

A JCALT REPORT

**Joint Information
Systems Committee**

C&IT SKILLS
Developing staff C&IT
capability in Higher Education

**UEA
NORWICH**

Centre for Staff and Educational Development
University of East Anglia, Norwich

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Paddy Anstey
SCAITS project leader

Section 1 **Executive summary**

“While the effective adoption of C&IT in higher education requires appropriate technology, adequate resources and staff development, success depends on the effective management of change. The development and implementation of an integrated C&IT strategy will be one of the main challenges facing managers of higher education institutions.” (13:10)

“We recommend that all higher education institutions should develop managers who combine a deep understanding of Communications and Information Technology with senior management experience.” (Recommendation 42)

“We recommend that all higher education institutions in the UK should have in place overarching communications and information strategies by 1999/2000.” (Recommendation 41)

The above statements are taken from the report of the 1997 National Committee of Inquiry into Higher Education (the Dearing Report) and they provided a starting point for this project. They also represent something of a ‘catch 22’. The report identified the need for strategic planning. It identified the need for C&IT literate managers and outlined the challenges that face them. However, unless a Higher Education Institution (HEI) takes deliberate steps to grow its own C&IT capable workforce then it will be difficult to deploy technology to anything like its full potential. A C&IT skills development strategy which positions the institution and sets targets is essential to the planning process.

This report offers a map to help higher education institutions develop a workforce with strong C&IT skills. The map is based on the following, which have been identified as elements in an effective C&IT skills development strategy:

- A strategic framework for C&IT skills.
- C&IT skills for all – or only some – staff?
- C&IT infrastructure and desktop provision.
- Appropriate C&IT skills for staff.
- C&IT training and development.
- Help and support when using C&IT.
- C&IT qualifications and professional development.
- C&IT skills and recruitment.
- C&IT skills and promotion.

The report describes the relationships between these elements, and identifies actions that will embed C&IT skills within the fabric of an institution.

Since there is no single starting point and therefore no single route, readers are invited to produce their own route map by completing a strategic planning web – an exercise that has still greater value as part of a formal planning process, where the final version becomes the agreed outcome of a longer consultation process between different interests.

Section 2 Introduction

The structure of the report

The purpose of this report, which is based on the work of the **Staff Communications and Information Technology Skills project (SCAITS)**, is to help higher education institutions *embed* good communications and information technology (C&IT) practice throughout all areas of their work, in departments and central services. This process can only be successfully achieved if staff have appropriate C&IT skills and awareness.

The report is based on an in-depth investigation conducted in 1999 into a range of C&IT related issues at the University of East Anglia (UEA), Norwich. The results were informed by evidence from other HEIs, and compared with a private sector organisation and a public utility. This process identified a number of key elements which constitute the main sources of leverage that an HEI can use to influence the direction that its C&IT skills development might take.

This present section provides the foundation for what follows. It defines what embedding C&IT skills means, makes the case for giving importance to the process, and stresses the need for a strategic approach.

Section 3 introduces the idea of a strategic planning web incorporating the key elements of a C&IT skills strategy and describes a process by which readers can map the current position of their own HEI against their longer term strategic goals.

Section 4 describes the key elements of a C&IT skills strategy in detail. Readers are encouraged to think about practice in their own institution. Evidence from the SCAITS project is offered by way of illustration, and each section concludes with suggestions for further action.

Section 5 describes the in-depth investigations at UEA. Other HEIs may find it useful to replicate at least part of the work, by examining particular staff C&IT skills issues as they relate to their own situation.

The Annexes include (*inter alia*) a glossary of terms, and copies of SCAITS questionnaires. All the materials in this report are also provided as files on the disk supplied inside the back cover.

While every HEI has its own culture and context, discussion with staff from other institutions has shown that there is sufficient common ground between HEIs for all readers to benefit from the report.

What is meant by 'embedding C&IT skills'?

C&IT skills may be considered embedded when staff are aware how C&IT might help them to *conveniently* and *confidently* use C&IT to:

- correspond with others, and view corporate or departmental information;
- support appropriate job specific tasks that are regularly performed;

and where staff are aware how C&IT might help them to accomplish other tasks, including enhancing learning and teaching, and also know how to access support to maintain and develop their skills.

An institution may seek:

- institution-wide embedding where C&IT use is the norm for all (or nearly all) staff so that an institutional culture emerges where C&IT-based activities and developments are a natural part of the work experience;
- selective embedding where C&IT use is the norm for selected departments (vertical embedding) or across selected staff groups (horizontal embedding).

However, it must be remembered that although the C&IT skills reside in individuals, management attitudes and departmental or institutional structures and strategies may help or hinder the development of those skills.

Why embed C&IT skills?

C&IT has already made an impact on the work of HEIs. For a long time it has supported research, has been used extensively in administration and support, and more recently in mainstream learning and teaching. Much of that development has been on a piecemeal and ad hoc basis. The need to exploit systematically the benefits of C&IT led the Dearing report to place emphasis on the widespread, co-operative use of technology, across every sphere of activity. If C&IT is to become ubiquitous in HE then people need the skills to use it.

Benefits to staff

- Individual practice benefits by the use of software to support particular tasks. While many tasks are simply speeded up by the use of C&IT, others may be so complex that they simply could not be contemplated without the use of computers. Examples of the latter include research applications such as environmental modeling or calculations in theoretical physics, and HE management tasks such as organisational forecasting using complex analyses of institutional and national statistics.
- Inter-staff communications. E-mail is normally fast and inexpensive, and has already become the routine means of non-spoken communication amongst many staff. Desktop videoconferencing is set to grow substantially over the next few years.
- Institutional/departmental data dissemination. Use of an intranet is fast growing, not least because it gives access at any time to what should be a current, definitive copy of the information.
- Flexible approaches to learning and teaching can ameliorate the impact of increasing student numbers and create new possibilities for learning and teaching.

Benefits to the institution

- Many HEIs have already made a large investment in C&IT infrastructure, i.e. the network, hardware and software. HEIs need to maximise the return. A skilled workforce increases the chances of that happening.
- Good quality information, which is the key to good planning, can be gathered, analysed and utilised, using database systems, by managers with the necessary skills.
- Staff who are able to use C&IT to create flexible and distance learning courses can open up new markets for the institution.
- Well designed systems can speed up processes, increase competitiveness, liberate time and reduce frustration.
- Communicating quickly with all staff becomes a real possibility.

However the benefits will remain only potential benefits if systems designers, managers and users lack the knowledge, skills and confidence to take advantage of what C&IT can offer. Reading this report should enable individuals and higher education institutions to think about where they are now, to define where they want to be, and identify the action needed to get there.

Setting out on the journey: the strategic approach

This report emphasises strategic planning. In particular, it offers a map to help HEIs develop a workforce with strong C&IT skills. Route maps describe terrain to be traversed; they select appropriate roads. It is also helpful to consider the way the journey is undertaken.

The individual C&IT user can travel a long way on the technological equivalent of a bicycle; some might even be able to afford a Rolls Royce. However, if an institution is planning to move its whole workforce from Lands End to John O'Groats then the whole process needs to be managed much more deliberately. A 'bus might be a more appropriate vehicle.



Figure 1: Illustration of the key issues which are explored in the remainder of the report _____

Section 3

1. **Find your starting point.** Develop a C&IT skills survey for your own HEI. An example is given at Annex A. Use the position statements at the beginning of each of Sections 4.1 – 4.9 to clarify your current position. Map your position using the strategic planning web as described in Section 3.

Sections 3,4.1

2. **Agree a destination.** It may be provisional, it may be reviewed, but knowing where you are going is important in preserving resources both human and financial. Is there a common understanding of the institution's goals in relation to C&IT skills development? Is there a plan to get from A-B? Will the journey be on B roads or the motorway? State your goals on the strategic planning web – see Section 3, and see Section 4.1 *A strategic framework for C&IT skills*.

Section 4.1

3. **A competent driver.** Do senior managers recognise the pervasiveness of C&IT and is that recognition reflected in all aspects of strategic planning? For learning and teaching, human resources, and research? Do senior managers create and use 'joined up strategies'? See Section 4.1 *A strategic framework for C&IT skills*.

Section 4.2

4. **Who are the passengers?** Who is on board and who is being left behind? What impact will it have on the institution's ability to exploit the potential of C&IT in learning, teaching, research and administration? See Section 4.2 *C&IT skills for all staff?*

Section 4.3

5. **Size of the engine.** The extent and quality of the infrastructure and the provision of hardware and software will fundamentally enhance or constrain the development of a C&IT skilled workforce. See Section 4.3 *C&IT infrastructure and desktop provision*.

Sections 4.4,4.8,4.9

6. **Four wheels or three?** Good employment practice and procedures are crucial for an effective C&IT skilled workforce. It is hard to go anywhere unless C&IT skills are identified in job descriptions and person specifications. This involves identifying basic skills requirements for different categories of staff. Recruitment, appraisal and promotion procedures all offer the opportunity to emphasise the importance of C&IT skills. See Section 4.4 *Appropriate C&IT skills for staff*, Section 4.8 *C&IT skills and recruitment*, and Section 4.9 *C&IT skills and promotion*.

Sections 4.5,4.7

7. **Oiling the system.** Like the oil in an engine, training and development often gets overlooked. In the short term, neglect may not obviously be damaging but there are always long-term consequences. All staff should have the opportunity to develop and maintain their skills in appropriate ways and appropriate settings. See Section 4.5 *C&IT training and development* and Section 4.7 *C&IT qualifications and professional development*.

Section 4.6

8. **Membership of the AA (or equivalent).** User support of the right kind, at the right time and in the right place is going to become increasingly important as HEIs become C&IT based. How effective is your provision? New roles may develop. Can HEIs create more flexible career patterns? See Section 4.6 *Help and support when using C&IT*.

Section 4.1

9. **Fuel for the journey.** The choice of destination – the scope of an HEI's C&IT ambition – will be determined by available resources. An HEI that generates and implements a practical C&IT skills strategy can be confident of using its resources more efficiently and of creating a more capable C&IT skilled workforce. See Section 4.1 *A strategic framework for C&IT skills*.

Section 3 **To plan or not to plan – where are you now and where do you want to be?**

This project focussed on a single institution, the University of East Anglia, but its purpose is to provide a planning tool to enable other HEIs to refine and develop their own strategic goals in relation to C&IT skills and determine the action needed to achieve them. The framework we are offering is a **strategic planning web** which will help HEIs map their position in relation to the elements which the project has identified as being key to successfully embedding C&IT skills. Using the web makes it possible to recognise the overlap between learning and teaching, human resources and infrastructure and makes transparent the need for complementary and consistent goals. For example, there is no point in setting goals for the development of IT in teaching and learning which are inconsistent with the institutional spend on infrastructure, or where there is little support in terms of training and development.

How does the strategic planning web work?

There are three aspects to a C&IT skills strategy: technology, resources and staff development. These aspects can be further divided into nine key elements, each of which is discussed in detail in Section 4. It is not an exclusive list but they represent the main sources of institutional leverage which can be used to influence the direction that C&IT skills development will take in any HEI.

Key elements in a C&IT skills strategy

1. A strategic framework for C&IT skills

Many HEIs now have strategic plans for learning and teaching, infrastructure and information, human resources, and research. Their value depends on the extent to which they are integrated one with another, owned by the whole institution and are firmly linked to goals and resources. What stage has your HEI reached in terms of creating a strategic framework?

2. C&IT skills for all staff?

How extensive is the use of IT amongst all staff categories. Is *all_staff@site.ac.uk* a goal for your institution?

3. C&IT infrastructure and desktop provision

What is provided? Is it adequate? Does it anticipate future developments?

4. Appropriate C&IT skills for staff

Does your HEI have a policy on the skills levels appropriate to particular roles?

5. C&IT training and development

What does your HEI offer? Does it meet the needs of all staff groups?

6. Help and support when using C&IT

How accessible is help and support? Is it of the right kind, in the right place and at the right time?

7. Accreditation for C&IT skills

Are you using accreditation as a way of helping to embed C&IT skills in the workforce? For whom might such an approach be appropriate?

8. C&IT skills and recruitment

How important is it to recruit staff with appropriate C&IT skills? Are skills identified? How are they tested?

9. C&IT skills and promotion

Does the possession and application of C&IT skills have significance in the process? For all, or only some categories of staff?

The answers which different HEIs give to the above questions will vary enormously depending on resources and priorities. There can be no single institutional blueprint for a C&IT skills strategy. Nonetheless all HEIs need to have thought about how C&IT is going to underpin the overall strategic framework and what follows from that in terms of embedding C&IT skills. Senior managers need to outline strategic goals. They need to check that their goals are consistent one with another. They need to ensure that there is institution-wide ownership of their plans. Nobody starts with a blank sheet of paper – so they need to know what their starting point is, how far there is to go, and what to do to turn theoretical goals into practical reality.

Using the strategic planning web

The strategic planning web is an adaptation of the competitive web and spider web. Figure 2 is a worked example of the web in action. Each of the nine arms of the web represents one of the above key elements. It can be thought of as a continuum from 0 in the centre to 10 at the outer rim. 0 means zero progress, 10 means the goal has been achieved. In each box is an agreed goal in relation to each key element. The point marked on each of the arms represents a judgement as to how far the institution has progressed towards achieving the goal. Joining the points creates the web.

What can the web demonstrate?

The web is essentially a diagnostic tool. It does not claim to be a refined scientific instrument. What is important is the process of thinking through not only goals in relation to the key elements, but also about what constitutes evidence of progress. The next step is to judge the extent to which goals have been achieved and, most importantly, what still needs to be done. Taking Figure 2 as an example what it suggests is:

- an imbalance between progress in the areas of HR practice, infrastructure and training
- that some goals will be difficult to achieve without the basic building blocks of job descriptions and person specifications
- that many staff have yet to get a foot on the C&IT skills ladder – this reduces the value of the intranet and limits the use of technology in institution-wide communication
- that the infrastructure is able to support the demands of teaching and research.

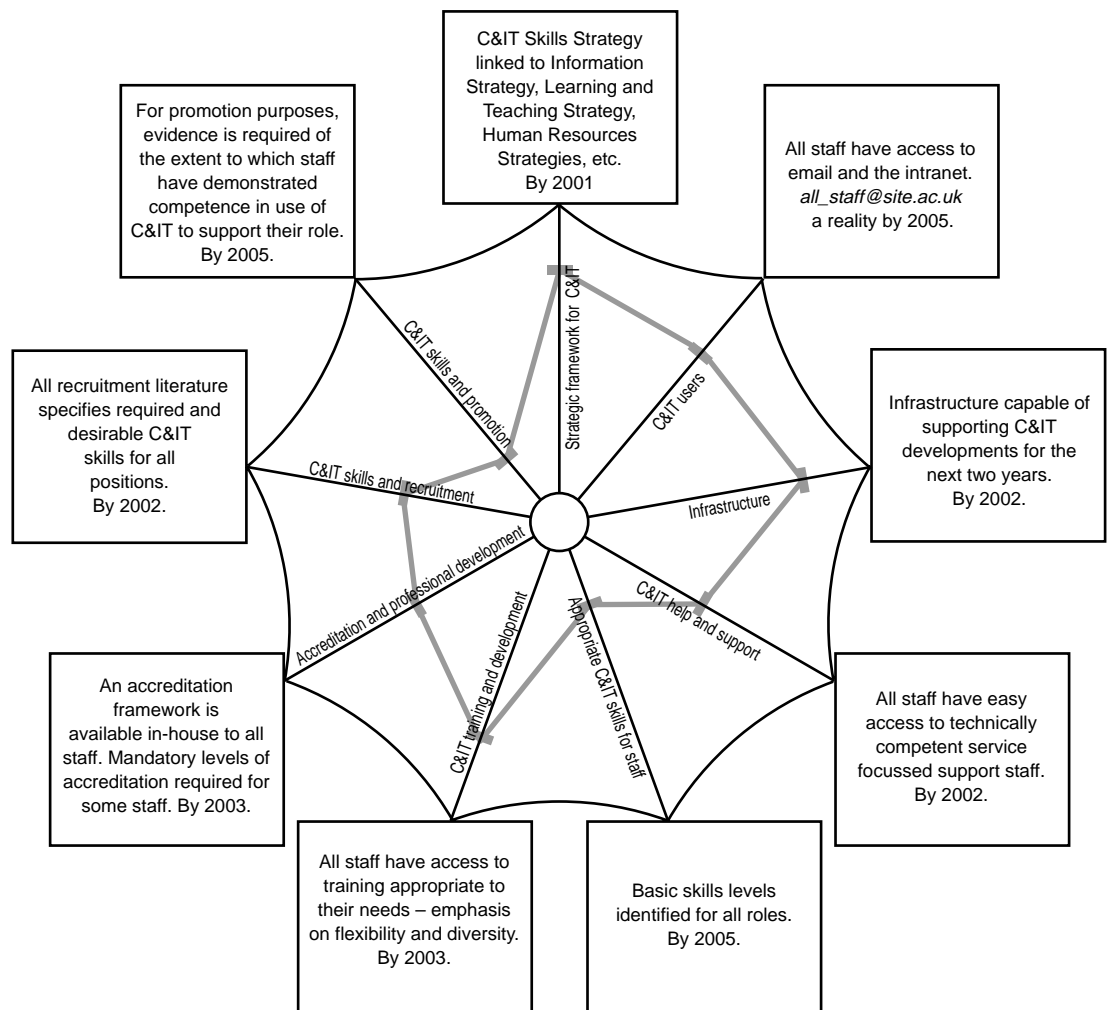


Figure 2: An example of a strategic planning web

The next step will be to revisit the goals and either redefine them to reflect more realistic aspirations and/or to think about what needs to be done to make progress along each continuum. There may be some actions, such as the decision to undertake an institution-wide survey of C&IT skills, which will provide the basis for action in a number of areas. Some actions will have a wide impact, others need to occur in parallel and do not form a simple sequence.

In an ideal world the web drawn by a member of academic staff in the department of biological sciences will look similar to that created by the Pro-Vice-Chancellor for Academic Infrastructure. If, in practice, they diverge significantly then that is an issue to be addressed as part of the process of creating a C&IT skills strategy. For example, if the goals suggested by departments demand a high degree of autonomy in relation to the purchase of hardware and software, high levels of support and a next generation infrastructure, then in the presence of resource constraints this may not be consistent with an institutional goal of raising the levels of basic C&IT skills for all staff.

Creating a strategic planning web for your institution

If you wish to try drawing your own web follow the steps below. A blank proforma web is provided as an insert inside the back cover of this report.

1. Read through Section 4, which is divided into nine parts, each focussing on a key element. At the beginning of each part there are statements which will help you position your HEI and help you make a judgement as to where you are in relation to your goal. At the end of each part there are suggestions for action.
2. On the proforma, outline your provisional goals in the blank boxes.
3. Make your judgement based on the notional scale of 0-10 as to where your HEI is in terms of achieving each goal, and mark each arm accordingly.
4. Join up the points to create a web.
5. Think about what the whole picture says concerning staff C&IT skills in your HEI. Do the goals complement one another? Is there one element that is having a disproportionate impact on the others?
6. Identify future action and/or revisit your goals.

This mapping exercise can be done individually but it has much more value if it is used as part of a planning process. The final version then becomes the agreed outcome of a longer consultation process between different interests.

Section 4 **Key elements in a C&IT skills strategy**

4.1 **A strategic framework for C&IT skills**

Where are you now?

- Does your HEI have an information strategy linked to targets and resources?
- Does your HEI have a human resources strategy?
- Does your HEI have a strategy for learning and teaching?
- Does your HEI have a research strategy?
- Does your HEI have a C&IT skills strategy supported by a C&IT skills development policy?
- What is the linkage between the different strategic strands?
- Does a member of the senior management team have responsibility for infrastructure and C&IT skills development?
- Do departments have their own strategies for developing C&IT in learning and teaching?
- Is there evidence of collaboration between key support services and decision making bodies? (computing, audio-visual services, staff development, personnel, learning and teaching committee, information strategy steering committee, human resources policy committee, etc)?
- What are your funding arrangements and how do they influence strategic planning?
- How is your HEI organised? What impact does the decision-making structure have on the development of strategy?
- Is C&IT skills development a managed or an ad hoc process?

Discussion

The need for a strategic approach

Strategy and resources go hand in hand. Staff normally account for about two thirds of expenditure. Expenditure on IT related hardware, software and infrastructure now represents a significant element of non-staff costs. HEIs need skilled workforces who are properly equipped, appropriately managed, supported and trained. In this context planning needs to be an explicit and well-managed process which recognises the links between teaching, research, information, communication and people. Implementing appropriately funded C&IT strategies and incorporating C&IT skills into other relevant strategies will result in a more effective institution where C&IT makes its full contribution to research, learning and teaching, and to all supporting roles in HE. HEIs may differ in their aspirations but they all need to set goals and describe how those goals will be achieved.

In HE computers from their earliest days have been used in support of research and it is hard to see any present research progressing effectively without use of the Internet. C&IT is also well established in administrative tasks, and more recently has become important in learning and teaching, and in management. Institutionally, e-mail and the intranet are becoming key mechanisms for communication and information provision.

C&IT is a basic tool for HE staff. The proper use of C&IT in any organisation can bring benefits of efficiency and effectiveness, and a strategic approach to C&IT skills development helps maximise those benefits by:

- ensuring basic C&IT skills across all staff computer users
- ensuring basic C&IT skills as a sound foundation for specialist C&IT skills in support of research
- ensuring essential C&IT skills in support of learning and teaching
- supporting hardware and software policies
- cross-fertilising good C&IT practice.

Currently at UEA C&IT skills development has been largely unregulated. C&IT training is readily available and in most cases staff can choose whether or not to attend, on a voluntary basis. Departments have considerable autonomy in their choice of software and hardware although not all their choices will be technically supported. Many managers and staff, particularly those in support roles, would welcome a strategy which regulated choice to a greater degree.

“The biggest single problem is lack of a clear [institutional staff C&IT skills] strategy.”

“There appears to be no explicit staff development or corporate development strategy driving the [C&IT] training provision.”

“We need a co-ordinated policy for all categories of staff, driven by the University, rather than department-based, setting basic skill levels for each category of staff, supported by mandatory training sessions.”

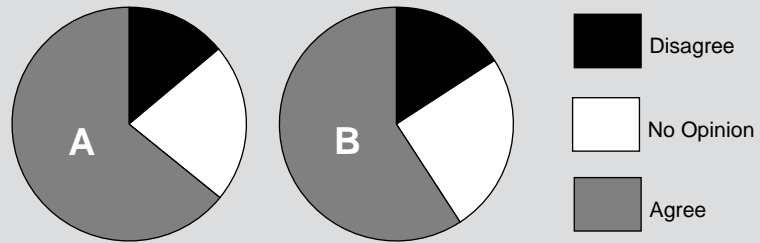
“We need enforced training courses! Too many people use computers with too little knowledge.”

However convincing, the case for a strategic framework will not have universal support. The SCAITS project has revealed that for many staff at UEA strategic planning is synonymous with corporate control.

“I provide my computer from research funds. It has nothing to do with the University what I have or what I do with it.”

Given the role and functions of HEIs it is always going to be difficult to reach a consensus on the balance between regulation and autonomy. For example, mandatory C&IT skills training for all staff could have a dramatic impact in helping to embed institution wide C&IT skills; so would mandatory awareness seminars for all managers. Conversely, over-regulation in terms of hardware or software might damage research potential. Degrees of standardisation can be another thorny issue.

At UEA, where use of PCs with MS-Office is very strongly encouraged, the staff survey revealed the following opinions on standardisation issues.



A There should be standard provision of *software* at UEA
 B There should be standard provision of *hardware* at UEA

Figure 3: Opinions on standardisation issues

Most support staff generally agreed with the statements, while roughly one third of academic staff and those from academic units disagreed, as did a similar proportion of Mac users.

Where the potential exists for substantial differences of perception, any C&IT skills strategy must be built on good quality information. An institutional strategy is likely to be more broadly accepted if it is derived from well researched facts, with the involvement of those concerned.

Benefits from a managed approach to C&IT skills

The availability of any C&IT solution is only a *potential* benefit. The benefit can only be realised by those who are suitably trained and skilled. Cost benefits arise from greater staff efficiency/productivity and fewer calls on others for help and support. Greater productivity can lie in direct personal productivity and also through the effective exchange and sharing of information. Being less reliant on others means fewer calls on formal support mechanisms and fewer interruptions to colleagues for informal assistance. For example, a small college in the north of England is planning to introduce basic C&IT accreditation, using the European Computer Driving Licence, across *all staff* (including senior managers) so that everyone will have basic C&IT skills to at least the given standard. Consultants estimated a consequent saving of 0.5 calls to the help desk per person per week, and an increased productivity of 5 minutes per person per day. That yielded a saving of £306 per person per annum, to be set against the previous regular spend of £170 per person per annum on C&IT training, giving a net cost benefit of £206 per person per annum.

Similarly, future spend on C&IT training might be reduced by placing much greater emphasis on recruiting staff who already have the skills necessary to do the job to which they are being appointed. This could allow funds to be redirected from basic to more advanced training.

Many HEIs have already made large investment in C&IT infrastructure – the network, hardware and software. The challenge is to make best use of that investment, and maximise the return on it. Enabling staff to make good use of C&IT, by equipping them

with the necessary skills, is key to achieving that potential. But context is all and any institutional strategy for C&IT skills will be influenced by two factors: control over resources and decision-making.

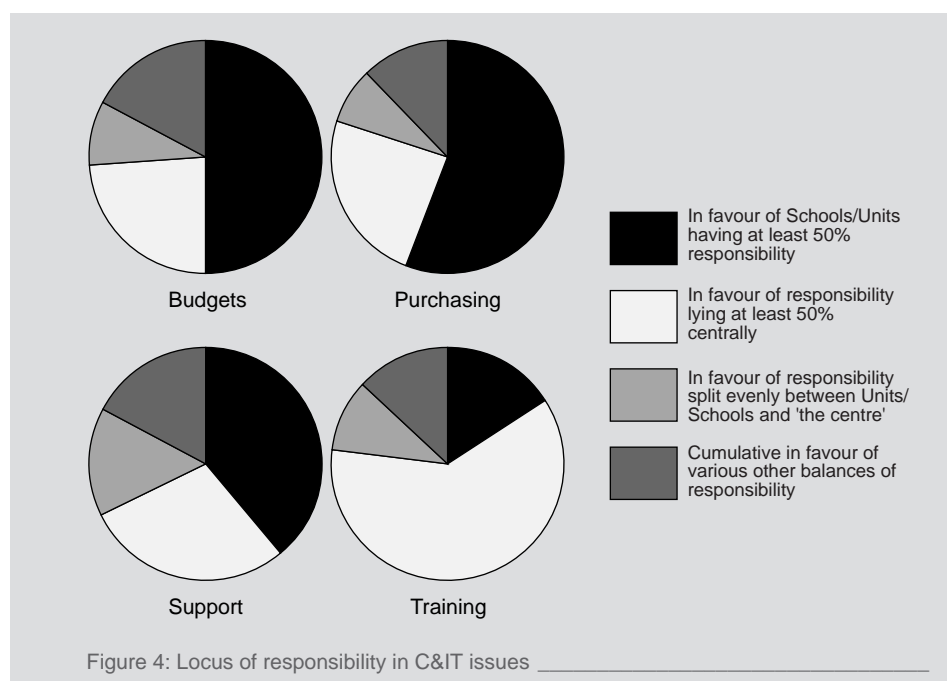
The impact of funding patterns on strategic planning

Where major costs are involved, the balance of spend between ‘the centre’ and departments may pose problems when attempting to institute organisational change. Indeed, particularly where institutions are highly devolved, with departmental cost centres, institutional policies and strategies derived from strategic institutional management will generally need to be championed by senior managers who will work hard to ‘sell’ the advantages to the various sections of the organisation. Even if the departments are not required to pay from their own budgets, they pay indirectly via a ‘top slice’.

Decision-making – departmental and central responsibilities

The locus of responsibility in C&IT issues needs to be clearly defined. For example, it may be that C&IT in support of research and teaching is a departmental responsibility, while C&IT for administration, together with all network and related infrastructure, is a central responsibility. However, there may also be institution-wide decisions to be made concerning the choice of hardware and software standards.

A C&IT skills strategy may, in principle, place the balance of responsibility for C&IT skills training and support anywhere along the ‘department-centre’ continuum. It does not need to be co-located with responsibility for, say, C&IT support. Figure 4 shows that UEA respondents to the UEA survey were largely in favour of central responsibility for C&IT training, with the implications for ‘top slicing’, while it was generally felt that responsibility for other C&IT related matters should be devolved:



A strategy for C&IT skills

A strategy for C&IT skills will sit alongside and be complementary to the institution's other strategic plans. To be workable it will need to:

- set out the goals to be achieved
- describe the action needed to achieve each goal
- set down timescales
- provide details of funding
- identify the individuals or groups with responsibility for action.

For example, if an HEI were to outline a goal which committed the institution to ensuring that all staff have basic levels of C&IT skills appropriate to their roles by 2005, the strategy for C&IT skills would then have to describe the action necessary to achieve that goal. This could include the following:

- defining basic C&IT skills. These will be different for different staff categories. A minimum might be the ability to send and receive e-mail messages and to find information on the intranet
- setting up mandatory training for all staff to ensure that basic skills levels are achieved
- introducing the European Computer Driving Licence (ECDL) as a way of establishing skills levels and monitoring performance
- ensuring that all staff have access to a networked PC
- arranging appropriate training for all staff categories
- outlining of responsibilities for delivering the goal
- identifying funding arrangements.

Towards a C&IT skills framework – some suggestions for getting started

- Look at the status quo in your own HEI in terms of any implicit or explicit strategies. What do they tell you about the extent of the institution's thinking about C&IT skills?
- Use the strategic planning web (see Section 3) as way of identifying goals and exploring issues.

4.2 C&IT skills for all staff?

Where are you now?

- Considerable variation between departments in terms of C&IT use by staff.
- Considerable variation between categories of staff in terms of C&IT use.
- All staff who wish to can become C&IT users.
- All staff are automatically given an e-mail address.
- All staff have access to appropriate C&IT skills training.
- Pockets of non-users in all categories of staff.
- Take up of training courses is greatest amongst administrative, secretarial and clerical staff.

Discussion

C&IT skills for all?

The majority of staff in HE use computers in their work. In the UEA staff survey, 86% of respondents were computer users. Computers are used for particular task-related activities, e.g. to generate letters, reports, course materials, to maintain lists, and to perform analyses in support of research. Over and above these particular applications, electronic mail is very widely used for non-spoken communication between staff and the intranet is steadily replacing paper for making institutional or departmental information available.

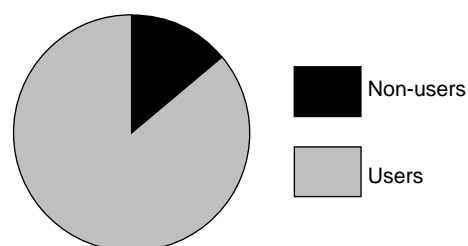


Figure 5: Staff using C&IT within their job at UEA

Given the now almost routine assumption by many that one might in principle send a message to *all_staff@site.ac.uk* and also the importance of access to computer based information of all kinds, those who are not computer users (represented by the 14% of respondents in the UEA survey) may be considered as disenfranchised.

Typically, manual staff fall into this category of non-use. There are exceptions. Similarly, it should not be assumed that all staff in an apparently C&IT literate group have these skills. There may be exceptions, most likely among part-time staff.

Not all non-users are eager to use computers. This may be through lack of interest, or through fear of the unknown – or of technology in particular. It is with good reason that a number of HEIs have run 'Computing for the Terrified' or equivalent courses over the years. Such courses can serve to demythologise the topic, and in particular help participants to overcome the barrier of C&IT jargon. Jargon is rarely used actively to exclude others from C&IT use, but the sheer quantity of jargon associated with computing most certainly deters many of those wishing to start, and may give feelings of exclusion where others 'speak the language'.

However, at UEA some non-users simply feel left out in a more general way:

“I feel out of touch and a bit of a dinosaur.”

“It is the way ahead. We should be encouraged to use them so they become an everyday part of our equipment.”

Others can see particular reasons to use computers:

“I think it would help to log data, and easier to get in touch with people by e-mail.”

“At present all the information is kept in books. It would be easier to update information if kept on computers.”

“I have to wait for a clerk to give me the information from the finance system.”

However, line managers may not feel that the use of computers is important for certain sections of staff:

“They haven’t needed computers in the past for their jobs. What’s different now?”

This attitude is fairly common amongst the managers of manual staff groups in HEI, and led one UEA respondent to comment:

“I feel disadvantaged because we are not given time off to attend courses ... there are unequal opportunities [across the University].”

The issues in such statements are much broader than C&IT, and relate to the notion of whether or not the institution is (or should be) a ‘learning organisation’ for all staff. Should staff development be seen as entirely instrumental, focussing only on job-related skills development or is it a holistic process, as much about motivation, creating a sense of common purpose and community, as skills development? Each institution will have to find the right balance.

Some managers of non-users are supportive of staff development in its broadest sense, and problems sometimes can lie in the availability of suitable courses at appropriate times. For example, cleaning staff typically complete their work by mid-morning and some have other jobs to go to, so that they cannot attend in their own time even if they wanted to. It may be that for some staff, innovative approaches need to be introduced, such as one-to-one work place coaching, and flexible self-instructional materials. See section 4.5, ‘C&IT training and development’.

Other non-users may lack confidence when it comes to learning new skills. It may be a long time since they were in anything like a classroom situation. For such, the use of ‘employee development schemes’ could help set their foot on the learning ladder. Under such schemes, finance is available to staff (usually to a maximum of £100) to help them attend a course of their own choice, in their own time, in order to fulfil some ambition. For an employee at one university, this was learning to swim. The argument for this approach is that having had a positive learning experience the member of staff will then be far more open to other learning experiences, e.g. learning C&IT skills.

Not all HEIs will see non-users as a priority.

“Given the limited resources at my disposal, I would not feel inclined to give priority to providing training for present non-users from among our manual staff. Anyway their preferred approach to getting information is via team briefings [rather than from computers].”

While C&IT inclusivity is important, the above comment reminds us that although C&IT has its advantages, it is not a substitute for regular face-to-face communication.

The cost of inclusivity

There are costs associated with turning non-users into computer users. Training costs, hardware, software and networking costs all need to be met. Simply cascading the oldest computers and their software to these staff *‘because they don’t need to do much with them’* is to be resisted. To take that line may give them computer systems with operating systems and software out of step with those used by the majority, which may in turn give rise to both training and support problems. Furthermore, given the staff groups likely to be most affected, the provision of out-of-date computer systems would for some serve to confirm existing feelings about being ‘bottom of the heap’ and not valued by the institution. These new users need access to appropriate elements of the current standard software used by the institution.

This could be via a new (if not high specification) computer, although there are ways of reducing the cost of this additional provision. It may be possible to upgrade old hardware to a suitable specification, or alternatively old computers might be used as ‘thin’ clients (see, for example, the report on JTAP project 436, concerning the ‘Reuse of Legacy Computers’), so that up-to-date software can be accessed.

Such steps towards a more fully C&IT-enfranchised workforce may be seen as desirable. However, given the various barriers to change, it is unlikely that full embedding of appropriate C&IT skills across all (or even most) staff groups will take place in the absence of a range of complementary actions.

Evidence from non-users at UEA

In a ‘C&IT skills and use’ survey of all UEA staff, those who do not currently use computers in their work were presented with a short section of questions designed to discover:

- (i) levels of computing/IT knowledge
- (ii) whether they felt disadvantaged in not using computers
- (iii) whether there was interest in developing any/further IT skills.

The responses indicated that several of this ‘non-user’ group did have some computer skills, and a small number felt positively disadvantaged by not having any. There was clear interest among many in the group, in developing some IT skills.

14% of all respondents did not use computers in their work. These were mainly from the manual/general (69%) and the technical/maintenance grades (20%), working in the Residences or Estates groups. Two thirds

were part time staff, 42% were over 50 and 73% were female. The response rate from the manual/general grades was 26% which was much lower than other groups, but it is not unexpected given that most of the staff who do not use computers are from this group. Because of this rather low response rate and the consequent small number of respondents completing this part of the questionnaire, the usual 'low numbers health warning' should be noted.

Approaching one third of these 'non-users' had experience of using a computer. Of this group word processing was the most common skill with fairly equal numbers having some experience with using e-mail, surfing the Web and data entry.

Summary of responses from those who are not currently using a computer in their work [N=119]

	Yes	No
Do you have any experience of using a computer?	31%	69%
Do you use a computer at home?	19%	81%
Have you attended any computer/IT training courses at UEA?	13%	87%
If no, would you like to?	39%	61%
Do you think you are disadvantaged in your work at UEA by not using a computer?	13%	87%
Would you like to develop computing/IT skills?	45%	55%
If you had access to a computer in your workplace would you use it to develop skills that might help you in the future?	44%	56%

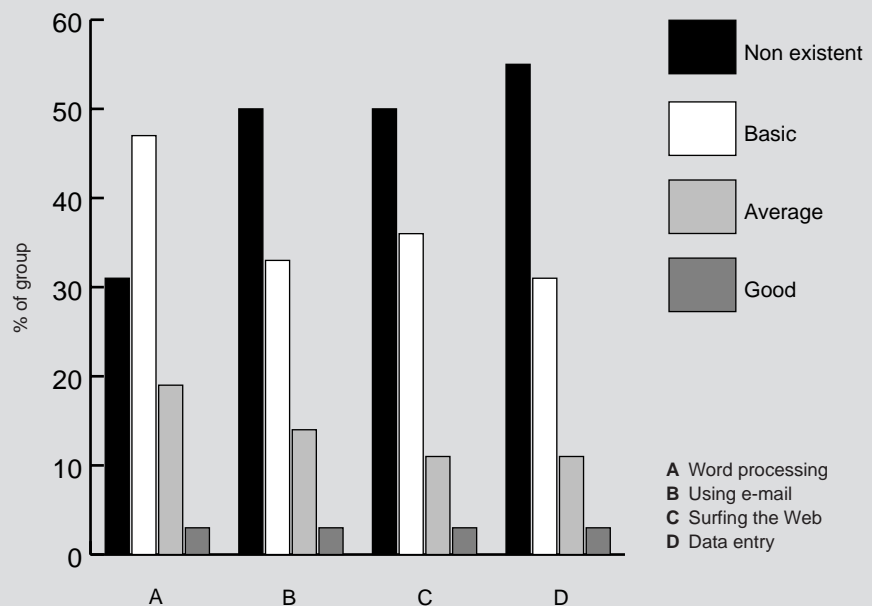


Figure 6: IT skills of those who have had some experience of using a computer but do not currently use a computer in their work [N=36]

A small percentage (13%) of our present 'non-users' had attended IT training courses at UEA, but there was clearly some interest (39%) in doing so. Respondents were asked if there were any factors that made it difficult for them to do that. They fall into three main categories: because of other commitments it is only possible to attend during working hours; it is difficult to get cover for work to attend a course; difficulties in accessing courses because, for example, of working shifts.

On the subject of feeling disadvantaged in work because of not using a computer, only 13% overall felt this. However, this rose to 41% of the small group from technical/maintenance grades. The reasons given fell mainly into two categories: (i) the respondents could see a use for it in their present job, and (ii) it made them feel left out and lacking in skills.

Almost half (45%) of the 'non-users' would like to develop IT skills and the popularity of different areas follows:

Skills respondents would like to learn [N=119]

	<i>Skill percentage</i>
Basic introduction to using a computer	29%
Keyboard skills	22%
Word processing	19%
Using e-mail	19%
Surfing the Web	18%
Other: databases	2%
Everything	1%

The idea of access to a computer in the workplace in order to learn skills was well received with 44% indicating that they would use one if provided.

What might be done?

- A survey of all staff will reveal the extent of C&IT usage. At present it is likely that some groups of staff may not be computer users, and that there will also be isolated instances of non-use amongst most other staff groups.
- Begin to frame some goals focussing on the extent of usage of C&IT by staff.
- Link staff C&IT skills to other strategic plans for teaching and learning, human resources, research, information.
- Sell the value of an IT literate workforce to managers and supervisors and help them to identify the direct and indirect benefits.
- Provide a variety of appropriate training opportunities for those needing to develop their C&IT skills.
- Ensure easy access for all staff to a networked, up-to-date, workstation at or near their usual place of work, or at their base where the work is not primarily at a fixed location.
- Focus on immediate needs and the resolution of problems (e-mail and the intranet).
- Try setting up a pilot employee development scheme.

4.3 C&IT infrastructure and desktop provision

Where are you now?

- Many staff have convenient access to desktop computers, but sharing is not uncommon. A significant minority of staff use desktop computers that run operating systems that are old and no longer actively supported within the institution. Networks and servers just about cope with normal loads but struggle at times of peak demand. Breaks in network based services of at least a half day duration happen several times a year.
- Most staff have convenient desktop computer access, and sharing is rare. Most run institutionally supported operating systems. Networks and servers cope with demand in all except the most unusual of circumstances. Breaks in network based services happen several times a year but normally last no longer than two hours.
- All staff have convenient desktop computer access, and sharing is extremely rare. With the occasional exception for demonstrably good reason, all computers run institutionally supported operating systems. Networks and servers cope with the load in all present circumstances, and breaks in networked based services are rare, with back up systems and network configurations enabling most breaks to be of no more than 15 minutes.

Discussion

Infrastructure as the cornerstone of a C&IT skills strategy

The quality of the C&IT infrastructure and desktop provision is a key element in an effective C&IT skills strategy. However good the training and user support available in the institution, the overall strategy can only work in the context of the C&IT infrastructure provided. If the infrastructure is inadequate, it will necessarily inhibit the embedding of C&IT in the institution.

This section of the report looks first at computer hardware and software provision, including institutional standards, followed by issues of sharing, use of computers at home, and finally the quality of the network and its services.

Provision

Staff without convenient access to a computer, in their normal workplace, are unlikely to use C&IT on a regular basis. If C&IT skills are to become embedded, suitable provision of networked computers must be made and each must have the software necessary to facilitate the work of the staff using it. Convenience of access is important. For example, all staff at UEA have access (in principle) to computers and to Internet facilities and if they do not have immediate access via their work place, staff can use 'open access' PCs provided for the students. In practice, the majority of those without access in their office or place of work rarely avail themselves of the computing facilities.

To standardise or not to standardise?

Whatever the relative merits of particular hardware and software, standardisation brings substantial benefits in terms of ease of information transfer, and avoids the cost of duplicated effort in both training and support. It also offers potential benefits in bulk hardware purchase and the wider applicability of site licences for software.

Some HEIs place an emphasis not so much on the actual hardware and software used by individuals, as on stated standards for information interchange (for example, rich text format for word processed documents). The experience at UEA (predominantly PC based, but with Macintoshes favoured by some groups) is that such an approach, while sound in theory, still gives rise to significant problems in practice.

Evidence from UEA

The use of PCs running recommended software is moderately widespread (just 14% of respondents to the staff survey were Mac users). However, whether conforming to the institutional recommendation or not, hardware and software (including upgrade) purchases are often made 'as required' and requirements frequently specified by the user.

There are considerable differences between responses from those in different departments, but sometimes software needs are not met; sometimes there is dissatisfaction with the hardware. Indeed, staff rated a new or upgraded computer as second in priority (after 'more/better targeted courses') when asked what two things would help them to use their computers more effectively.

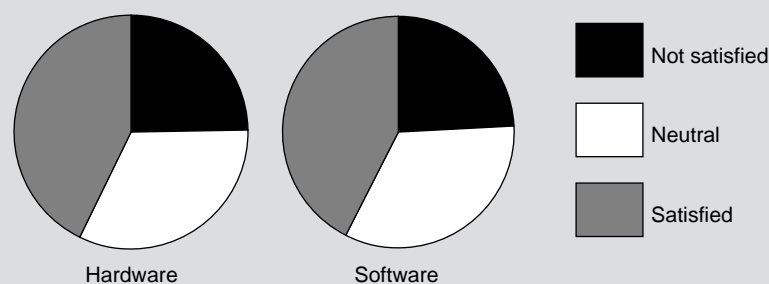


Figure 7: Concerning satisfaction with their provision

Software needs that are not currently met [N=154]

Software	Approximate number of mentions
Graphics and image conversion packages	20
Specialist statistics packages	18
Access or other databases	15
Upgrade to Windows 95/98 or NT	13
Web software	12
Upgraded version of word processing package	11
Scheduler/diary/project manager	10
Editing	10

Funding and standardisation

At UEA, computer hardware and software for staff are generally paid for in one of two ways. Those with research budgets can purchase whatever they deem appropriate. This may reflect their own preferences of hardware and software, or (quite appropriately) that most frequently used nationally or internationally in their particular research area. In this case institutional standards will be ignored. Staff attitudes can be strong:

“I provide my computer from research funds. It has nothing to do with the University what I have or what I do with it.”

Individuals may have problems with support if they make certain choices, but there is also a serious cumulative effect. Multiplied across research projects, a single large department can end up with a wide variety of hardware and software in regular use, not only for the specialised research tasks but also for ‘routine’ C&IT tasks such as word processing and e-mail. As remarked by a senior member of one department:

“The variety can be useful for innovation, but what you lose out on is integration.”

Departmentally and institutionally, such diversity either increases the cost of C&IT skills training and support, or those who do not conform to the local standards are left to look after themselves.

Departmental budgets are the main source of finance for staff hardware and software. Of course, there may be good reason in some cases for rejecting particular requests, while in others the available budget might require a phased meeting of the institution’s standards and expectations. That appears to be in part the case in the UEA example, above, of unmet software needs. MS-Office 97 on NT4 is the current UEA standard, and some staff feel left behind. Some of the other unmet needs (graphics/image conversion and Web software) may be associated with the institutional push to provide information on the intranet.

Compatibility and quality of hardware

Other hardware/software provision issues identified in the UEA staff survey are:

- compatibility of the University provided system with the staff member’s own computer at home;
- having to use old systems (386 and 486 PCs running Windows 3.1), sometimes assembled from still-functional parts of otherwise broken systems.

The last point reflects the difficult financial situation that holds throughout the sector, where departments are forced to keep equipment running as long as possible. Indeed, computers from research grants (with possible compatibility problems, as identified above) are used to extend their equipment pool. It is not unusual to find five and six year old computers still in use, not upgraded, by which time they are unlikely to offer their user compatibility with the current standards. This results in greater difficulty for file exchange and general support, and generally renders the current training provision inappropriate if new tasks are to be undertaken.

Sharing hardware

While many staff at UEA are each provided with a desktop computer, some staff share. This can evidently work satisfactorily where part time staff have full access during their particular employment period, and then hand over to someone else. Even then, there are concerns over confidentiality of information where sharing takes place in that way.

General sharing of a system can give access problems:

“Having to wait to use the PC means my work takes twice as long to complete.”

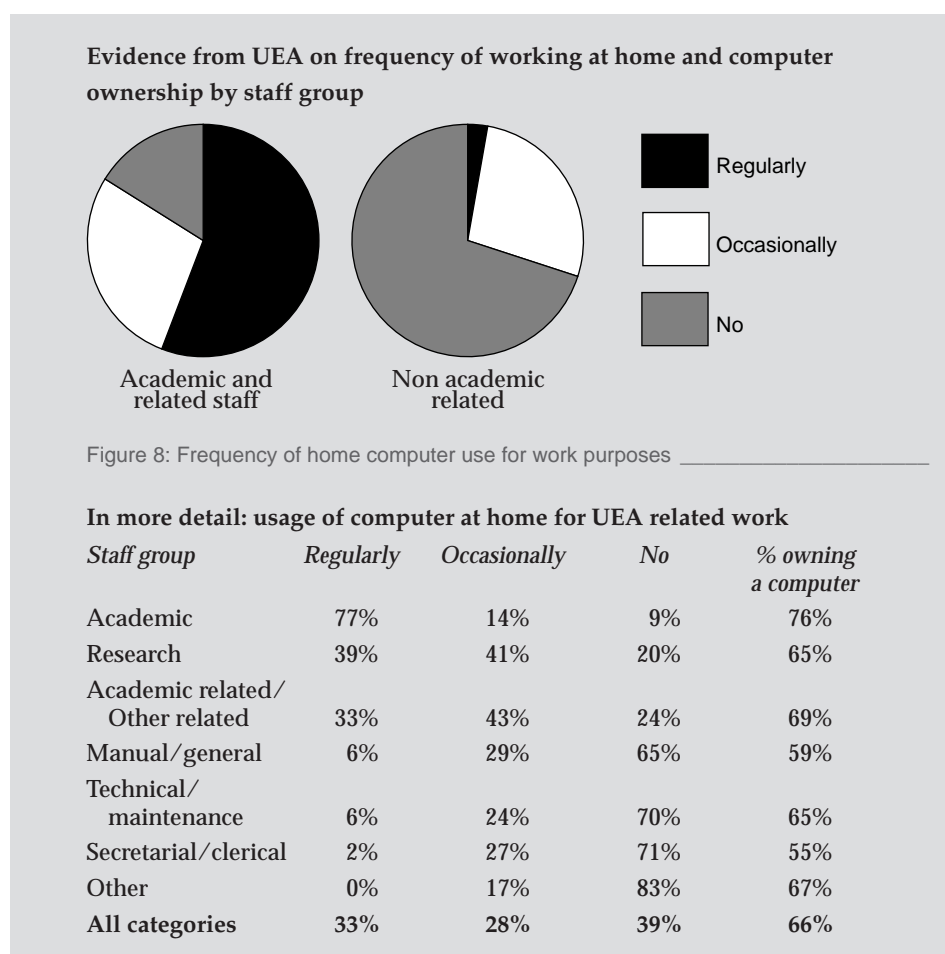
In other cases, staff may have full access to their own computer but also share access to a laptop. This too can be problematic with the growth in use of presentation graphics for teaching:

“There is currently a shortage of laptops for teaching. As a result, my personally owned laptop is being used by my colleagues for teaching.”

“I usually solve the problem by borrowing my wife’s!”

Use of a home computer

The use of personally owned equipment for work purposes extends to use at home.



This not only confirms aspects of Bacsich’s report for JCALT on *The Costs of Networked Learning*, concerning use of home equipment for university purposes by academics, but also shows substantial commitment amongst other staff grades.

Of the 454 survey respondents who use a computer at home for UEA related work, almost half have an Internet connection from home and almost two thirds of these have used dial-up to UEA. However, one member of staff commented:

“I do not wish to bear all the cost of Internet access for UEA work out of my personal taxed income.”

All UEA staff have routine dial-up available via the computing service. However, one department at UEA also has a server that allows reverse charging for dial-up by its own staff. This is exceptional. However the question of who pays when staff are working at home will have to be addressed as flexible working becomes increasingly the norm.

Quality of the network and its services

There are technical issues concerning the quality of the network and network services. Users need and expect reliable and fast services. The expectation of availability of services is akin to that of telephone services ... in effect, 'always available'. Indeed, for some institutions, breaks in computer network services may be very serious indeed, especially where there is a major emphasis on C&IT based teaching and learning. In respect of speed, slow networks or servers will at best be frustrating. Where 'real time' is important, e.g. for on-line demonstrations in lectures, or desktop video conferencing in support of distance learning, slow responses may even render the activity impossible. For dial-up, sufficient lines must be available.

In any HEI aspiring to be an e-organisation, network suppliers and network service providers must recognise their crucial roles. Inadequate networks or network segments, or poor network services, will not only hamper the functioning of the organisation, but dampen the enthusiasm with which staff embrace the associated C&IT skills.

What might be done?

- Ensure that all staff have convenient access to an adequately powerful networked computer, having (at least) standard software used in the institution.
- Introduce a policy of regular computer replacement or upgrading to maintain currency of systems in terms of hardware expectations and software to institutional standards.
- Assure the quality of the network service provided by:
 - (a) monitoring network loading to eliminate bottlenecks and anticipate growth of usage that may require upgrades
 - (b) building easy reconfiguration into networks to rapidly overcome a break in any particular link
 - (c) ensuring duplication of servers and/or associated disks, so that network based services can continue with minimal break at times of equipment failure.
- Calculate the costs and benefits in terms of time, money and efficiency of standardisation (in the different areas of the institution's activity) as against those of non-standardisation.

4.4 Appropriate C&IT skills for staff

Where are you now?

- There is no agreed set of C&IT skills for any role in the institution.
- Some departments have identified C&IT skills requirements for at least some roles.
- A *basic* C&IT skills requirement for all staff in the institution has been identified.
- Besides the basic skills requirement, additional C&IT skills have been identified for many roles.
- All roles have an associated C&IT skills profile.

Discussion

What are the core skills?

At the very basic level, it can be argued that the ability to read information from an intranet and to send and receive e-mail constitute the minimum skills set appropriate to *all* staff in an HEI aspiring to an e-culture. It can, however, also be argued that all staff should have a broader skills set so that the C&IT provision offers a richer rather than minimalist environment. For example, all staff should be able, with confidence, to handle files, navigate directories/folders, and use a word processor – in addition to competence with very basic e-mail and the intranet.

Minimalism cannot be recommended. Staff should have enough skills to enable them to do those things they regularly *need* to do confidently and effectively, with enough knowledge to be able to explore the system further if required. It should also allow them to have a reasonable attempt at backing out of the inevitable minor problems everyone meets when using computers, perhaps following an unintended keystroke combination. Without a broader understanding, calls for assistance will be more frequent.

We would argue that the core C&IT skills currently needed by 'everybody' are in the basic use of:

- an e-mail package;
- a web browser;
- a word processor;
- the computer operating system, and file handling in particular.

E-mail is widely used for non-spoken communication, while dissemination of information via the Web/intranet is common, and many staff find it helpful to produce letters, lists, notices etc using a word processor. The use of the operating system, including basic keyboard and mouse skills, underpins it all.

An understanding of the use of the operating system is often particularly weak among those who are self-taught. Although experience shows the problem to be far broader, particular evidence comes from recent one-to-one work with academics at UEA concerning the use of computers in teaching and learning. Few academic staff afford themselves the time for formal training in using operating systems and it is common for the tutor to find herself explaining file structures and how to make use of them, or even routine matters such as how to copy and paste between applications.

Evidence from UEA on core skills

In the C&IT survey at UEA, staff were asked to rate their own skills in given topics. Opportunity was given to specify other packages/applications that were not on the matrix, but responses showed that the main areas had already been identified. The result, ordered by percentage of respondents with at least some skill, is as follows.

Perceived skill levels and demand for training (in percentages)

ACTIVITY/ APPLICATION	NOT ANSWERED	NONE	BASIC	AVERAGE	GOOD	ADVANCED	SOME SKILL	WANTING TRAINING
E-mail	1	2	14	35	35	13	97	16
Word processing	1	3	10	24	42	20	96	17
Web searching/browsing	2	5	25	29	27	12	93	19
File and disk management	5	17	24	23	21	10	78	15
Spreadsheets	4	27	25	18	20	5	69	22
FTP (file transfer)	6	49	18	11	10	6	45	10
Presentation packages	4	53	19	11	10	3	43	22
BIDS	5	52	14	13	11	5	43	9
Database software	5	53	20	12	7	3	42	18
Networked CD-ROM use	5	53	17	14	8	3	42	9
Desktop publishing	6	54	17	12	9	2	40	18
OPAC	8	60	9	11	9	3	32	4
Statistics packages	6	63	14	8	6	3	31	11
Web publishing	5	66	13	6	5	3	29	20
Reflections (student records)	6	66	8	8	9	3	29	8
Programming languages	6	76	5	4	5	4	18	5
QL (financial management software)	6	79	8	4	3	0	15	12
Other specialist packages	40	46	2	4	5	3	14	3
Use of video conferencing	6	87	4	2	1	0	6	9

Whatever the actual skills levels, this shows a clear 'staff C&IT skills core' (above the line). It contains no surprises. The suggested items head the list, with spreadsheets not far behind.

But within any given area, for example e-mail, what C&IT skills level might be appropriate? The answer must be 'at least to competently do the job'. This issue is taken up again under *C&IT qualifications and professional development*.

Some staff will require more than the defined basic skills set. They may need advanced skills in core software, perhaps word processing, or have need to use additional software. For example, some secretaries may need good desktop publishing or Web publishing skills, while managers may need skills with project management software. It can be helpful to determine and maintain check lists of C&IT skills needs for various groups of staff. Some HEIs (for example, the University of Bristol) have done this for use in recruitment, induction and staff reviews.

What might be done?

- Use a C&IT staff survey to identify, by staff category, existing levels of skills.
- Describe in broad terms the institution's expectations of basic competencies in the use of C&IT in relation to each category of staff, and monitor the effectiveness of recruitment, appraisal and promotion in realising those expectations.
- Undertake a role analysis to determine C&IT requirements for all roles within the institution¹. The common subset of C&IT needs would yield the basic skills set.
- Include in all job descriptions and person specifications statements about both basic and advanced skill requirements. Where appropriate indicate the desirability of associated expertise.
- Use the appraisal process to encourage staff to be explicit about their C&IT skills.

¹ We had anticipated that Higher Education Role Analysis (HERA), which has completed its development phase and is currently being piloted within HEIs, would provide a platform for this process. However, it can only do so indirectly. The HERA framework for job analysis can be used to size and assess the relative value of roles within an organisation, based on assessment of agreed job descriptions against a set of behavioural competencies. It remains for elements of each job to be associated with appropriate C&IT skills, as a separate exercise.

4.5 C&IT training and development

Where are you now?

- Some C&IT training offered by departments, with some central provision. Attendance is entirely by individual choice.
- Major central provision, supplemented by departments occasionally. Attendance largely on the basis of individual choice.
- Major central training provision though still within a voluntary framework, supplemented by departments, some departmental focussed training.
- IT training delivered in a variety of ways. Central course provision. Departmental focussed training, learning resources centre, one-to-one workplace coaching, self-instructional packages, problem based worksheets.
- C&IT awareness training provided for all managers.
- Emphasis on recruiting staff with the requisite skills. Access to training determined by line managers and linked to specific job requirements.
- Regular C&IT training needs surveys linked to C&IT skills development policy and C&IT skills strategy.

Discussion

Training provision

C&IT training is not an end in itself. Staff seek skills in order to be able to solve problems. They look for help anywhere along the continuum from informal help from a colleague to formal courses. This section is concerned with the provision made by the institution for the acquisition of C&IT skills. Evidence from the SCAITS project suggests that C&IT training must be available if C&IT skills are to be embedded. The quantity and quality of C&IT skills training across the sector is mixed. Some HEIs have a long history of excellence in such provision, while at the other extreme there are some that are only now starting to provide appropriate training.

However, SCAITS has brought sharply into focus the fact that HE staff are not a homogeneous group. Their roles are different, as are their working patterns, and also their views of what constitutes the most effective way to learn C&IT skills. To embed C&IT skills successfully means being able to offer a variety of models for learning, to meet a range of needs.

C&IT training is not, therefore, just about providing traditional taught courses, although these may provide the core of the present provision. It includes group teaching, tailored one-to-one work, and the provision of self-instructional learning materials. Neither must C&IT training be thought of only in terms of 'basic skills training', e.g. a beginners course in word processing or an e-mail package. It is just as important that those who need specific, more advanced, skills can also acquire them.

Central provision of C&IT training

At UEA, as in many HEIs, the main focus of training has been a programme of centrally provided courses. The training may be provided on-site or elsewhere. At UEA, centrally-organised C&IT courses are arranged for staff on-site if possible, whenever there is sufficient demand (defined, perhaps arbitrarily, as 9 or more participants) and a suitable tutor can be found, and provided there is budget to pay for it. There is normally no charge to the participants or their department, other than for course booklets that participants keep. A dedicated 12 seat staff C&IT training room supports a widely advertised programme of basic, 'further' and specialised C&IT courses, most of which are open to any member of staff. The vast majority of courses are led by members of the staff development team, of whom three people are heavily involved with C&IT skills training, and a fourth makes a significant contribution. Additional trainers are bought in as necessary, normally from the University or its Research Park, to cover specialist skills that the staff developers do not have. Advertised courses that are oversubscribed are repeated as necessary, and departmental requests for courses specifically for their staff are encouraged – with the possibility that standard courses can be tailored to departmental needs. With so many courses being run, the dedicated staff training room is intensively used and occasionally student C&IT teaching rooms also have to be employed for staff training.

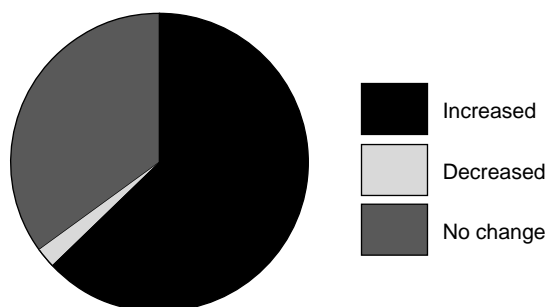


Figure 9: Change in confidence as a result of attending course _____

Evidence from the SCAITS work suggests that staff perceive tutor led courses as helping to build confidence. Two-thirds of UEA participants reported positively on this aspect. Other UEA evidence (below) provides an interesting picture of staff perceptions of their own confidence in using C&IT. A reasonable deduction would be that younger men in science appear to be the most confident.

Evidence from UEA: levels of confidence in using IT (in percentages)

Users were asked to place their confidence level on a rating from 1 (lowest) to 5 (highest):

	<i>Lower [1,2]</i>	<i>Average [3]</i>	<i>Higher [4,5]</i>
All	14	30	56
Maintenance, Security, Estates etc [N=29]	31	31	38
Humanities and Soc. Sci. Schools Grp [N=128]	18	39	43
Residences, Cleaners, Catering etc [N=13]	23	31	46
Administration [N=100]	13	34	53
Professional Schools Group [N=120]	20	21	59
Library, Comp.Service, Audio Visual [N=77]	14	22	64
Science Schools Group [N=128]	5	29	66
Aged 30 and under [N=119]	6	21	73
Aged 31-40 [N=200]	12	29	59
Aged 41-50 [N=215]	15	32	53
Aged 51 and over [N=184]	23	33	44
Males [N=315]	12	28	60
Females [N=396]	17	31	52

There is significant variation between respondents in different work locations, and between those in different age groups. The confidence of those from the groups with small numbers of respondents [N=29, 13] who are using computers in their work is lower than in other staff groups.

The following shows the take up of courses:

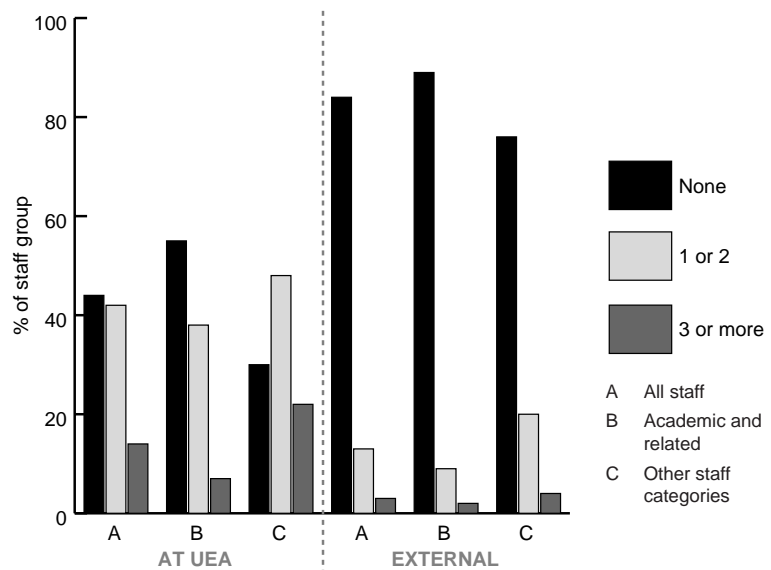


Figure 10: Evidence from UEA: C&IT course attendance 1997-99

On the face of it all would appear to be well. There is plenty of provision and demand is high, with good levels of satisfaction with the training reported by participants. However, a close look at the statistics and the evidence from follow-up evaluations suggests that C&IT courses (in common with all central staff development events) are attended mainly by staff in administrative and secretarial and clerical grades. Academic staff and manual staff make much less use of central training provision. The other problem that emerges is that a fifth of staff attending courses report that they had made no use of what they had learned one month after the course had finished. It is not clear why this is the case. It may relate to opportunity. It may be that some staff simply attend C&IT courses to maintain their levels of C&IT awareness rather than to apply their learning in the workplace. Many academic staff on the other hand view C&IT in an instrumental way, as a tool for solving problems, and do not feel able to give up the time to gain a wider understanding.

The need to offer a range of approaches to learning C&IT skills is driven not only by the awareness that a single approach is insufficient to meet the needs of different learners, but also by economics. As reported by some other HEIs, the demand for C&IT skills training seems insatiable. When asked what would enable respondents to use computers more effectively in their work, UEA staff put 'courses' at the top of the list (at 31% of respondents, well ahead of better/faster/newer computer at 21%). Certainly, demand for C&IT training at UEA would seem capable of soaking up all the resources thrown at it. While tutor-led courses will continue to play a significant part for the near future at UEA, there is no choice but to complement that provision by other approaches if the needs are to be properly met.

Not just courses: other approaches to C&IT training

1. Self-instructional learning

One answer to the high demand for C&IT training must lie in an increase in the use of self-instructional learning, rather than reliance on being taught in formal groups. However, experience at UEA and elsewhere is often that CD, workbook or video-based learning is unattractive relative to the traditional, tutor-led courses. Indeed, from the SCAITS 'Course Efficacy' sub-project 94% of the respondents felt that a tutor-led course was the most appropriate way to learn. Some illustrative comments:

"I learn more quickly by being shown rather than plodding through manuals full of techno-speak."

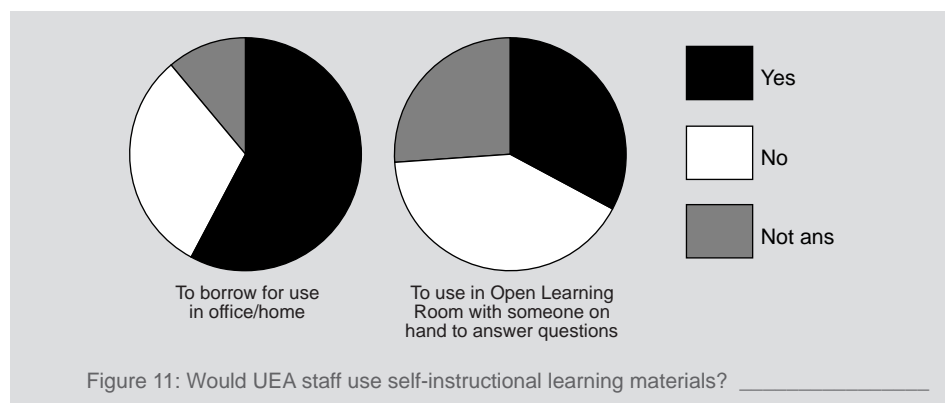
"I feel there should be more troubleshooting courses sharing the experiences of participants."

However 80% of managers/supervisors were in favour of other learning methods being available, with worksheets the most popular:

"Self-paced worksheets for specific topics, e.g. a merge/labels one for Word 97. Neither the staff nor I wanted them to attend the full Advanced course."

"If [using] computer based learning, could be spaced over longer periods of work time so that work-based tasks do not suffer."

A substantial majority of present course participants may prefer tutor-led courses, but from the main UEA survey, respondents were more positive than expected concerning other approaches.



Perhaps the culture is gradually changing; certainly self-instructional learning materials have improved over the years. Perhaps unmet needs drive their anticipated use.

Indeed, there are recent examples of successful Open Learning Centres (OLCs). For example, at the University of Sheffield the staff development unit set up an OLC known as SOLAR. They report:

“In a sense we’ve been victims of our own success. We set up Solar as an experiment and let it run to see where it would go. And it went much faster than we anticipated.”

There are other successes, but these seem to have in common the availability of staff so that OLC users feel supported. Some, like SOLAR, also provide *networked* computer based learning materials that can be used in the OLC itself, or elsewhere on campus, or (via dial-up) from home. The flexibility of access offered by such OLCs may be a key factor in reaching academic staff who, for example, constitute some 40% of SOLAR’s on-line users, while ‘visiting use’ of SOLAR as a physical location by academics is roughly in proportion to their population within the institution, at about 20%.

In general, the advantages of using self-instructional materials are normally associated with timeliness of learning, and (given appropriate equipment) flexibility of location. There are other advantages. Given adequate provision, minority topics can be catered for, perhaps in specialist areas. Different learning styles can also be accommodated, leaving the choice to the learner.

For example, there is no reason in principle why provision should not be made both for those who prefer to learn generic principles (e.g. about spreadsheets) and then move to specifics (how to do those things in, say, Excel), as well as for the majority who seem to prefer to learn specifics and then gratefully recognise the general principles if they later need to change software.

Unless self-instructional learning is encouraged, it seems unlikely that the staff training demands in an ever-changing C&IT situation can be met. These are not issues that can be fully controlled by the sector, which is driven not only by genuine technological progress but also by the almost continuous upgrade policies generated by a rapidly moving computer industry.

2. One-to-one tuition for academic staff

Although tutor-led C&IT courses may be well received and generally popular amongst staff, it is common across the sector to find lower rates of participation than might be expected among academic staff. At UEA, academic and related staff are only half as likely to participate in courses as other staff. Pressure on time is a major problem reported by academics at UEA, and confirmed by reports from other institutions across the sector. Lack of time to attend courses is also reported in the 1998 JISC Survey 'Study of the C&IT training being undertaken in HE Establishments in the UK' as a general barrier to all staff in respect of C&IT training. An approach which has successfully penetrated academic staff at UEA is one-to-one tuition.

Evidence from UEA: one-to-one tuition for academic staff

The UEA Web Officer works with academics on a one-to-one basis. Tuition is normally arranged in several one- or two-hour sessions to fit around the lecturer's commitments. The aim of this work is to help lecturers learn (over twelve contact hours) how to put their own course materials onto the Web, and within deliberately broad limits the tutor is happy to be flexible in what is covered. Thus C&IT competent lecturers will probably accomplish rather more than their less C&IT competent colleagues, some of whom may need to learn how to scan images and not infrequently also learn how to reference and handle files and folders. This one-to-one approach to training is, on the face of it, rather expensive but it is valued because it focusses on specific problems and has a direct impact on practice. It is delivered at a pace to suit the individual and the training is arranged to suit the member of staff's convenience.

The training is evaluated, and lecturers have noted unexpected benefits:

"Increased my confidence in C&IT."

"Gave me organisational ideas."

"Made me think about use of visual images."

"Increased my motivation."

"Learned a few PC skills not just relating to Web pages."

"Helped my overall grasp of file structures."

3. Turning C&IT non-users into users

The largest group of non-users at UEA is amongst manual staff. If C&IT skills are to be widely embedded then more flexible approaches to training will be needed. In recent years at UEA a three-hour course *Computing for Absolute Beginners* has attracted small (but growing) numbers of maintenance, estates, catering and cleaning staff. The course offers a non-threatening introduction to computers and computing. It seeks to demystify C&IT and give a confidence building, very basic, minimally technical understanding of how computers work and what they can do. It also explains which other C&IT courses might then be followed. A response from a recent end of session questionnaire typifies the reaction:

“Very educational and a lot of fun.”

This course has indirect benefits, too, in that it has served to open the eyes of some of these staff to other (non-IT) staff development activities that are on offer.

There are special problems of availability amongst many of these staff, making it hard for them to attend courses. Many work shifts or are part-time, while some have second jobs and are simply not available – even though they may be willing in principle to attend courses outside of their normal working hours.

Self-instructional materials would offer the necessary flexibility, but most non-users benefit from the flexibility and help of a ‘human’ approach, certainly until they have gained some experience and confidence. Consequently, at UEA an experimental scheme has recently been set up. A networked PC has been provided for a group of cleaners in a suitably accessible location, and one of the staff development team has specifically trained a volunteer from the group to mentor the others informally. This work is ongoing, but looks sufficiently promising to replicate in a more extended trial. Ideally, a networked PC would be provided in each of the major social spaces used by manual staff.

4. C&IT in creative problem solving

In designing flexible learning situations, HEIs can learn from other sectors. As part of the benchmarking aspect of the SCAITS project, a visit was made to the Innovations Laboratory run by the Post Office Research Group. This laboratory was set up to offer an imaginative experience of the future and a space for thinking and planning. It has a Creativity Zone that has been designed for creativity and team work. The walls are made of curving whiteboard, the ambient lighting is filtered and the area is equipped with networked laptops for groups of up to 12. Working sessions are facilitated by members of the Research Group and a portfolio of software tools has been assembled for team brainstorming, scenario building and data analysis. HEIs wishing to develop Dearing’s Type 42 managers might find this a useful model to consider.

Specialist C&IT training

Increased student numbers and shrinking resources mean that academic staff are looking to technology to support their role in learning and teaching. There are also other areas of specialist need, but shared by only a few members of staff at any given time. Economies of scale in terms of training may then be a problem.

While acknowledging the importance of C&IT in learning and teaching, some examples of *other* specialist or advanced needs identified at UEA include the following:

- Most researchers have need to learn to use at least some specialist C&IT tools. LaTeX is an example. LaTeX is a page layout programme with particular strengths in preparing articles for print that contain symbols used in mathematics, music and the sciences, where a normal word processor will have great difficulty in handling those symbols in a precise way. At UEA a few staff (and some research students) in each of a range of disciplines need to acquire LaTeX skills each year. By centrally co-ordinating the training in this identified minor requirement it becomes worthwhile running a course at UEA. Looked at (as formerly) on a departmental basis only, such a course would not be viable.

- There are many in administrative roles needing more advanced skills. For example, advanced spreadsheet skills specifically for those working in finance is a training need as yet unmet at UEA.
- Advanced skills could also include ‘inter-operating’, where various items of software are used in a co-operative way so that the individual’s work is made more straightforward. This can be extended to the notion of inter-operating between different networked computers, to facilitate the interdependent work of the members of an office or team.

A characteristic of many of these advanced needs is that those being trained may require development in more than merely the use of the software. Lecturers need a grasp of pedagogy as well as C&IT skills if they are to use the technology to best effect; for administrative, secretarial and clerical staff, effective inter-operating might go hand in hand with knowledge of good practice in office work; project management software is only useful if the user has some understanding of project management. Again, this suggests the benefits of proper integration of staff development activities, the C&IT skills not being seen in isolation.

Timing of C&IT training

As well as providing more flexible forms of training it may also be necessary to look at the duration of sessions and to take account of the time pressure that many staff are under.

Across the sector, the **duration** of a typical training session varies widely. Some HEIs favour full-day sessions so that participants can become really immersed in the topic. At the other extreme, another HEI expressed preference for *“regular ‘bite size’ sessions of one hour so that particular things can be learned as necessary and immediately applied.”*

Many HEIs seem to favour half-day sessions, as typically run at UEA. This duration was found to be most popular among the UEA survey respondents, with 60% in favour, while our shorter (1-1.5h) sessions were favoured by 33%. Full days were most attractive to only 7%.

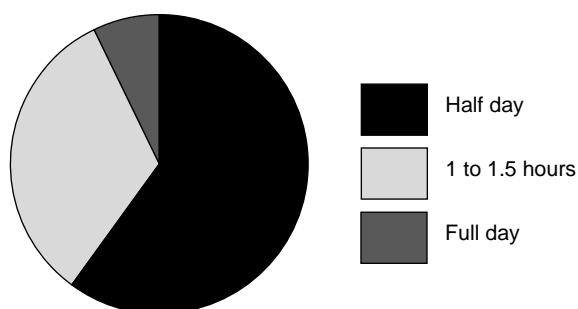


Figure 12: Course duration preferences

A total course may contain more than one session. What is the ideal **frequency** of sessions? At UEA, there is a slight preference for a series of shorter sessions (57%) over one or two longer sessions (43%).

Training by category of staff

The matter of **group composition** for C&IT training was raised in the UEA survey. Although this is unimportant to the majority, 34% wished to train with staff who do similar jobs. For some this seems to reflect a real desire to work with people having similar roles while, for others, the preference may mirror other comments that some of our courses need to be more specific and specialised:

“Courses are good – especially beginners courses. More advanced courses could helpfully be more specific... for a group with similar needs.”

Again, in respect of longer, more advanced courses one member of secretarial staff commented:

“We all use computers for different purposes. Probably only a small part of each course is relevant to each person.”

The ‘Course Efficacy’ sub-project confirmed that courses with participants of similar prior C&IT experience are more likely to result in greater participant satisfaction than those where there is a greater mix of prior experience. Specifying prerequisite skills, as done in promotional material for C&IT courses run at UEA can, in theory, help in this respect. In practice, such requirements may be ignored by those signing up as participants. Furthermore, not all participants come as total beginners to Beginners Level courses, and the amount of experience in the topic of a Further Level course may vary considerably between individuals attending. *“Wanting to extend my skills”* seems to apply as much to staff attending Beginners Level as Further Level courses. It is consequently rare to find a group of participants on a given course with very similar prior experience. It is the role of the tutor to try to ensure that the differences obstruct the overall progress of the group as little as possible, while maximising the learning of all participants.

The evidence suggests that:

- beginners level courses in any topic can be satisfactorily run in one or more half day sessions of mixed composition in terms of employment;
- further level courses should be run as short (perhaps one hour) sessions dedicated more closely to specific tasks, which in turn dictates the participants;
- all participants should meet specified C&IT skills levels as a prerequisite for attendance on any given course. Ideally, the prior C&IT skills of all participants should be as similar as possible.

Access to courses

There are issues of **course access**, in terms of location and time of day, and in terms of frequency of repetition.

- Where an HEI is split across several sites, is the course accessible to those from all sites?
- Is the course run at a time of day suitable for the target group?
- Are repeats of the same course staggered morning/afternoon and across days of the week, to help accommodate part time staff and those with regular commitments that would otherwise keep them away?

- Are courses repeated often enough to keep any waiting list at a low level?
- Are courses repeated out of teaching time to enable those with major teaching loads to attend?

C&IT training providers

Across the sector, responsibility has normally been assumed by staff development units or computing services, with specialist C&IT skills for learning and teaching often dealt with separately. Continuing education departments sometimes take on a C&IT training role; occasionally, the provision is primarily a departmental responsibility. However, competition between providers of similar training within the same institution is not unknown.

So, is there a 'best' solution for the HE sector? The answer is probably 'No', provided:

- Within a given HEI, responsibility for staff C&IT training lies in one place, even if delivery is shared between providers in a well managed and co-ordinated way. Providers can be in-house or external.
- Providers have an understanding of both strategic and user needs, and the vision and resources to be flexible in approach.

From experience, a 'one stop shop' for all staff development appears preferable, where development in one set of skills (C&IT, teaching, administration etc) is not divorced from another. However, separate provision for different staff groups and different kinds of skill development is widely found in HE, often more as an accident of history or personality than a deliberate plan.

Buying in courses from external C&IT training providers is favoured by some HEIs, particularly where the provider can deliver on-site. Sometimes there is a special relationship fostered with a 'commercial wing' of the HEI to do this kind of work, which usually relates to C&IT-based 'office skills'. The benefits are seen as only paying for what is needed, and being able to change provider if the service is unsatisfactory. Competition for the work can also keep the price down.

"We employ freelance trainers – we don't have to go on using them if they turn out not to be very good."

A similar remark was made by a staff developer from another university, who added:

"...but if they are really good then I look to take them on the staff."

In-house trainers are favoured by many. These may be staff with C&IT training as part or all of their formal role, or staff with the necessary skills who have been 'given a second contract', informal or otherwise. Sometimes, postgraduate students are employed in this work. A particular benefit of using in-house trainers lies in their knowledge of the local computing systems and familiarity with the institution, including sources of help and support. Some software is so specialised that non-HE trainers would, in any case, be difficult to find. Moreover, C&IT skills development may have to embrace approaches other than courses of the kind that can be easily bought in.

Provided the training delivered is of a good standard and sympathetically meets the need, it should in principle not matter from where it is sourced. However, to have no

in-house C&IT trainers makes more innovative approaches such as mentoring and one-to-one specialised training harder to implement, so hindering the embedding of C&IT skills in some groups.

**What might be done to develop
C&IT skills learning?**

- Review existing C&IT training provision across all staff categories with reference to the following:
 - (a) fitness for purpose;
 - (b) flexibility;
 - (c) accessibility;
 - (d) level;
 - (e) impact on working practice.
- Develop a coherent C&IT skills staff development policy as part of a C&IT skills strategy.

4.6 Help and support when using C&IT

Where are you now?

- Central Help Desk usually provided for part of the normal working day. Some departmental technical support.
- Central Help Desk provided *throughout* the normal working day (including lunch time).
- Central Help Desk supplemented by departmental support staff (or replaced by Departmental Help Desks). Self-help leaflets and/or on-line FAQs available.
- Readily available formal help as above. Also electronic discussion groups/lists for mutual help among users, and system of designated local support for each office and work group.

Discussion

An institution in which C&IT is embedded will provide ongoing help and support to its staff, because it is in the nature of using C&IT that problems will arise – not all of which can be solved without assistance.

Some problems are of a technical ‘one off’ kind, perhaps associated with hardware or network settings, where it might be unreasonable to expect the ordinary user to have the necessary skills. Others concern software usage, perhaps where an unfamiliar task is being tackled using an otherwise familiar package.

Good user training helps to minimise the need for assistance, and general familiarity with C&IT amongst staff leads to greater self-sufficiency. However, help and support is still necessary. If users cannot get help promptly, they are held up. The result may not only be frustration on the part of the user; particularly in the case of a hardware or network problem a broad spectrum of work may be affected, and productivity damaged.

The issues therefore concern the availability and nature of the help and support provided.

How do staff get help and support?

Self-help

Staff can help themselves by using manuals, guides, and leaflets, or on-line – for example from help systems and FAQs (Frequently Asked Questions, and answers). Staff also ask colleagues for help.

Problem solving sheets

The majority of staff at UEA are in favour of the provision (as at some other sites) of short ‘*How do I ...*’ guides either on-line or on paper. 18% of staff would like the information provided directly on paper. The advantage of this approach is that it is a quick way to solve immediate problems. Although at UEA some FAQs exist and leaflets are generated by certain departments for their own use, present UEA provision in this area is generally by more substantial training workbooks that can also be used for self-learning. There is a need to be met at UEA by ‘*How do I ...*’ materials, although an on-line (Web-based) system would be easier to keep updated. If necessary the information can be printed out. Popular topics at UEA for ‘*How do I ...*’ guides included the following:

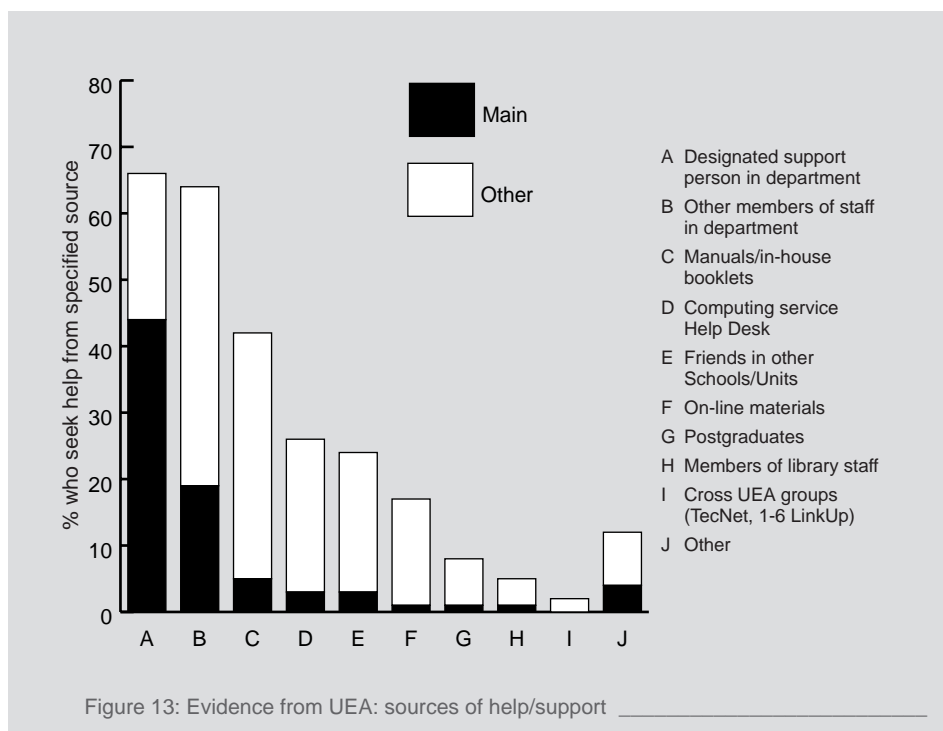
- aspects of Web use, ranging from down-loading of information to creating and designing Web pages;
- lists of 'quick tips' for standard packages, ranging from basic key strokes to clever shortcuts. Particular topics included (for Word) "*getting labels to print in single spacing*" and "*taking page numbering off*";
- self-help with e-mail, spreadsheets and desktop publishing.

On-line help

On-line help supplied with many software packages has improved over the years, and FAQs (usually Web-based) are increasingly available for software and services. Because it records user questions and the answers supplied, 'Help Desk software' used by many computing services in the HE sector can often help the assembly and updating of local FAQs. Where the problem is learning the detail of some unfamiliar task, on-line self-instructional course materials can help, provided there is a good contents list or index.

Help from people: formal support

When staff are faced with an immediate problem they are most likely to turn to people for support and this can be through formal or informal structures. Examples of formal structures are C&IT service 'Help Desks', and departmental IT support. In a very small HEI, a central Help Desk may be truly helpful to staff. However, in even a modest-sized institution such as UEA, local support for staff is far more important as the first line of assistance – where the major source of help is from the designated departmental support person, followed by other members of the same department. This is a common pattern. When things go wrong, what is more natural than to seek help from those immediately to hand?



Given the importance of the formal C&IT support role, support staff themselves need to be supported and encouraged to maintain and develop their skills. From SCAITS evidence this appears to be more likely to happen where they are employed by a department for whom this activity is core business, as with many computing services. It is a matter of perceived priorities. Staff employed to provide IT support in departments often found it difficult to access appropriate training.

Two further problems with departmental C&IT support arrangements were identified by some UEA users:

- The support is not always available – as, for example, when the support person only works in the department on a part-time basis. This reflects the immediacy of the need on many occasions.
- The C&IT support person is technically competent and can fix hardware and networking problems, and install software, but is not good at helping with ‘how to use’ or ‘how to do’ type problems. The response “*Look at the manual*” may sometimes be appropriate, but is not always constructive.

The latter problem can stem from the support role brief, where the need for application support may not be recognised. It can also stem from a predominantly technical focus of expertise and interest on the part of the support person. Indeed, experience suggests that many extremely competent technical staff may be less comfortable with the role of explaining or demonstrating C&IT skills to others. They may also be unwilling to find themselves in this role given its capacity to soak up time. Nevertheless, it would seem that what is most valued by users in departmental support staff is a broad base of C&IT skills, with a positive inclination to help the staff in their care with *any* aspect of their C&IT based work. This is a rather different role from that of a traditional technician.

In summary, the SCAITS evidence suggests that in an ideal world C&IT support is best provided on a departmental, full-time basis, by staff who are technically competent but highly ‘user friendly’ and conversant with the major items of software supporting the sorts of tasks their customers undertake. Whilst they may be deployed in departments, these staff might be best managed by a central support service which will take seriously the responsibility to maintain skills and expertise.

Help from people: informal support

Informal structures are provided by ‘people networks’ – immediate colleagues and other contacts, where their job is not formally to help others with C&IT but because of their skills they may do so, as a favour.

Sometimes, informal support can become a major burden to those providing it. At UEA, some secretarial staff reported that they are asked ‘*frequently*’, ‘*daily*’ or even ‘*hourly*’ for advice, and queries from colleagues have (to some) become ‘*a nuisance*’ or even a ‘*constant interruption*’. Indeed for some staff it seems to have become part of their job to act as a support person for their office or group. Over time this can lead to a significant but unacknowledged change in the job description. If this is recognised in terms of workload and expectations it can represent career development and progression, especially where it is supported by the opportunity for specialist training. With lack of

recognition, however, such a situation is likely to lead to increased stress and a spiralling dissatisfaction. Moreover, unless it is a very large team, if interruptions are really received 'hourly' it does call into question the basic skills of those concerned, and suggests the need for departmentally focussed training sessions. As the demand for high levels of C&IT literacy increases, managers need to be alert to what is happening on the ground and willing to review the changing needs of staff in terms of support.

Beyond the individual's department, contacts and groupings at UEA generally play a relatively minor role in the provision of informal C&IT support. SCAITS looked at the impact on C&IT support of the 1-6 Link Up which is a UEA network for secretarial and clerical staff, supported by the Centre for Staff and Educational Development. One of the early tasks the network set for itself was to produce a paper based *1-6 Link Up IT Skills Directory*. The exercise was valuable at the time but the information quickly became out of date and there is little evidence that it was used to access help. This may be because, around the issue of help and who gives and who takes, there exist all sorts of unwritten rules and conventions. In contrast 1-6 runs two very successful e-mail groups. One exchanges work related information and requests for help, while via *Adlink* the names of plumbers can be exchanged and bicycles bought and sold – C&IT figures only in terms of equipment-related requests.

More broadly for staff there are also C&IT topic-specific groups supported by e-mail lists, where help and advice is exchanged. However, in terms of *general* C&IT help and support, proximity and immediacy are most important.

How easy is it to get C&IT help?

Taking UEA as an example, it would be reasonable to suppose that through its central Help Desk and a system of departmental support, together with informal support, the institution might be reasonably well served.

However, the results show considerable variation between groups; the meanings of the group labels in the table below is unimportant here. What is important is that for some groups, there are clearly matters to address. The following results indicate user perceptions, which are necessarily bound up with feelings of isolation and with confidence. It is difficult to separate cause and effect. Do difficulties with accessing C&IT help and support cause feelings of isolation, or are difficulties with accessing C&IT help caused by isolation?

Evidence from UEA

The ease of obtaining help with C&IT problems varied significantly according to whether respondents were located in Schools (indicated below by Sciences, Prof, HSS) or in the ISD (Library, Computing Service, Audio Visual Service), or not. Overall 27% of respondents found it difficult or very difficult to obtain help, but this percentage rose to over 50% for respondents located in the Staff and Student Facilities and Amenities (SSFA) and Residences groups, and to 45% for those who felt isolated from others doing similar work. There were some differences between staff categories but these were not significant. For the small number of respondents in the manual/general and other categories this is most likely to do with isolation.

Ease of obtaining help with C&IT problems
(in percentages)

	VERY DIFFICULT OR DIFFICULT	NEUTRAL	EASY OR VERY EASY
All [N=715]	27	31	42
SSFA [N=25]	52	44	4
Residences [N=13]	54	31	15
Estates [N=29]	41	35	24
Admin [N=106]	33	41	26
HSS [N=143]	28	31	41
Sciences [N=198]	27	32	41
ISD [N=76]	16	33	51
Prof [N=125]	15	19	66
Isolated from others [N=126]	40	39	21
Not isolated [N=533]	22	30	48

20% of respondents indicated that they felt isolated from others doing similar computer related work. This percentage varies across staff groups and work location:

Variations in percentages of respondents who felt isolated

Percentage of all respondents feeling isolated from others doing similar work =20%

ALC/OR	11	Sec/clerical	18
Academic	19	Research	21
Tech/maint	33	Manual/general	39
Other	50	ISD	13
Admin	15	Prof	18
Sciences	18	Academic Units	21
HSS	22	Residences	28
SSFA	32	Estates	42
Confidence level 5*	15	Confidence level 4	16
Confidence level 3	22	Confidence level 2	25
Confidence level 1	43		

**Level 5 is very confident. Level 1 is little/no confidence.*

Respondents who did feel that they were working in isolation found it more difficult to get help with IT problems and were more likely to ask colleagues for help than a designated support person.

What might be done?

- Review the nature of present support. Is it of the right kind? Are there different options? Are suitable people in the role? What paper-based and on-line mechanisms are available to facilitate greater self-help, or to give the possibility of help at any time?
- C&IT support is important. What is the best model for managing the provision? Departmentally based or centrally managed but departmentally focussed?
- Review the future with managers and staff. What will the picture look like in five years time? What kind of C&IT support service needs to be developed? Will there be more Web developers and graphic designers and fewer secretarial staff? What kind of opportunities for career development should HEIs be planning?

4.7 C&IT qualifications and professional development

Where are you now?

- No opportunities offered by the institution for staff to gain C&IT accreditation or qualifications, although C&IT training is available.
- As above but staff also have access to externally run accreditation.
- Some C&IT accreditation offered in-house, but take-up largely governed by individual choice.
- A basic C&IT accreditation system is available in-house. Staff are either recruited with the requisite skills or encouraged to demonstrate competence through accredited programmes.
- C&IT job related skills are specifically linked to levels of accreditation. Staff are either recruited with appropriate qualifications or required to undertake training within specified timescales.
- Staff are given financial support to gain specialist C&IT qualifications.

Discussion

What part does accreditation play in embedding C&IT skills?

All staff have occupational roles. The use of C&IT within those roles varies, but it may be possible to identify a basic level of C&IT competence that all staff can be expected to demonstrate. Many staff will need specific, additional C&IT skills above that base level, which relate to their particular job.

If appropriate C&IT qualifications can be identified then we have, in principle, a mechanism whereby staff can demonstrate that they have reached the necessary level of expertise. In terms of professional development, it may be possible to identify an appropriate series of C&IT courses and/or qualifications for those in specific roles, although it would be futile to work out schemes for those roles where existing professional bodies already have their own well-established continuing professional development (cpd) schemes.

As in any other area, the value of accreditation is that it clearly demonstrates a level of competence against external verifiable criteria. In requiring specific qualifications an institution is hoping to set standards and guarantee levels of expertise within particular roles or functions. The widespread introduction of baseline C&IT skills accreditation in HE may be a long way off. However, HEIs will start to test for C&IT skills when their possession becomes critical to the capacity of the individual to do the job. The SCAITS survey of UEA staff found that many support staff were interested in gaining some or further C&IT qualifications (average 62%), although for academic staff the interest level was only 12%. Younger respondents were generally more enthusiastic.

Mechanisms for setting an appropriate C&IT skills baseline

The two main contenders at present are the Computer Literacy and Information Technology (CLAIT) scheme and the European Computer Driving Licence (ECDL). Both are at a suitable level for general use. ECDL has been said to compare roughly with NVQ level 2.

Computer Literacy and Information Technology (CLAIT)

CLAIT was established in 1984 by the Royal Society of Arts (RSA) and so far has been the most popular basic IT qualification in the UK. CLAIT is offered by a number of HEIs, usually to staff but sometimes to students, and it is widely available to all via the FE sector.

CLAIT requires candidates to demonstrate competence in three selected C&IT topics, out of fifteen provided (tests in still other topics can be certified as acceptable, by arrangement). At UEA, for example, testing in word processing, spreadsheets and databases is routinely offered to staff, with tests in graphical representation and desktop publishing also available. CLAIT tests accuracy in task performance as much as knowledge about the particular area of C&IT.

The following illustrates the requirements of candidates made by CLAIT, in respect of spreadsheets.

CLAIT requirements for spreadsheets

Assessment objective

1. Create a spreadsheet and enter data
 - 1 *Initialise the application*
 - 2 *Enter text*
 - 3 *Enter numeric data*
 - 4 *Enter formulae*
2. Edit and manipulate a spreadsheet
 - 1 *Edit spreadsheet data*
 - 2 *Replicate entries*
 - 3 *Extend spreadsheet*
 - 4 *Generate new values*
3. Use spreadsheet display features
 - 1 *Left and right justify text*
 - 2 *Change column width*
 - 3 *Use integer and decimal formats*
4. Save a spreadsheet, print its contents and exit the application
 - 1 *Save spreadsheet*
 - 2 *Print spreadsheet display*
 - 3 *Exit from application with data secure*

Although only three tests must be passed to achieve CLAIT, additional topics can be followed at that level (RSA Stage I) and a more advanced level (RSA Stage II) is also available. During 1999 RSA became part of a group known as OCR (Oxford, Cambridge, RSA) which now has responsibility for CLAIT.

The European Computer Driving Licence (ECDL)

ECDL is a more recent, broader based accreditation system. ECDL is a pan-European qualification, which has attracted a great deal of interest from both the public and private sector in the UK. It is also gaining popularity in other parts of the world. A number of HEIs in the UK offer the ECDL to staff and/or students. The UCISA Staff Development Group is active in tracking ECDL developments for the HE sector.

Under ECDL, competence is tested in seven modules (topics). These are:

- basic concepts of information technology;
- using the computer and managing files;
- word processing;
- spreadsheets;
- database;
- presentation (e.g. use of presentation packages, such as PowerPoint);
- information and communication (Web and e-mail).

In assessing a candidate's performance, minor mistakes are not penalised as heavily as in CLAIT. EDCL rates an understanding of the C&IT principles as of primary importance. Where modules are in common, the syllabus is similar to CLAIT. The level of competence required in any area is also similar, but ECDL requires competence in more areas.

ECDL literature states the target population for the ECDL as anyone who wants to use a personal computer competently at a basic level.

“The Knowledge Areas and Skill Sets included in the ECDL Syllabus are those recognised by expert practitioners ... as being necessary to cover basic knowledge and competence in using a personal computer and common computer applications.” (<http://www.ecdl.com>)

Although an institution might consider that a particular staff group requires passes in only a given subset of ECDL modules, the ECDL cannot be awarded until success has been achieved in all seven modules. An advanced ECDL is planned.

Evidence from UEA

A small group (12%) of respondents already had some IT qualifications. These are listed below, roughly divided by awarding bodies. The majority of these qualifications had been gained prior to the respondent joining UEA.

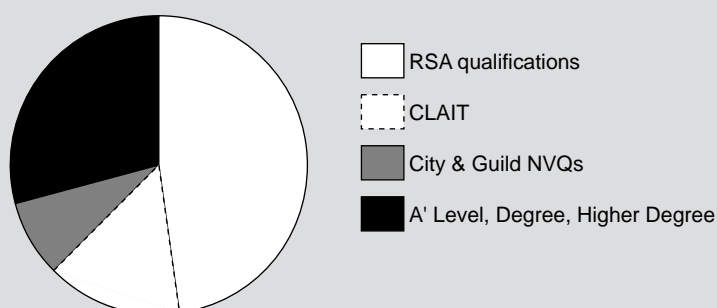


Figure 14: IT qualifications already gained [N=88, ie those with qualifications]

There was clear interest in gaining either further or some IT qualifications. Across all groups of respondents 36% expressed an interest but for several groups of staff this percentage was significantly higher (see table below).

Most respondents were unsure what qualifications they were interested in achieving, but around 20% (of the 36% interested, ie 6% of all respondents) did give some indication. Of the qualifications mentioned more than once, those of main interest were (in order of decreasing popularity): CLAIT, Microsoft qualifications (particularly MCSE), RSA Level I and II. Only MCSE attracted interest across most staff groups. CLAIT and RSA were specified mostly by secretarial and clerical staff.

Staff groups with particular interest in gaining IT qualifications

Staff group	%	Staff group	%
Manual/general	71	Already some IT quals	72
Tech/maintenance	66	Have no IT quals	33
Sec/clerical/lib asst	60	Aged <31	53
Research	30	Aged 31-40	39
ALC/OR	28	Aged 41-50	41
Academic	12	Aged >50	23
Non acad related	62	Not based in Schools	51
Acad & related	21	Based in Schools	31
All	36	All	36

Other accreditation is available or being developed. For example, QCA is currently piloting a single Key Skills qualification that embraces communication, application of number, and information technology. This qualification is expected to become generally available from September 2000, and may be suitable for setting a C&IT skills baseline.

A second example is the Microsoft Office User Specialist (MOUS). However, the standard required for a basic 'proficient' level MOUS qualification is much higher than for CLAIT or ECDL, and for that reason unattractive for baseline skills purposes where all staff could be expected to eventually succeed.

These other qualifications, such as MOUS, may have a role in later professional development, where specific skills need to be developed and tested.

Moving to a wholly C&IT accredited work force would be a major task. Automated testing would help enormously. This is already offered for the ECDL, and soon to become available for CLAIT.

There are major training implications – some staff would need a full course to bring their skills to the required standard, some would need to top up certain skills, others would need little more than a practice paper before doing the actual test. If, in parallel, the HEI places more emphasis on recruiting staff with baseline C&IT skills, then training activities could eventually be refocussed towards the needs of more advanced users.

Above the baseline

CLAIT and ECDL have value in setting and testing baseline skills but there are many other C&IT qualifications available which HEIs might wish to encourage staff to pursue in order to achieve not just breadth of skills coverage, but also depth. Where academic expertise exists in information science and educational technology then staff may be able to access ‘in-house’ qualifications. There are also many C&IT related accredited distance learning courses which HEIs could encourage staff to follow.

What might be done?

- Consider the costs and benefits of setting C&IT skills standards for some or all staff.
- Test the market amongst staff for the accreditation of C&IT skills.
- Introduce a pilot accreditation framework such as ECDL.
- Review staff development policies. What support is given to staff wishing to acquire C&IT qualifications at all levels?
- Look at the potential for exploiting current undergraduate or masters level courses for staff.

4.8 C&IT skills and recruitment

Where are you now?

- There is no institutional requirement to produce job descriptions or person specifications. Advertisements may or may not indicate levels of C&IT skills. There is no monitoring of the process.
- Skills are assumed but untested at interview. It is the responsibility of the individual to learn the skills necessary to do the job. The profile of C&IT skills in recruitment is variable.
- All posts are linked to job descriptions or person specifications. All recruitment literature includes details of required and desirable skills. The recruitment process is monitored centrally.
- All applicants are required to provide evidence and/or be able to demonstrate at interview a level of C&IT skill appropriate to the post.

Discussion

What prominence should C&IT skills have in the recruitment process?

In order to achieve any satisfactory appointment, all required skills should be made clear to candidates in the associated recruitment literature, i.e. the advertisement and further particulars. It follows that the job content (if not a detailed and precise job description) *must* be considered carefully in advance. Job profiling and (here) the determination of appropriate C&IT skills (see 4.4) is a necessary first stage in making a satisfactory appointment.

Compared with the non-HE benchmark organisations, where a detailed job description (and in some cases a person specification) is seen as a prerequisite to filling a post, examination of recruitment literature at UEA shows that line managers often try to offer more flexibility, with the intention that the job can be shaped to the qualities and interests of a good applicant. Experience of the equivalent literature from other HEIs suggests that UEA is not alone. This may be appropriate to certain types of post in HE, although *every* post will have identifiable core tasks and associated skills that could be stated in the recruitment literature.

At interview, good practice requires that appropriate knowledge be probed and, in the absence of strong evidence of competence, appropriate skills tested. The more important the skill to the role, the more crucial it is that it is thoroughly tested. For example, applicants for appointments with teaching or training responsibilities should be asked to give a short presentation; secretarial and clerical staff should be given a short word processing task; administrators might be given a short spreadsheet task to complete. An examination of interview practice at UEA revealed that this kind of thoroughness is often, but not always, found.

A particular problem arises, however, with the implicit nature of some skills. What should be specified in the recruitment literature, and tested, and what need not?

For example, all applicants for jobs in HE are expected to be able to read and write, at least to a basic level. Unless particular writing skills are required, such skills are not

normally mentioned in the recruitment literature, although judgements are made about their writing competence from the candidate's application form. However, in practice not all staff are recruited on the basis of application forms and there may be some manual staff who have literacy problems.

Again, applicants for a secretarial post would normally be expected to be competent typists, so that particular skill may not be specified as a requirement. However, the requirement to be able to use a word processor might be specified, or even a particular word processor such as Word or WordPerfect, because at present not all applicants will necessarily have those particular skills.

Indeed, what is implicit and what needs to be made explicit will change over time. In time past, the ability to read might have been important to specify and test as a necessary skill for many jobs; now, it is an assumed skill.

Currently, C&IT skills still fall into the 'needs to be explicit' category. At UEA, the practice in this respect was found to be variable and although most appointments examined were considered 'successful', the investigation triggered a reminder to all departments about the profile and testing of skills within the recruitment process.

There have been instances reported where the recruitment process has gone wrong, as a result of not highlighting necessary skills. Generally, recruitment literature for academic posts in HEIs makes little or no reference to basic C&IT skills, presumably because applicants are assumed to have those skills. The consequences can be problematic:

“The [lecturer] appointment was made, with no reference at all to C&IT skills – either in the information provided to candidates or at interview. And yet one of the immediate tasks turned out to be the teaching of basic IT skills, which the new lecturer was totally unable to do. The embarrassment and organisational and managerial repercussions were substantial.”

The role of recruitment in embedding C&IT skills

C&IT skills can be explicitly required, at any level, to suit the particular post. This will play its part in gradually embedding C&IT skills within an HEI. However, recruitment can also be used strategically, as part of an institution's IT skills strategy.

In that case, an institutional C&IT skills *baseline* should be agreed, and all those appointed from a given date would then be expected either to have those skills before appointment, or gain them before their appointment is confirmed following the usual probationary period.

If combined with a fixed term project to ensure that existing staff become skilled to at least the same level as the new recruits, one can then in principle envisage the HEI achieving at least the baseline C&IT competence across all its staff on the time-scale of that project. This baseline of competence would then, of course, be ongoing.

Evidence from UEA

At UEA the Personnel Office co-ordinates recruitment but the actual process is devolved. The provision of relevant C&IT information in recruitment literature (advertisements and further particulars) was found to be very uneven, and the provision of such information bore no consistent relationship to how important those skills were judged to be in the role. Where present, the information ranged from 'Computer literacy required' to detailed specifications.

Academic positions

C&IT skills were not reflected *at all* in recruitment literature for the academic jobs studied, even where those skills had been identified as essential.

In most instances the process did result in the appointment of those with the necessary skills. However, successful appointments rely entirely on the assumption that all applicants recognise that a certain level of C&IT skill is implicit in the role.

Academic-related positions

68% of vacancies studied had relevant C&IT information in the recruitment literature, although this information was given for only half of the vacancies where skills were judged to be essential. Where the C&IT skills were made explicit they were also assessed at interview, either by questions or some form of competence test.

Where a consistent attempt was made to represent and assess C&IT skills, the appointments were successful in terms of skills match. Where no attempt was made the results are varied, with a roughly even split between successful and unsuccessful appointments in terms of C&IT skills.

Other positions

64% of vacancies studied had relevant C&IT information in the recruitment literature. This information was given in three-quarters of the vacancies where C&IT skills were judged to be essential. Where the skills were deemed essential, they were generally assessed at interview either by questions or test.

Successful appointments, in terms of required C&IT skills, were made in most cases.

In summary

The success of appointments at UEA in terms of the necessary level of C&IT skill is varied, and appears to be dependent on the level of representation of the skills in recruitment literature and some assessment of the skills in the selection process.

What might be done?

- Review your existing practice. How are C&IT skills represented in recruitment literature?
- Can recruitment systems be improved? How is the recruitment process managed and by whom?
- Are there recruitment and selection guidelines available to managers?
- Should there be appropriate C&IT skills prerequisites for candidates?

4.9 C&IT skills and promotion

Where are you now?

- C&IT skills are rarely explicitly considered in the promotion process, other than for technical IT related posts.
- Criteria for promotion include some reference to C&IT skills.
- Appropriate levels of C&IT skills are necessary before staff can be promoted.
- The demonstration of exceptional levels of job-related C&IT skills is a criterion for promotion.

Discussion

Are staff who apply highly developed C&IT skills in their work more likely to be promoted? If it were the case, would it encourage others to follow suit? Could HEIs use the promotion process more effectively as a lever in embedding C&IT skills? The SCAITS project looked at UEA and found that currently the possession of C&IT skills appears to count for little in the promotion process. The exceptions are where:

- such skills form the main basis of the job, rather than support it, as in the case of mainstream C&IT roles;
- C&IT skills are integral to the research process (for example in the development of new C&IT based research techniques).

Evidence from UEA

- The academic and academic-related (administrative) promotions processes are structured in such a way as to reward the 'outputs' of the role (the quality of performance in teaching and administrative roles, and publications record) rather than seeking to evaluate and reward the component skills (or 'inputs') that form the processes leading to those 'outputs'. As C&IT skills are invariably one of a number of those 'inputs' there is no specific mechanism for assessment and thus the skills struggle for recognition as part of the current promotions process.
- The Non-Teaching Staff Annual Review process would appear to have the potential to reward C&IT skills as the grading systems reflect attainment of specific skills and styles of behaviour. However, there is currently no emphasis or reflection of C&IT skills as a separate category.
- The award of special increments and discretionary payments again have the potential to reflect C&IT skills but the current structure and practice (for example, the illustrative cases used to encourage managers to think about performance in role) do not provide the capacity to use, or encourage the use of, C&IT skills as a separate category for reward.

Some HEIs already take a different stance. For example, C&IT skills in support of learning and teaching might be recognised in the promotion process for lecturers, and it is possible to envisage the situation where other specific C&IT skills are rewarded – where it is in the interests of the institution to encourage them.

It is recognised that C&IT skills are generally applied in order to accomplish a task, and are not normally an end in themselves. For promotion, excellence in the task will normally be sought rather than in supporting tools. Nevertheless, the presence in any staff group of a particularly C&IT skilled colleague who is willing and able to share their expertise with others is a great asset (see section 4.6 *Help and Support*) and in that situation there may be a case for promotion on the basis of the C&IT skills themselves, or the allocation of a special increment or discretionary payment.

It is arguable whether *basic* C&IT skills (more or less than other key skills) should be directly rewarded through the promotion process. However, C&IT competence *beyond the basics*, and particularly as applied to *specialist areas*, might reasonably be expected to play a part in the promotion process.

To avoid rewarding the possession rather than application of skills (for example, achieving a certificate in the advanced use of a piece of software) evidence of the use of an appropriately advanced level of C&IT in support of job tasks could be set as a *necessary pre-requisite* for promotion. For example, in some HEIs, a lecturer might be expected to demonstrate competence in creating Internet-based distance learning materials as a pre-requisite to consideration for promotion to senior lecturer.

Whatever is done, giving C&IT skills a place within the promotion process will send a clear signal to staff that such skills do matter, and consequently support the embedding of those skills.

What might be done?

- Review existing promotion criteria. Are they sending the right message for your HEI on the importance of C&IT skills?
- Review promotions documentation. Could a shift in emphasis or use of examples highlight the value of C&IT skills?
- Review the appraisal process. To what extent does your appraisal documentation encourage staff to be explicit about C&IT skills?

Section 5 Anatomy of a Higher Education Institution

This report is based on evidence gathered from a variety of sources, although the in-depth examination of staff C&IT skills-related issues in one institution (UEA, Norwich) underpins the work.

The full extent of the UEA investigation is broader than the results reported here might suggest, because it was necessary to explore widely in order to determine the main issues relating to the embedding of C&IT skills. This report focusses on a substantial subset of the results, as evidence in support of those issues.

The purpose of this section is to describe the approach taken by SCAITS in examining its host institution.

Research into the staff C&IT skills situation at UEA was particularly informed by a number of **sub-projects**. These were:

- a substantial *C&IT Skills and Use* survey of all UEA staff;
- an investigation of the place and profile of C&IT skills in UEA recruitment and promotion practice;
- an examination of the role of informal 'people networks' at UEA in embedding C&IT skills;
- an investigation into the efficacy of central C&IT staff development and training at UEA;
- a comparative study of approaches to C&IT skills development in different Schools/Units at UEA.

Each is now described in turn.

C&IT Skills and Use survey of all UEA staff

The aim was to discover what we could about C&IT skills and use, across *all* UEA staff.

As with any survey, the critical requirements were to ask the right questions, and to achieve the highest possible response rate. The two are related in so far as the more relevant staff felt the questions to be, the greater would be the likelihood of a good response.

It was important, therefore, to engage staff from an early stage in order to ensure that common issues were identified and that their concerns were reflected in the questions asked. In order to achieve this:

- Articles were placed in the main University magazine, *BroadView*, and in the Information Services Directorate's *ISD Update*. Both have extremely widespread distribution within the University. Internal UEA e-mail distribution lists were also used. In both cases, the overall project and its aims were described, the survey announced, and the focus groups advertised.
- Focus groups were run with members of a number of specific UEA staff groups or their representatives. Possible non-user (or low-user) groups were included. 'Open' groups were also run, where any member of staff was welcome. The former attracted a better take-up than the latter, but the availability of the 'catch all' meetings was appreciated by those who did attend. Internal e-mail distribution lists were also used to solicit possible questions.

These approaches not only generated interest across a very wide spectrum of staff, but produced a huge range of possible questions. These helped the project to select key matters. Put alongside the project's own ideas and particular information needs, a major problem was to keep the number of questions and size of the questionnaire to a minimum, while still getting useful results. This was important given that the longer the questionnaire, the more motivation would be required to complete it.

Moreover, it was recognised from the outset that a minority of UEA staff currently do *not* use computers in their work. From the point of view of embedding C&IT skills, their responses would be as important as those from the majority, and much thought was given to how the questionnaire might usefully embrace this group. Nonetheless the final outcome left us wanting to ask more of the 'non-user' than space would permit. It was decided that if more information concerning this group was required, then it would have to be gathered separately.

Again, it had also been anticipated from the outset that the questionnaire was likely to be substantial in size. It was therefore decided to offer draw prizes to encourage a good response. Commercial organisations having links with the University were approached for sponsorship, with the promise of their names going on the questionnaire and the provision of further publicity when the prizes were given at a sherry reception hosted by the Vice-Chancellor. This enabled us to offer a total of 16 prizes, two being substantial (first prize being a new PC, second being £250 worth of travel vouchers) and the remainder being smaller but still most useful (e.g. £10 book tokens).

Working with a survey professional, a small pilot was run before producing the final questionnaire of ten sides of A4, containing almost sixty questions, many having multiple parts. The questionnaire as issued is included at Annex A, and supplied as file *mainq.rtf* on the provided disk.

Several questions involve self-assessment of C&IT skills. It is appreciated that people may judge their skills differently, but any alternative would have extended the length of the questionnaire significantly. It was considered more important, given the concern with attitudes as well as facts, that plenty of opportunity for free-form response was provided. There was a detachable front sheet so that names could be entered for the draw, while keeping the associated data anonymous.

Using the UEA payroll database to generate mailing labels, 2081 questionnaires were distributed. Roughly three weeks was given for replies to be returned. General reminders were issued by e-mail to distribution lists, and given by word of mouth whenever possible. A 41% response was obtained. Gender, age and group response profiles generally reflected institutional profiles. 86% of the respondents were computer users, 14% non-users. For a questionnaire of this size, this response was good.

SPSS was used to analyse the numeric and category based responses. LIMDEP was used to examine factors affecting reported skills levels. The free-form responses were simply grouped by question (with sub-groupings where deemed helpful, e.g. staff category) for visual analysis.

The Executive Summary of the survey results was published in the University newsletter and in the Information Services Directorate newsletter, to give those who had responded

some 'high profile' feedback on the results. The analysis was formally reported within the University in full, through limited runs of printed materials and also via the UEA intranet, and has formed the basis of a number of presentations and workshops.

This survey proved extremely useful but, as with all surveys, there is always room for improvement. For example:

- inclusion of a glossary of technical terms;
- expanding and moving the non-user section from the back to the front;
- checking assumptions – references to desktop publishing were variously interpreted as relating to desktop publishing *packages* (which was the intention) or the activity in general, perhaps using word processors;
- use of sub-set questionnaires to focus on particular staff groups.

An investigation of the place and profile of C&IT skills in UEA recruitment and promotion practice

Study 1: Recruitment

A review of current UEA recruitment literature (in the form of vacancy advertisements and further particulars) was linked to a consideration of the selection processes and techniques in use across UEA. The objective was to examine what is included and excluded from the recruitment and appointment procedures with regard to the use and importance of C&IT skills.

Four tasks were identified:

1. Describe the current processes used for advertising and selection.
2. Conduct a detailed study of externally advertised vacancies across the spectrum of UEA staff.
3. Conduct a semi-structured survey of managers and successful candidates.
4. Conduct interviews with managers and appointed candidates.

A recent six month period was selected for the investigation, in order to include a wide range of job types.

In principle, recruitment to some 150 jobs was to be examined. However, some parts of the process are carried out centrally via the Personnel Office, the remainder by the particular recruiting area within the University. Issues of the latter holding incomplete or non-existent records associated with non-teaching vacancies were immediately raised. Furthermore, some recruiting areas did not respond to requests for information. As a result, data for 75 vacancies over the six month period was gathered.

The semi-structured surveys were short and of a self-complete kind. The manager survey had a return rate of 55% and the 'successful candidate' survey a return rate of 70%, giving a reasonably complete picture.

However, the last task (interviews) was more difficult to achieve, given that the study was seeking to examine cases where the records were reasonably complete, where both the manager and successful candidate were willing to be interviewed, and where

representative cases from the various recruiting practices were sought. In the event the study interviewed five managers and two new joiners. The detail gave valuable insights into specific cases, but the number of cases is clearly too small to enable general conclusions to be drawn.

The basic questions used were:

To Line Managers

What role did you play in the recruitment of [name]?

How did you decide what C&IT skills were required for the job?

How did you know the standard of C&IT skills that the job required?

In what ways were you able to use the advice from Personnel in this appointment?

How was the short listing conducted?

What form did the final selection take?

How have you assessed the success of the recruitment process?

What, if anything, have you done extra for the new member of staff?

Imagine the best person for the job. Describe to me what you see as this person's C&IT skills.

If you were to recruit to this post again, what would you do differently?

To New Joiners

When you considered applying for this post, how important was it to you that the job used your IT skills?

How important did you think your IT skills would be in getting you the job?

How did you know the standard of skills that the job required?

How did you use your knowledge of the IT requirements of the job?

How were your IT skills checked during your application process?

How have you used your IT skills since starting your job at UEA?

In what way could you use those skills more at UEA?

What have you had to do to make your IT skills fit your new job?

How do you think the recruitment system could be improved?

Imagine the ideal IT related skills for the job you do. What would make you fit this ideal?

If you were able to wind back the clock and apply for this post again, what would you do differently?

Study 2: Applications for promotion

This study set out to consider both the promotion process, and practice. It sought to discover how effectively the need for C&IT skills in a role are assessed and weighted in the context of the skills offered by the applicant. The objective of the study was to examine what part C&IT skills plays in determining promotions, special awards or incremental increases.

Two tasks were identified:

Task 1 – give a broad overview of the current processes used for promotion across all staff categories at UEA (via a literature review), and identify any place C&IT skills might have in that.

This first task was completed successfully.

Task 2 – conduct a detailed study of Promotions Committee and Annual Review activity for the year 1997/98.

This second task involved a small pilot study of 12 cases, selected at random from the Academic, Non-Academic and Non-Teaching Staff promotions records for the academic year 1997/98. This period was chosen as it provided the latest complete year's record of promotion cases at the time of the study.

Given the confidentiality of the records, they were only seen by the member of Personnel Office staff who was involved in the sub-project.

In order to complement the information available a survey was sent (via e-mail) to each manager who had been involved in putting together the case for promotion. Amongst other details the following information was sought:

- the nature of, and justification for, the promotion request;
- whether C&IT skills are used in the role and how important they are (essential or desirable);
- whether C&IT skills were relevant to the recommendation for promotion.

The survey had a 75% response rate. An identical survey was sent to the promotions candidates in order to provide some form of corroboration to the information given by the managers. However the response rate was so low as to preclude any meaningful information from being drawn.

The objective of the pilot study was to see if the records could be used to provide an understanding of the processes of the promotions procedures in relation to their consideration of staff C&IT skills. The intention was to expand the pilot exercise if the results provided some meaningful information regarding the sorts of decisions taken concerning C&IT skills in the promotion process. The fact that it proved so difficult to find the links suggests that any impact C&IT skills have on promotion is likely to be implicit rather than explicit.

An examination of the role of informal 'people networks' at UEA in embedding C&IT skills

UEA is a devolved organisation. To offset the inevitable tendency to fragmentation and to assist information flow and the transfer of good practice, the Staff Development team has established a number of inter-departmental 'people networks'. For example *1-6 Link Up* is open to any member of secretarial and clerical grades 1 to 6. Members meet for social occasions and for work-related activities, and this has proved to be a useful mechanism for building cohesion within that part of the work force. The *1-6 Link Up* network is highly valued by its members, and the generation of the cross-departmental contacts is particularly valued.

One of the work-related activities of *1-6 Link Up* has been the generation of a *Directory of IT Skills*, a well produced booklet financed by a small grant from UEA's Centre for Staff and Educational Development. The *1-6 Link Up* group generated and circulated the Directory amongst its members. It lists the names and contact details of group members who were willing to help and advise others on particular C&IT tasks. The question asked by SCAITS was "Is this booklet an effective contribution to embedding C&IT skills?" Or was the benefit primarily in the task of making it in the first place, which caused a number of people to work together, share skills and get to know each other better?

In early discussion with members of *1-6 Link Up*, various issues relating to the use (or possible abuse) of e-mail as an official communications medium were also raised. Since this seemed to offer a possible barrier to embedding C&IT, it was explored.

Consequently, on behalf of the SCAITS project, volunteer members of *1-6 Link Up* ran relevant surveys amongst members of their group. Given that such work is outside the normal scope of their activities, those involved received training in basic qualitative research and interview techniques, and a final debriefing. They were paid for their work as researchers.

To examine the Skills Directory use, semi-structured interviews were conducted, generally face-to-face but in two instances by telephone and one by e-mail. The guideline questionnaire used by the interviewers is supplied as file *dirq.rtf* on the provided disk.

Reactions to e-mails were determined as follows. Three of the 1-6 team, and the SCAITS Project Officer, each contributed for consideration 20 e-mail messages received on the same date, giving a total sample of 80 messages. At a meeting, copies of the messages received were exchanged within the group and reactions against a predetermined set of questions (see file *emails.rtf* on the provided disk) recorded. These reactions were then collated and analysed by the SCAITS Project Officer.

An investigation into the efficacy of central C&IT staff development and training at UEA

To provide a snapshot of IT training, thirteen IT training courses commencing during October 1999 were selected. These courses were run by UEA's Centre for Staff and Educational Development, and were open to all members of staff.

The research was planned by SCAITS in conjunction with the UEA Survey Office, but the execution and analysis was carried out by the Survey Office alone. SCAITS would otherwise have been involved in investigating courses run by the group to which it was attached. The independence of the research was important, and made clear to course participants.

It was decided to survey course participants on three occasions:

- Questionnaire A was sent approximately one week before the start of the course with a view to recording the expectations of participants, reasons for attendance, current skills (in relation to the particular subject of the course) and other background information.

- Questionnaire B was sent immediately after the last session of the course². This was designed to capture detailed ratings on various aspects of the course.
- Questionnaire C was sent roughly one month after completion of the course. It asked about use of the course topic by respondents during the past month, their assessment of their skills in that subject, and their need for further training.

Other questionnaires were also sent to two further groups:

- Questionnaire D was sent to all those who had booked on the courses but who were unable to attend.
- Questionnaire E was sent to all School Administrators and managers of large units (listed in the UEA phone book).

E-mail and postal reminders (with replacement questionnaires) were sent at fairly frequent intervals. The researcher also made a brief appearance at the start of each course to thank participants for completing the first questionnaire, to ask for further participation and to explain a little more about the project than was contained in the letter accompanying the first questionnaire.

Although very time consuming, this combination of tracking, personal appearances and reminders proved effective in boosting response rates which were a very respectable 91%, 88% and 78% for questionnaires A, B and C respectively. The complete breakdown of responses is shown below.

A respondent from most of the courses was also interviewed by the researcher.

Response rates

	<i>Number</i>	<i>Percent</i>
Completed questionnaires A, B and C	101	79
Completed questionnaires A and B only	12	9
Completed questionnaire A only	4	3
Did not respond at all	12	9
Total	129	100
External participants	3	
Administrative changes	5	
Dropped out prior to start of course	12	
Number initially enrolled for selected courses	149	
Completed questionnaire A	117	91
Completed questionnaire B	113	88
Completed questionnaire C	101	79
Completed questionnaire D (12 mailed)	11	92
Completed questionnaire E (41 mailed)	23	56

²The customary 'course satisfaction' questionnaires were still distributed by tutors at the end of every course, for completion by participants before they left. The research was totally independent of normal procedures.

The questionnaires are given at Annex B, and supplied as files *efficqa.rtf*, *efficqb.rtf* ... *efficqe.rtf* on the provided disk.

This work was again very useful in giving an overview of attitudes about courses, besides giving an insight into the efficacy of the provision and also comment on the courses involved in a way that rarely arises through the usual end of course questionnaire.

A comparative study of approaches to C&IT skills development in different Schools/Units at UEA

This sub-project combined document review and interviews with questionnaire analysis, using data from the project's *Staff C&IT Skills and Use* survey report (UEA, June 1999).

Three communities were examined:

- A science school.
- A humanities school.
- The central computing service.

These three communities involved the 'Skills and Use' survey responses of 120 staff. 38 staff were individually followed up, although their individual responses could not be directly associated with particular survey responses, given that the latter were anonymised.

Policy statements and other literature from each community was considered.

The methodology chosen was deliberately aimed at providing an inductive, evaluative research product which would not be dependent on sampling processes. It did not intend to provide statistically testable quantitative data. Inductive research relies upon personal accounts and cross-referencing of methods and sources to achieve, by triangulation, a high degree of internal consistency. This internal consistency provides a snapshot case study of the subjects and may offer some more general information, but that is not its aim.

The results were useful, despite the difficulty of arranging interviews with staff. Running the sub-project at a quieter time of year would have eased the problem. Although the methodology was chosen deliberately to be independent of sampling, a larger sample of staff for individual follow-up would nevertheless have been advantageous in giving a broader view of each community.

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