The Role of Vendor Qualifications in Developing Digital Literacy for the Information Society

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Abstract: The roles of worker and citizen demand that all school leavers be digitally literate. The recognition of this has resulted in ICT education beginning in primary schools. In a number of areas IT companies are working with educational establishments to integrate vendor qualifications into the curriculum. This paper considers the rationale for the introduction of such qualifications and considers one particular example. It debates the contribution such an initiative is likely to make to the perceived UK skills shortage and to the critical thinking ability required for citizens in the Information Society.

Keywords: ICT, curriculum, skills, vocational, digital literacy, vendor qualifications

1. Background

The existence of a skill gap in the workforce is not a new phenomenon but acceleration in technical developments and the globalisation of economies has meant that planning a response to it has become more urgent. A report from the European Commission, ICT Skills Monitoring Group (2002) indicates that there are two particular issues that are a cause for concern. Firstly, a skill gap tends to widen social divisions and secondly, shortages in ICT skills, and mismatches between the technical skills available and the technical skills required, present a barrier to productivity. For despite suffering from recession like Europe, the US has been improving its productivity and this rise is linked with an increase in the use of IT.

Recognition that the role of both worker and citizen demand that all school leavers be digitally literate has resulted in ICT education beginning in primary schools. ICT has been well embedded into the UK national curriculum at all stages in order for students to develop the necessary ICT skills and cognitive abilities. Considerable support and guidance has been offered particularly in the shape of the Key Stage 3 ICT strategy. There is also an acknowledgment that ICT can offer an effective environment for learning in a wide range of subjects and hence the National Grid for Learning has been developed and in some areas local e-Learning platforms have been put into place.

Various academic and vocational qualifications and certification frameworks have been introduced and implemented over the last 30 years. Halstead (2003) traces the changes in policy within education moving from a model of personal growth and self-realisation in the 1970s, to increased control and a much stronger instrumental function for education linked to employability and accountability during the 90s. One of the aspects of the emphasis on employability is the integration of vendor qualifications into the curriculum. This paper explores the proposition of incorporating lower level vendor qualifications into secondary schools' curricula. We investigate the rationale for their introduction and consider whether they are likely to contribute to the perceived UK skills shortage. We also ask whether we are focussing on developing students' skills to the detriment of their wider cognitive abilities and whether we are developing the necessary critical thinking ability for the Information Society. Finally, we consider whether current students are motivated to study ICT at higher levels and thus develop the professional skills that will be required in the future.

This paper begins by describing the project, then moves on to discuss the literature relating to e-Government initiatives and the skills needed for an Information Society and this is followed by considering the role of ICT in schools. We then move on to consider frameworks which will help to structure our findings and then responses are categorised and drawn together in the final discussion section.

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2. Vendor qualifications and the project

Across Europe companies such as Cisco, Oracle, SAP, Microsoft, IBM and Intel are linking with governments, with schools and with universities to deliver vendor qualifications (European Commission, ICT Skills Monitoring Group 2002). In the UK the Qualifications and Curriculum Authority (QCA) has been working with vendors to incorporate their qualifications in order to enable students to gain dual accreditation (Wood and Revill 2004) and the Microsoft Word Core Curriculum has been integrated into the OCR level 2 National Certificate in IT.

This research reports on a curriculum development project funded by the Learning and Skills Council (LSC) in the South Yorkshire area. We were tasked with preparing suitable curriculum materials to teach 11 to 18 year olds the Microsoft Office Word (MOS) core curriculum in order to prepare them to pass the MOS vendor qualification. This qualification is assessed via an on-line examination provided through a number of distribution agencies. Whilst Microsoft has produced both paper based and interactive learning material, their material is aimed at adults. This project linked with a large European funded project providing hardware for schools and developing a local e-Learning platform. As part of this schools were set targets that two teachers in every school should be trained on all Microsoft Office packages and each school negotiated a target number of units to be passed by students. Each of the target units could be achieved by a student passing either one MOS exam or half (four of the eight units) of the full European Computer Driving Licence (ECDL) qualification. ECDL is perceived by teachers as a lower level, but more wide ranging qualification, thus MOS is seen as an easier option for students who know one package well.

A series of fact-finding meetings were held with members of local education authorities and the Learning and Skills Council. There were also discussions with managers in further education (FE) and with teachers in school and FE. There was some classroom observation of teachers and trainee teachers and focus groups were held with small groups of year 11 students.

3. Skills and digital literacy

e-Government initiatives in Europe have strong underlying economic and competitiveness agendas, together with a strong emphasis on effective citizenship and social inclusion (HMSO 1999). For example the Action Plan for eEurope 2005 (Commission of the European Communities, 2002) specifies the aim to make the European Union *the most competitive and dynamic knowledge-based economy with improved employment and social cohesion*. There is an emphasis on enabling e-Government, e-Health, e-Learning and e-Commerce through the means of cheap, fast and secure Internet access and the acknowledgment that this development must be fuelled by the provision of skilled workers. There is some evidence that a better educated workforce creates productivity gains and in the United States the proportion of the population classified as skilled has risen from 20% in 1950 to 60% in 1997 (Servon 2002).

A report on the skills shortage across the European Union (European Commission: ICT Skills Monitoring Group 2002, p8) begins by classifying ICT skills into three categories. The first category is 'professional skills' which are defined as *the ability to use advanced ICT tools and /or develop, repair and create them*. The second category is 'user skills' which are described as the use of workplace specific tools such as banking information systems or Customer Relationship Management systems in the retail sector. The final category encompasses the use of basic ICT tools, for example use of the Internet, email and generic packages such as word processing and spreadsheets; this category is labelled 'digital literacy'. '*Digital literacy relates to the ability to grasp and use information as presented on a computer installation…Being digitally literate implies being able to search and retrieve information, to navigate and communicate on-line, to participate in digital and virtual communities.'* (European Commission: ICT Skills Monitoring Group 2002, p12).To date, much of the research in skills shortages has concentrated on professional skills and little work has been

undertaken in relation to the other two categories.

The professional skills category has within the last few years developed a negative image due to high staff turnover and high levels of redundancy. This is at least partly because the sector tends to take on new staff to fill skills shortages rather then retrain existing staff. Keeping up with rapid changes in technology is a significant challenge for workers in this sector. But while some workers have been laid off there are areas where demand for skilled workers remains high. The picture is not as bleak and risky as it may appear as there is still high demand for professional ICT skills in other sectors than the telecommunications and computer services sector, for example in real estate, business and health and social services. And whilst there has been unemployment amongst ICT professionals there is a strong demand for business skills allied with ICT.

Much of the analysis pertaining to skills shortages to date has focussed on the shortfall in professional skills, both within the ICT sector and outside it, but the proliferation of PC usage across a wide profile of businesses implies that a much larger proportion of workers than at present will need to be digitally literate. ICT no longer represents a sector in its own right but has become a set of specialist skills demanded across all sectors. In 2002 75% of the workforce in the UK used a PC at work and to maintain that proportion demands an increase in ICT users of 1.6 million by 2009, and to increase the proportion to 95% would demand an extra 7.3 million ICT users(European Commission: ICT Skills Monitoring Group 2002).

In addition to this we must recognise that digital literacy is required for everyday activities as information is a critical resource (Corrocher & Ordanini 2002). It is not only commercial businesses and public sector organisations that depend upon information but also individuals who have many more choices available to them and with greater choice comes increasing complexity. Although the principles underpinning e-Government developments focus strongly on making services available through a variety of easy to use interfaces we should not underestimate the abilities needed to make effective use of e-Government facilities. Not only is information perceived as a public good to which all should have access but local authorities are also using their websites, not only to facilitate transactions and inform their citizens, but also to consult with them and enable them to exercise their democratic rights (Horrocks and Hambley 1998). However, even when people have access to the Internet it does not mean they choose to use it. Whilst some research indicates that people are nervous about using the technology others simply see no valuable reason to use it (Foley et al. 2002). Here, we have an issue not just of having the necessary skills but also of having the motivation. If we concur with Servon (2002, page 21) who contends that *the skills necessary to work, prosper and participate in current society are intrinsically bound up with the ability to use information technology tools* then we must demolish these barriers especially for the generation currently in primary and secondary education.

The UK Government has argued for some time that we need workers with broad-based and transferable skills for an Information Economy. This was the intention when National Vocational Qualifications (NVQs) were introduced in 1986. Williams (1999) contends that the narrow and context dependant nature of NVQs was the result of a pragmatic linking with Youth Training Schemes in order to hit targets and was not the original intent. This intention to produce workers with broad-based and transferable skills is still held by the present UK Government and can be discerned in the consultation document for the e-Learning Strategy (DFES 2003) which aims to prepare a professional workforce as well as fulfilled citizens. It asserts that it is necessary to produce a population capable of continually updating their knowledge and skills. Worries associated with globalisation and the off shoring of many jobs has led to the intention to develop a strong knowledge economy. In addition to the requirements for highly educated knowledge workers this demands a significant workforce with technician skills to maintain IT equipment locally. The importance attached to lifelong learning and application of ICT to develop skills for the economy can be seen in the UK Government's support for the National

Grid for Learning and the desire to produce the best educated workforce in the world (Gorard and Selwyn 1999; Selwyn and Fitz 2001).

The use of computers in the classroom has a twenty year history which is traced by Somekh (1999) and by Watson (1997). Initial beliefs that computer assisted learning would improve teaching and produce efficiencies (Hooper 1977) have largely been discarded with a perception that the role of IT within education, in addition to being a subject of study in its own right, is -as a tool, -as a communication device and -as a means of access to a wide range of resources. While computers of some sort have been used in schools for at least 20 years the significant uptake of ICT as a GCSE subject in any numbers has been fairly recent. Computing 'O' level was certainly available in some schools as early as 1973 when students used the local polytechnic mainframe computer to run their programs and IT was a GCSE subject using PCs by 1992. However, in a paper by Bell (2001) which reports on the proportion of students taking different subject options in 1997, ICT is not mentioned, whereas by 2002 it was widely studied (Colley and Comber 2003). For many years the number of students enrolling for computing and information systems courses in HE has been rising but there has been a drop of 25% in the number of applicants to UK university computing courses in 2003/4; following a less severe decline over the previous two years. This is an issue of concern to university computing departments. Various arguments are advanced for this drop, they refer either to supply side problems related to changes in the school curriculum or to the demand side and the downturn in the IT job market.

4. Educational frameworks

Here we explore three frameworks that are applicable for analysing the responses of participants. Firstly Saunders (1993) suggests that the curriculum can be assigned two types of value. He bases his model on the work of Marx who proposed the notion of value in relation to the economic base of society. Goods can have 'exchange value' and this is the value they have for sale or exchange regardless of the need for them. This view perceives goods as commodities. But instead, or indeed as well, they can have 'use value' which relates to their intrinsic usefulness. He suggests that curricular forms that have high use value, either to citizens themselves or to their potential employers, must also be given exchange value if they are to survive.

Secondly Halstead (2003) traces the changes in policy within education over the last 30 years. During the 70s educational institutions focussed on personal growth and self-realisation, the *individual, idealistic model*. In the 1980s there was a period of intense reform emphasising shared social value. We saw the introduction of the national curriculum and key stages for education, together with attainment targets, testing through Standardised Attainment Tests (SATs) and of course school inspections. League tables and accountability demonstrated a commitment to shared values, common goals and state control, this was the *social coherence and idealism model*. In the 90s there was increased control and a much stronger link being forged between employability and education. There was significant ideological shift from perceiving an intrinsic worth to education to valuing its instrumental role. The emphasis was on citizenship, collective responsibility and education for the development of society, this was the *social coherence and pragmatism model*. Now with the desperate shortage of teachers, we see the use of classroom assistants, and flexible PGCE programmes. There is also a lighter touch in a number of areas for example the permission to 'disapply' the National Curriculum to certain students in order to introduce vocational qualifications (DFES 2002) and an encouragement for diversity through initiatives such as the creation of specialist schools. Thus we move into the *individual, pragmatic model*.

Finally Scott (1995) discusses the move from mode 1 to mode 2 knowledge which is basically a move from 'knowing that' to 'knowing how'. Within higher education this has included a swing from courses to credits and the recognition of the need for routes for progression as we shift from an elite to a mass HE system. The discourse associated with credits and progression is seen as part of the commodification of learning linked with the 'exchange value' of education.

5. Responses

(i) Curriculum Managers

This group comprised local authority representatives, FE managers and Learning and Skills Council representatives. The main rationale they advanced for the development was the skills gap and the demand for sub-degree technicians. They concentrated on the way in which the MOS qualification could be fitted within a wider range of qualifications available for students such as GCSEs, GNVQs and Key Skills qualifications. Their discourse revolved around pre-requisites, levels and dual qualifications. There was considerable discussion about where the course fits into the framework of delivery and this aligns with Scott's (1995) mode 2 description. The managers in the FE college believed that employers would value the qualification i.e. it would have strong exchange value and they felt that thus it would also have high exchange value for the students and help to motivate them.

We spoke to a contact in another local authority in the south of England that had been running Microsoft courses in schools for some time. Some of the courses had been aimed at older students, especially sixth formers taking MOS as an additional qualification to bolster their 'A' levels but the authority had aimed courses primarily at adults. This activity had been successful on a number of fronts. Firstly it had helped to open up the schools to community activity, secondly it had raised small amounts of money for the schools, thirdly it had helped the local authority meet some of its adult training targets and finally it proved a good way to encourage adults back into education.

We can see that managers focus on the 'exchange value' of such qualifications and use the discourse of the commodification of learning. They also take a pragmatic approach and keep a weather eye on accountability issues such as the targets that have to be achieved.

(ii) Teachers

Teachers accepted the principle of integrating the qualifications and using support material in order to do this. Ideally, they wanted the material to be differentiated for different age group and extension and practice material to be available. There were opposing views regarding whether the qualification would be taken by able students as an add-on or by less able students to support their employability. Most of the discussion revolved around how the course could be fitted into the curriculum. Suggestions were that it could be attached to the OCR CLAIT course, used during lunchtime or after school activity, taken as part of the Key Skills curriculum during GCSE or sixth form study, or slotted into the period after SATs in the summer.

In the appendix you will find some examples of national curriculum ICT learning outcomes and some of the MOS objectives. We mapped our materials against both of these. It was possible to situate the MOS objectives within tasks that allowed achievement of the NC learning outcomes. The national curriculum learning outcomes are far more generic than the MOS objectives and are focussed not only on carrying out a task but on understanding why one is completing the task and making judgments about the most appropriate way to undertake it. The NC outcomes are also expected to be carried out across a wide range of contexts and this raises other concerns, which are explored below.

The trainee teachers who were observed demonstrated strong ICT subject knowledge. However, weaknesses were perceived in applying these skills across a broad context. Examples include: the young trainee who can use a spreadsheet but does not really understand the rationale for using percentages rather than absolute numbers; the trainee who is teaching about the use of corporate logos with no understanding of marketing or of design principles; the trainee who does not understand the business example which the class teacher expects her to use as a spreadsheet exercise and finally even the mature student who cannot spell accurately. There are two problems here; firstly despite the literacy and numeracy requirements for all Initial Teacher Training applicants incoming teachers have weaknesses in these fundamental areas. Secondly, the ICT teacher is increasingly being required to teach about the use of software across a very wide application area without necessarily having the contextual knowledge to do so effectively.

Although the teachers show an awareness of the commodification of learning and the 'exchange value' of education they concentrate on discussing the practicalities of teaching. They readily accept the integration of vendor qualifications but they do perceive a conflict between the generic outcomes required by the national curriculum and examination board qualifications and the more low level but prescriptive objectives of the vendor qualification. A number felt very strongly that they did not want any more 'how to use Word' material.

(iii) Students

Secondary students demonstrate confidence using computers and often experiment in order to find out how to use a package. ICT was used in many of their subjects of study and all of the students interviewed had a PC at home. The discussions with students explored their views on studying ICT both at school and in the future. The most common reason advanced for choosing ICT as a GCSE subject was enjoyment of the subject. This was often closely linked to their competence at the subject and their expected grades. A number felt that if they were interested in something then they were 'half way there' in terms of their performance. There was also a keen awareness that basic ICT understanding was useful for whatever they went on to do and that studying ICT would give them a 'head start' with the constant advances in technology.

Students emphasised the 'use value' of education and the importance of enjoyment and they often had a career in mind though some were keen to know that gaining certain qualifications would help them to keep their career options open should they change their mind. Although they referred to the need to be able to use a computer rather than have a qualification, there was a reference to the 'exchange value' implicit in the discussion of doing well and gaining good grades.

While a number of students clearly enjoyed ICT there were a number of negative images. One frequently repeated observation was that there was duplication and repetition of material leading to boredom. In particular there was overlap between the GCSE in Business Studies and the GCSE in ICT. Rarely was there any reference to the subject being either difficult or challenging. While there were different preferences in terms of the packages used and the contexts chosen, a number of them commented that they were happy setting up databases but unhappy at having to write down how they had done this.

When discussing whether they might pursue a career in computing some of them were aware of the high number of computing graduates and the fact that jobs such as those occupied by the technicians in their school did not pay highly. None of them referred to insecurity in the IT job market. Once again their choices were governed mainly by what they enjoyed doing. 'If it interests you, you'll do better, if you like it you're 50% there, it's like football you need to have your heart in it'. They were often resistant to careers in the computing area perceiving the job as spending the whole day sitting in front of a computer. They demonstrated a healthy sense of realism 'well, you need a job to live'. But they claimed that high salaries were not very important, more important was doing something that interested them.

6. Discussion

The integration of vendor qualifications into the school curriculum is clearly part of the linkage between education and employment that has been prevalent in recent years (Halstead, 2003). The rationale advanced by funders for the integration of MOS qualifications is to satisfy the demand for low-level technicians. However, the type of vendor qualification being discussed within this project fits more accurately into the category of 'digital literacy' than low level 'professional skill'. So it is debateable whether the outcomes of this project could satisfy this demand although they could help to underpin it.

It is clear that the activities in schools which include the incorporation of basic ICT skills in the national curriculum, funding linked with achieving targets related to ECDL and vendor certification, and incorporation of vendor certification into national qualifications all seek to develop 'digital literacy' in all school leavers. However, the question is posed. Will the shortfall in professional ICT skills

be exacerbated by the dropping number of graduates in the next few years due to the recent downturn in university recruitment? In turn is this affected not only by the volatile nature of employment in the ICT sector over recent years but also by potential recruits being deterred from more technical courses by their school ICT experience?

Another issue to consider in assessing whether this initiative will improve 'digital literacy' is the possibility that MOS exams will be taken by more able students to contribute to their development and provide them with additional qualifications for university entrance. If this is the case then this initiative may not increase skills although it may accredit some of the skills already being obtained and generate dual qualifications. It is possible that, in the current accountability culture, targets will be achieved but this will not necessarily reflect any increase in skills levels and the proportion of people with few or no qualifications may well remain stubbornly constant.

Next we ask whether this initiative focuses on developing students' skills to the detriment of their wider cognitive abilities. The generic learning outcomes of the national curriculum, including the demand for reflection and evaluation, suggest that we are aiming to develop the necessary critical thinking ability for the Information Society. Although the objectives of the vendor qualification do not demand this level of critical thought they do provide the very necessary skills required to utilise a software package and upon which such outcomes can be built. Perhaps a more worrying proposition that emerges within this paper is that ICT teachers are not fully equipped to do more than just develop their students' basic ICT skills.

This leads us finally to the issue of motivation. The message, given by planners, that the use of vendor qualifications is needed as an exchange mechanism in order to motivate many students reinforces the view that intrinsic motivation, through enjoyment of the subject, is often insufficient. The overriding driver for students in choosing a subject to study is their enjoyment of the subject and it would seem that repetition of topics and unenthusiastic teaching in some schools may well be impacting on the desire of young people to pursue further study and careers in the ICT area.

7. Appendix

National Curriculum key stage 3 learning outcomes (examples):

- analyse the requirements of tasks, taking into account the information they need and the ways they will use it;
- use ICT effectively to explore, develop and interpret information and solve problems in a variety of subjects and contexts;
- consider how the information found and developed using ICT should be interpreted and presented in forms that are sensitive to the needs of particular audiences, fit for purpose and suit the information content;
- evaluate the effectiveness of their own and others' uses of information sources and ICT tool, using the results to improve the quality of their work and to inform future judgements.

MOS objectives (examples):

- Insert page breaks;
- Highlight text in document;
- Insert and move text;
- Cut, copy, paste and paste special using Office clipboard.

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