information in the sort of critical fashion which could see students through lifelong learning. This wider approach has been termed *information literacy* (Andretta 2004). Such teaching is a necessary response to the fact that increasing numbers of students are arriving at university with technical skills, but not the ability to *critically* assess either ICT generally or their own competence with the technology and information to which ICT provides one means of access.

An information literacy course would start with the assumption that, as part of any programme of study in HE, students need to develop a critical stance towards the information domains available to them. Once such a stance had been established, students could establish for themselves whether a technological tool is appropriate for a given task. Their relationship with both ICT and information itself could be personalised, instead of their having a set of standardised, technology-based teaching materials imposed on them from some external source. (See also <http://www.ilit.org>.)

I also suggest that it is becoming culturally important to understand certain basic ICT principles. For example, there is widespread ignorance of things such as basic network security which contributes to the diffusion of viruses, worms, and so on. At a higher level, there are important political debates occurring—or rather, not occurring—around the role of ICT in society to which many people cannot contribute. A parallel could be drawn with another ubiquitous technology, the car, which people appreciate more as a cultural artefact than a technological one. Debates about congestion, road tax policy, road building and other aspects of government policy are followed and felt to be of personal relevance even by those who can barely change a tyre or who may not even

possess a license. But issues such as the monitoring of web browsing, the security and morality of the government's proposed new ID card and the future of the GPL and free software (Winstanley 2004) are unappreciated by many despite their relevance to us all. Universities should have an active role to play in fostering public debate (Delanty 2002, p. 39) and these subjects should appear in any broad programme of genuine information literacy.

Teaching students to critically appreciate ICT may ultimately involve encouraging them to ask searching questions about its role in their degrees and in society as a whole. Yet this sort of education has never been popular with vested interests whose position at least partly depends on people *not* asking such questions (cf. Welton 1995, p. 3). However, even if one does not accept the moral arguments in favour of critical pedagogies, the lack of genuine information literacy is something which may well come to have a negative economic impact on students, universities, and possibly the whole UK economy. There has not yet been a large-scale, comparative assessment of the impact of information literacy programmes, but the idea is nevertheless gaining salience, and would only be enhanced by such a study (cf. 3.3 below).

3.2 Sharing of resources

Expertise may be unevenly distributed, but this can be compensated for by innovations such as:

- publicly-accessible course materials (for example, <http://www.leeds.ac.uk/acom/webdesign/materials>)
- the development of question banks and similar resources (Stephens and Hackett 2004)
- the development of open source applications and other personalisable technologies; an important counter-strategy to the increasing control placed on academic autonomy by both university management and commercial software suppliers (see Luke 2002: Cornford and Pollock 2003, ch. 7).

The work of the HEA-ICS is also important here but in the end this depends on individual academics taking it on themselves to share developments. Gordon (this collection) alludes to difficulties with getting staff to overcome the "not invented here" syndrome and embrace resources and techniques developed elsewhere, but the next section addresses that point.

3.3 Research and training

A great deal of research is being done into the development of educational technologies, mainly because there is a great deal of money to be made here (Luke 2002, pp. 267-72). There is nothing wrong with this work: without continuous innovation, HE will find it even harder than it currently does to keep up with developments in the ICT industry.

But research only into new technologies, driven by commercial motivations, is not going to resolve the difficulties of ICT skills education. Alongside this work we also need the following:

- Too much research looks only at one tool, course or innovation. Where is the methodologically-sound *comparative study* which will enable us to properly evaluate

these innovations? Of the thirty full papers included in the proceedings of the 2004 HEA-ICS annual conference only *one* (Mathiasdóttir 2004) reported on developments across more than one university and even this paper did not set out to evaluate the use of a teaching technology.

- As well as developing new technologies we need research which matures our understanding and use of those technologies which already exist (Luckin *et al* 2004).
- Educational technologies cannot be studied in isolation but must be considered as being an integral part of wider organisational, political, commercial, psychological and technological contexts (McPherson and Nunes 2004).
- Research needs to be driven by users—i.e., individual academics and students. Rather than having to adapt their teaching to the demands of off-the-shelf packages and pre-written “learning objects” they can and should be encouraged, as part of continuous professional development, to explore the use and adaptation of the technologies to their own needs. Action research may be of assistance here (Zuber-Skerritt 1992; McPherson and Nunes 2004).

In short, research needs to look at *effective use of existing technologies* as well as contributing to the development of new technologies. This work must be supported by the research councils if the use of ICT in UK universities is ever to be doing more than play catch-up with commercial developers.

4. The papers

Three case studies from the current state of ICT skills education are also presented in this issue. Each of the authors has surveyed students and/or courses at their home institution.

Neil Gordon’s paper, “Experiences of embedding Information Technology into discipline based teaching”, presents a typical case. He reports on attempts to embed ICT into the teaching of a Mathematics department at Hull University. The evidence he presents is anecdotal, but while this means his conclusions cannot be generalised across all universities, the story is doubtless a familiar one to many UK academics. Problems arose at Hull through such things as: conflicts between the perceived integrity of the subject and the various pressures to embed ICT into teaching; limitations of existing packages, and difficulties with tailoring them to diverse student needs; no simple way of assessing the range of students’ existing ICT skills and adjusting the material accordingly. There is also the interesting point that many students and staff can see ICT as a unified entity rather than a broad range of skills, and problems can arise if one tool or interface appears incompatible with another being used on a parallel course.

In “Where, When and How do University Students acquire their ICT Skills?”, Simon Rae presents a considerable amount of quantitative data which can help answer that question. Rae’s institution, the Open University, has a particular interest in that question due to its heavy use of distance learning and also the larger number of mature and working students it recruits. But both these are areas in which many universities plan to expand, with the assistance of e-learning. What is interesting in Rae’s data is the high level of informal education in ICT, often in skill sets that do not necessarily correspond with those which will be emphasised in e-learning or even in face-to-face courses (such

as the general unfamiliarity with chat rooms and bulletin boards). We must also note that students' *perception* of their skills is not necessarily the same as what they will actually be able to do in a university environment, where a more critical approach to information is usually expected.

Mike Peters' paper examines the possible impact of Foundation Degrees in ICT, offered as a route in to HE or, possibly, as a vocational qualification in their own right. This is an interesting example of the sort of "hybrid" educational form—part-vocational, part-academic, part-technical, and dealing with "non-traditional" HE students—encouraged by the diffuse nature of ICT. Yet even on a degree where ICT was the focus, there remained problems with embedding the necessary skills into both educational and organisational structures. People cannot be forced to use ICT in particular ways: they must be encouraged to find their own uses of the tools. Peters also introduces ongoing research into Foundation Degrees, conducted via an HEA-sponsored questionnaire.

5. Conclusion

Concern over the teaching of ICT is not just a local problem but touches on the role of the university in 21st-century society. Are academics just to be observers, seated in the proverbial ivory tower and watching developments from above? Even without the current pressures from commerce and government which discourage such detachment, I suggest this stance is not tenable when talking about ICT and information generally. McPherson and Nunes follow Viau by saying, "since information has become a dynamically changing, random access flood, it does not help to try simply to learn about it: today's students must learn how to *shape* it" (McPherson and Nunes 2004. p. 40, following Viau 1994). ICT are amongst the tools that help us shape the rapidly accumulating stock of human knowledge and culture. If universities, deliberately or through neglect, absolve themselves of this responsibility, the future is a bleak one indeed. Despite the problems which exist in integrating ICT into HE, it is a process with which we must engage at some level if the position of universities is not to be still further undermined.

The papers presented in this collection provide useful data, but like so much work in this area they remain, mostly, studies of a single university (although Rae's use of external comparative data is acknowledged). To accompany this issue of *ITALICS*, an online survey has been placed at <http://www.comp.leeds.ac.uk/hea/>. It is hoped that this will contribute towards a more comparative study. We welcome all responses to these questions and hope that this can provide further insight into the state of ICT skills education.

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