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The Use of ICT in Business and Economics in 2005

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Introduction

This article reports the findings of the latest 5-year survey of computer use among EBEA members. Our questionnaire was distributed to the 1160 individual members of the association in the autumn term of 2005. There were 187 returns, giving a response rate of 16%. We are grateful to all of those who took the trouble to reply and feel that they provide an interesting picture of the current EBEA membership and their views on the role of ICT within Business and Economics Education.

Respondents and their institutional setting

The median age of respondents is 44 years, with a half falling between the ages of 34 and 50. They have an average of 9 full-time years in teaching; a quarter is in the first three years of teaching and the remaining quarter has over 20 years in the profession. Almost a quarter of respondents have taught part-time for some or all of their careers. The overwhelming majority of these were women. Unlike earlier surveys, replies were evenly spread on gender lines with males accounting for 50.8% of respondents and female teachers 49.2%. This reflects the gradual switch in emphasis from economics, which tended to be male-orientated, towards business studies, which attracts a higher proportion of female teachers.

The schools and colleges

Just over one-fifth of replies (20.9%) are from colleagues in the independent sector. The remaining four-fifths (79.1%) teach in state schools.

The median size of institution is 1200 students, with 50% of members in schools between 800 and 1400. Almost all EBEA members (95.4%) are in schools with sixth forms - 50% having between 148 and 300 sixth-form students.

14 respondents (8%) teach in Specialist Business Schools or Colleges.

Departments

A quarter of respondents are in departments of one, a half are in departments of between 2 and 5 staff and the remaining quarter teach in large departments with 6 or more members of staff.

The majority of departments have at least one person teaching business studies and a half of all departments had between 2 and 4.75 full-time equivalents teaching solely Business courses.

Almost a third of respondents (31%) were in departments with one economics specialist and a further 27% have two economists.

Departmental Resources

Budgets

In the 2005 survey we asked respondents, for the first time, to tell us about their departmental budgets. We felt that this information would be useful to members for purposes of comparison and perhaps to lobby for additional resources. These figures have to be used with care as student numbers are bound to differ as will school spending practices at departmental level.

In 2005 the average departmental budget, based upon the median value, was £1500, with 50% of departments reporting budgets between £900 and £2500. The lowest departmental budget reported was £150 and the highest £25,200 (although one suspects that the latter included the cost of a new ICT suite).

Departments typically spend 50% of their budget on books, with a half spending between £320 and £1200 per year on books and other print-based resources.

Three-quarters of respondents are in departments with 3 or fewer teachers and the pattern of expenditure in such departments is summarised in Table 1.

Table 1 Departmental budget by number of staff (mean values)

Number of staff	1	2	3
Budget 2004-5	£1290	£1730	£2132
Book expenditure	£625	£873	£956
ICT software expenditure	£196	£178	£206

Only a tiny minority of departments were required to buy computer hardware from their departmental budgets. However, roughly 10% of budgets went on computer software – though it was not clear how many departments were counting the use of *e-learning credits* within this amount. High spending departments tend to skew upwards the mean spending figures. The median expenditure of all respondents on software and licenses was £112 in the year, somewhat less than the mean. Similarly, median book expenditure was £600 across all departments. It is evident that software is essentially a fixed cost element regardless of departmental size, whereas book expenditure varies with the size of department.

Computers, software and books

A typical business department has 15 networked computers with internet connections. One-quarter of respondents, however, are in departments with 1 or no PCs. Another quarter has departmental access to over 36 PCs.

Over a half (56%) of respondents claim to have very good access to networked computers, while one-quarter has poor access. While one quarter of teachers has very good access to an interactive whiteboard, one-third has no such access and others have relatively limited access. Less than a tenth of respondents are satisfied with their personal access to specialist business and economics software. In contrast, a half of teachers indicate that the availability of specialist software in their school is inadequate, while over a tenth of respondents claim to have no economics and business software whatsoever within their schools. Perhaps more surprisingly, less than a half (46%) of teachers claim to have an adequate supply of books and print publications, and 15% of respondents believe these to be most definitely deficient.

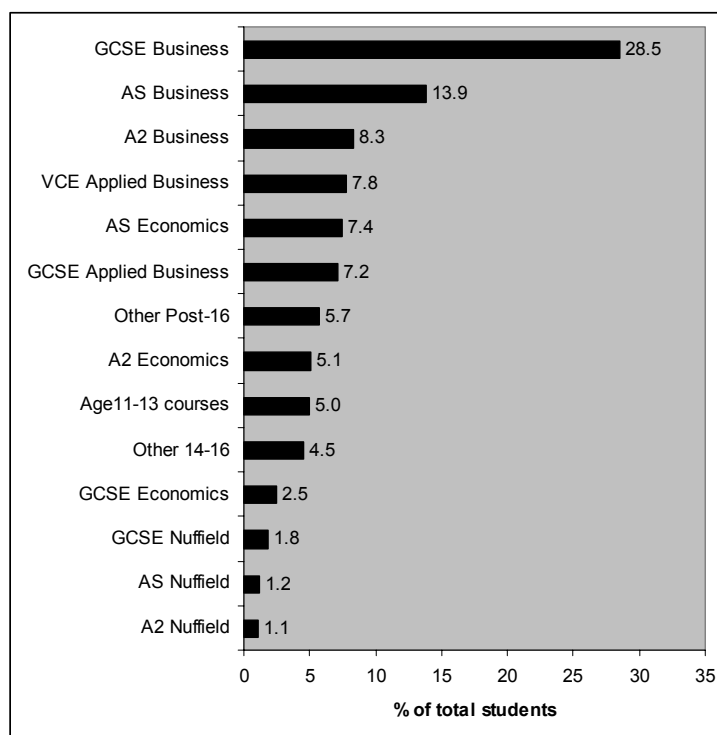
In this survey we also have asked EBEA members to give an indication of how much ICT-based work they do at home. We were not surprised to find that over 93% of members use their home computer for work purposes, spending on average more than 8 hours a week (median = 7) preparing school work. Use varies between individuals; 11% report spending

three hours, 18% five hours, 23% ten hours and 3 individuals clock up over twenty hours each week using their home computer for work purposes.

Courses and students taught

The questionnaire provided data on the number of students taught by respondents on different courses and the proportional breakdown of this is displayed in Figure 1. GCSE and A-level Business Studies accounts for just over a half of EBEA members' workload, measured on the basis of total students taught. Economics now accounts for only 15% of students, the same as Applied Business. The Nuffield courses, which combine economics and business, account for another 4.1%, with the remaining 15% of students being on various courses at different levels. This represents a major reorientation of the workload of EBEA members since the last survey was conducted 10 years ago. At that time Economics and Business courses were fairly evenly balanced.

Figure 1 Distribution of students taught by EBEA members



Student use of ICT

Table 2 records student numbers and ICT use on different business and economics courses. Respondents were asked only to record the numbers for the courses they personally taught in the year 2004-5.

It is evident from the table that 75-80% of economics students are male, while the business courses have a more even gender balance. There is less variation in average class sizes between the different courses than 10 years ago, although the business classes remain a little larger than economics ones.

Figure 2 displays the mean values of ICT use and Table 2 the median values; the latter are generally lower, which suggests that the mean values are inflated by high levels of use by a smaller number of teachers. AS and A2 Nuffield courses show the highest median levels of ICT use in lessons. This is undoubtedly a measure of the Nuffield Project's success in developing ICT activities that are tailored to the course and fully integrated with the course

textbooks. The Nuffield software is among the few remaining pieces of published economics and business software available on CD-Rom. Applied business courses, however, are the highest users of ICT on the basis of mean values. This almost certainly reflects their ability to reward time spent on ICT within the course assessment. Correspondingly, the fall in ICT use in GCSE business studies reflects the fall in the weighting of course work in assessment compared with 10 years ago. Larger coursework elements tend to reward ICT use, whereas reliance on end-tests militates against more active uses of ICT and encourages those applications that support knowledge consolidation and exam revision. The growing availability of computer facilities in schools has led to an increase in ICT activity in private study time and at home. This is illustrated in Figure 3, which shows the mean values of different uses. The pattern broadly follows that of in-class use, except that there tends to be an additional hour of out-of-class use for every 3 to 5 hours of in-class use; although this varies somewhat from course to course. The growing expectation that students will use ICT for supplementary out-of-class work is a very positive development. However, it does raise questions about how we ensure equitable access to ICT for students with poor or no access to internet-enabled computers at home.

Table 2 ICT use by courses taught (median values)

Courses taught	Average number of students taught	Percent age of Girls	Average class size	ICT use in lessons Hours/student/Year*	Out of class ICT use for set work Hours/student/year	Number of respondents
11-13 years courses	47	50	26	30 (19)	3	10
GCSE Business	43	40	24	20 (33)	15	88
GCSE Economics	40	25	22	10 (6)	10	9
GCSE Nuffield	29	35	21	21	14	8
GCSE Applied Business	21	30	20	50	20	39
AS Business	20	40	15	10	16	90
AS Economics	17	25	12	10	10	56
AS Nuffield	17	25	17	50	30	9
A2 Business	15	40	12	10 (16)	20	75
A2 Economics	12	20	10	10 (6)	12	55
A2 Nuffield	13	30	13	60	30	11
VCE Applied Business	17	35	14	50 (100)	30	65

* Figures in brackets are for equivalent courses 10 years ago in 1995.

Figure 2 ICT use within lessons by course (mean values in hours)

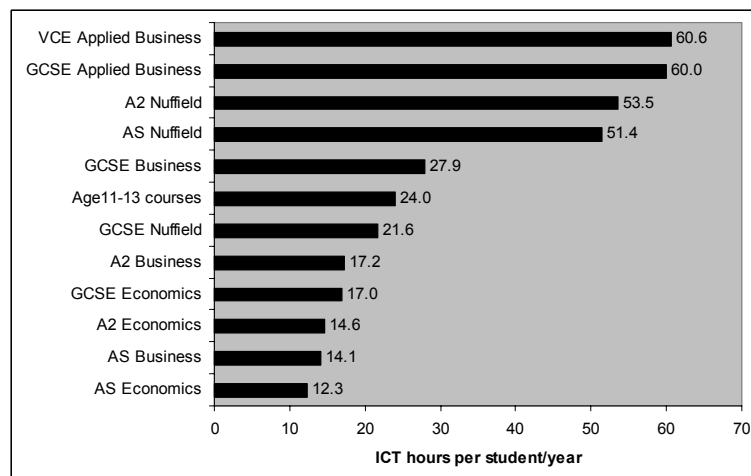


Figure 3 ICT use out-of class by course (mean values in hours)

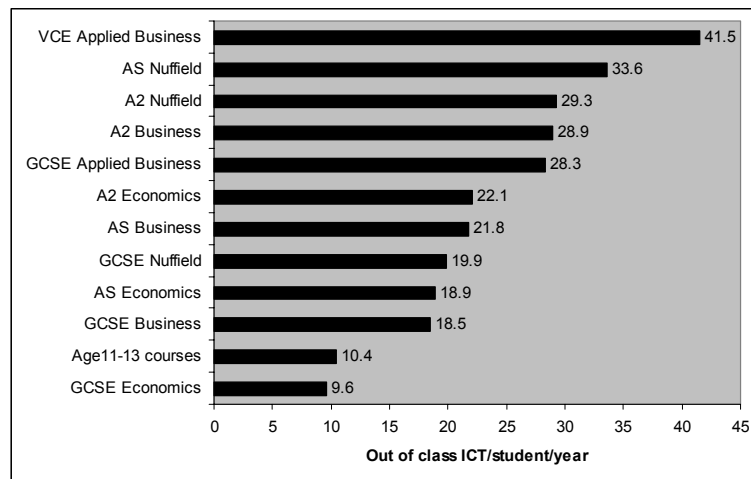


Table 3 shows how the level of ICT use by teachers varies according to the courses taught. The columns represent the average level of computer use by the lowest and highest quartile (25%) of teachers. The differences are quite substantial. One-quarter of AS business teachers did not make any use of ICT during the year; in contrast, the highest quarter employed ICT for 20 hours of lesson time. In GCSE business studies, the lowest quartile used ICT for 10 hours, a quarter of the level of the highest quartile of users. Applied business courses show the highest use, followed by the Nuffield courses. However, at A2 level, a quarter of Nuffield course teachers found they could make do with as little as 2 hours of computer use in the year. This would support the conclusion that teachers perceive there to be a weak relationship between ICT use and performance in the final assessment.

Table 3 Variations in ICT use among teachers

ICT hours in lessons	Lowest Quartile	Highest Quartile
11-13 years course	5	37
GCSE Business	10	40
GCSE Economics	2	28
GCSE Nuffield	7	36
GCSE Applied Business	22	78
AS Business	0	20
AS Economics	3	15
AS Nuffield	18	74
A2 Business	2	25
A2 Economics	4	20
A2 Nuffield	3	90
VCE Applied Business	21	98

Just over a quarter of respondents (26.5%) report that computers are used only occasionally to vary the teaching style. In contrast, almost three-quarters (73.5%) now regard ICT as an essential element of their teaching.

The uses computers and sources of knowledge

The first part of Table 4 shows that much of the computer use in business and economics relies upon gaining access to a room with networked computers. Out of class use by

students in their own time is also widely expected by teachers. Over a half of teachers have access to interactive whiteboards for whole-class focused work using PowerPoint and other software, although the supply of dedicated business and economics software for IWBs is clearly limited. Relatively few teachers use single computers within class as part of a circus of activities, and computer moderated team games, which were once relatively popular, are now used only occasionally by less than a quarter of teachers.

Table 4 Patterns of computer use

Computer organisation (%)	Main use	Common use	Occasional use	Never
Whole class using networked computers	43	29	22	6
Private study use outside normal classes	14	55	22	9
Interactive whiteboard with PowerPoint	13	35	20	32
Interactive whiteboard with other software	6	22	24	48
ICT as one of a circus of activities	2	17	43	38
Team game played in groups	<1	<1	24	75

Computer applications (%)	Main use	Common use	Occasional use	Never
Word processing	51	38	8	3
Using the Internet	29	44	24	3
Spreadsheets	7	40	36	17
Data bases	4	20	53	23
Data analysis	3	16	48	33
Computer games	2	6	34	58
Testing students	2	7	30	61
Conferencing	2	9	22	67
Self-paced tuition	1	12	33	54

The main current uses of ICT are for word-processing and accessing the internet. Arguably word processing has brought about substantial improvements in the quality of course-work writing and presentation and the Internet has opened up a hitherto unimagined wealth of source material which far exceeds the offerings of school libraries. The Bized and Tutor2U web sites are the two most important web portals used by business and economics teachers, followed by national government sites and those of statistical organisations such as National Statistics, the World Bank and OECD. One aspect of ICT use which, while still relatively underdeveloped, holds out promise for the future, is internet conferencing. This holds potential for students to work on collaborative projects in different parts of the country and internationally.

Few who were involved in the early pioneering days of computer-assisted learning in the 1970s could have envisaged the current outcomes from almost 30 years of computer-based learning evolution. The early focus on building computer games and simulations to allow students to explore the properties of models and trade-offs between objectives seems not to have stood the test of time. Business and macro-economic games that gained early popularity appear to have had neither the cost-effective learning potential nor, and relatedly, sufficient market prospects to warrant their transfer to the PC platform. With the ending of public funding for educational software development commercial publishers turned their attention elsewhere. Similarly dedicated database products could not compete with free resources widely available on the internet. Computer applications that consolidate and test knowledge have proved to be expensive and offer few relative advantages over text-based media, including sophisticated modern textbooks.

Table 5 Sources of knowledge on ICT

On using ICT	Very important	Important	To some extent	Not at all
ICT and other staff in your school/college	17	33	38	12
Initial teacher training	10	12	26	52
Degree course	8	9	20	63
Government sponsored NOF training	2	4	13	81
EBEA courses/publications	2	13	35	50

On educational software	Very important	Important	To some extent	Not at all
Colleagues	18	38	34	10
Publishers' literature	12	32	40	16
EBEA journal	9	26	50	15
EBEA meetings and conferences	2	9	24	65
Other meetings/conferences	7	12	26	55
Other sources	6	10	10	74

Table 5 provides evidence of a public failure in knowledge dissemination. On the general use of ICT teachers still largely rely upon their colleagues to keep them abreast of new developments. Even in 2005 very few teachers attribute their knowledge to their degree courses, teacher training, government sponsored training or, indeed, to the activities of their professional association. Knowledge of educational software and media relies almost exclusively on word-of-mouth attestation by colleagues supported by the somewhat 'partial' literature produced by publishers.

Use and limitations of ICT

When teachers are asked to assess the educational contribution of computers the major emphasis is upon generic objectives, see Table 6. Students as well as teachers are believed to enjoy computer-based lessons and the use of computers in lessons is thought to improve attitudes towards the subject. Many teachers believe that they have a duty to give students experience of using micro-technology. There is also an acknowledgement that ICT can free the teacher to help students on an individual basis, and so provides a valuable change from the essential group focus of whole-class teaching.

Table 6 The educational contribution of ICT

	Strongly agree	Agree	Neutral	Disagree
Students enjoy computer-based learning activities	32	57	10	<1
Improve general attitudes towards the subject	23	48	25	4
Familiarise students with micro-technology	17	49	27	7
Allow the teacher time to help individual students	16	54	20	10
Teachers enjoy computer-based lesson	14	46	31	9
Increase awareness of complex decision making	8	33	45	14
Improve analytical and critical thinking	7	28	50	15
Improve data interpretation skills	7	52	35	6
Improve performance in assessment/examinations	6	36	43	15
Help the development of oral discussion skills	6	19	45	29
Develop decision-making skills	5	35	48	12
Improve arithmetic skills	3	14	47	36

ICT contributes to a number of subject-related objectives such as developing an awareness of trade-offs in decisions (a skill that is particularly fostered by the use of case studies, games and role plays – which are now, apparently, all too rarely employed); over a third of teachers believe that ICT can help to develop analytical and critical thinking; and more than a half believe that computers help with data interpretation skills. Relatively few, however, believe that ICT improves arithmetic skills. This presumably stems from relying too much on

computer applications, such as spreadsheets, to perform simple computations. A low proportion of teachers see ICT as a vehicle for improving oral discussion skills, though this probably reflects the current preoccupation with word processing and the internet rather than anything inherent in the medium of ICT. 42% of respondents believe that the use of ICT enhances examination performance. However, if this were true for business and economics then we would stand out from other subject areas where there is very little convincing evidence that greater ICT use enhances examination performance. This may reflect the fact that teachers are using ICT because they feel they are expected to do so or because they are trying to achieve wider educational goals that are poorly rewarded in assessment schemes.

Table 7 Factors limiting the use of computers

	Strongly agree	Agree	Neutral	Disagree
Too few computers in school/college	42	25	12	21
Problems of access to existing computers	40	34	11	15
Too little money to buy software and licenses	33	35	18	14
Insufficient information on software	28	38	21	13
Insufficient range of quality software	27	36	25	12
Unreliability of hardware	26	34	20	20
Teachers' lack of confidence in using computers	22	40	20	18
Software is poorly related to syllabuses	21	40	27	12
ICT use is not rewarded in course assessment	21	26	34	19
Unreliability of software	19	32	27	22
Internet sites are often inappropriate for student use	11	34	29	26
Software/CD-ROMs have insufficient guidance on use	11	33	36	20
ICT requires too much preparation/follow up time	11	29	30	29
There is too much emphasis on the use of ICT	11	24	33	32
ICT take too long to make obvious points	12	19	35	34
Books and print publications are more useful than ICT	10	19	53	18
Lack of technician support/ancillary help	13	22	28	37
Lack of commitment to ICT in school/college	8	18	25	49
Students' lack of confidence in using computers	5	15	29	51

In the past 20 years there has been an enormous investment in ICT hardware and software by schools and a considerable amount of direct government support for teacher training in the use of ICT, through the New Opportunities Fund (NOF), and for the purchase of 'National Curriculum approved' software, using e-learning credits through the National Grid for Learning (NGFL). Schools are audited on their use of ICT by Ofsted inspectors, though not on complementary and competing learning resources such as books. Table 7 indicates, however, that many of the former factors that limited the take up of ICT still apply. Over two-thirds of teachers believe that the lack of, and problems of access to, computer hardware is a problem. This stems in part from the decision by many schools, often prompted by LEA support services, to concentrate facilities in centralised computer laboratories. This tends to favour timetabled use for teaching ICT but militates against the casual use of computers within a subject context. Larger business studies departments, which have their own ICT suite, are in a better position to arrange casual ICT use. Networked interactive whiteboards tend to free teachers from this constraint. However, they can reinforce a teacher-centred focus within the classroom unless teachers work hard to develop strategies for active student engagement.

Two-thirds to three-quarters of teachers report a lack of suitable software due to budget constraints and the failure of the market to supply what teachers want to use. About a third of teachers believe that ICT is not cost effective and that it takes too much time to make obvious points. 29% of teachers apparently believe that books and print publications are still more useful than ICT and only 18% believe that ICT is more useful than print resources. Almost a half of teachers believe that their school or college is strongly committed to the use of ICT, with only a quarter finding a lack of school support.

Final Remarks

Since this survey was first conducted in 1985 there has been a substantial change in the quality of computer hardware and the nature of educational media. Computer hardware has moved forward from RM 480Z and BBC computers to the now ubiquitous PC Windows platform. Networking has moved from that of the single computer lab to the worldwide web of the internet.

In 1985 the main use of computers was for team games and simulations. These are now relatively unimportant. Through changes in hardware and software platforms and the disappearance of public funding for software development there has been a virtual disappearance of subject-based simulations, games and databases. Of the generic applications, word-processing has come to the fore and spreadsheets play a part. On the other hand, there has been an enormous growth in internet-based resources.

However, despite considerable development in hardware and ICT media, changes in overall computer use in the past 20 years have been relatively modest. Average levels of use within lessons have increased by only 3 hours per year, from 7 to 10 hours, in A-level Business Studies and Economics. The vocational business courses, which are free from the constraints of a final examination, have shown the greatest growth in use, from 10 hours to over 50 hours per year. A major change has been the expansion in the use of computers for private study outside the classroom and very often in the students' homes. There are signs that ICT is bedding itself into making a modest contribution to classroom practice alongside books, calculators, pens and rulers. Is it time that educational policy makers and inspectors stopped singling out ICT for special attention, ahead of other teaching approaches and resources and, most of all, books?

Members who would like to make observations on the material in this article are invited to e-mail the author at: s.j.hurd@open.ac.uk.