

Higher Education Training Needs Analysis

October 2004

Survey for IT & Networking Staff

Introduction

This section of the HETNA survey was designed to cover those staff involved in the design and maintenance of the institutional networks on which all other sectors of staff – and students – increasingly depend. While as much of the common structure which can be observed in other sections of the survey was maintained here to allow for cross referencing between cohorts, there is also a series of specialised questions which relate to the particular activities of this group.

Section A: Your Post

Eighty responses were received from this target group and almost every institution in the sector is represented. As with elsewhere, there is a very high response from the University of Edinburgh - nearly 20% of all responses. The complete return is illustrated in Table 1.

Question 1: Institution

Institution	Responses	Percentage
University of Aberdeen	2	3
University of Abertay Dundee	4	5
Bell College	1	1
University of Dundee	6	8
Edinburgh College of Art	4	5
University of Edinburgh	14	18
Glasgow Caledonian University	7	9
Glasgow School of Art	1	1
University of Glasgow	7	9
Heriot-Watt University	5	6
Napier University	0	0
The Open University in Scotland	1	1
University of Paisley	7	9
Queen Margaret University College	2	3
Robert Gordon University	4	5
Royal Scottish Academy of Music & Drama	0	0
Scottish Agricultural College	2	3
University of St Andrews	4	5
University of Stirling	1	1
University of Strathclyde	4	5
UHI Millennium Institute	1	1
Not specified	3	4
Total	80	100

Table 1: responses from individual institutions

Question 2: Basic facts about respondents

The sample was mostly male as illustrated in Fig 1 and in this respect this group is very different in profile from all of the other cohorts in the HETNA survey.

In looking at the age distribution in this group it is once again untypical of the overall sample. While there is a spread of staff across the age ranges the overall profile here is younger than in other samples, with almost 20% of respondents under thirty years of age. The demographics observable elsewhere in the survey, where there is a bulge towards the higher age range, is effectively reversed here.

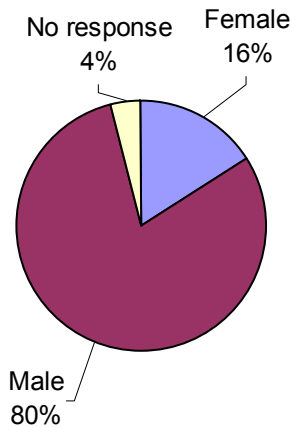


Fig 1: Staff responses by gender (N=80)

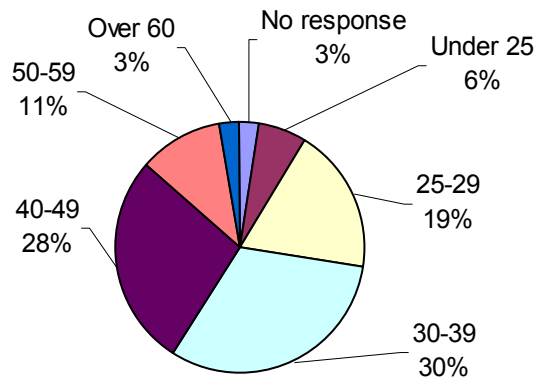


Fig 2: Staff responses by age (N=80)

The vast majority of staff who responded were full-time, permanent employees as can be seen from the charts at Figs 3 and 4.

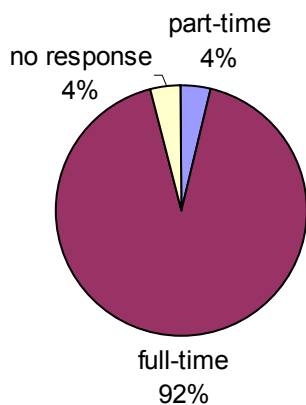


Fig 3: Part-time/full-time jobs (N=80)

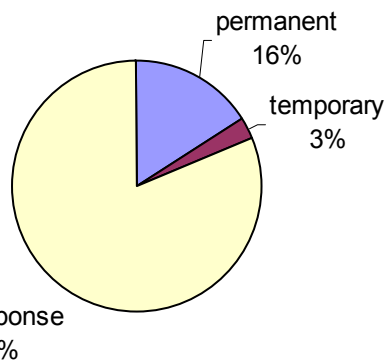


Fig 4: Permanent/temporary (N=80)

Question 3 and 4: Work categories and job titles

Respondents were asked for job title in Question 3, but there was little agreement across institutions on nomenclature. The 80 responses between them shared 51 specific job titles ranging from 'Technician' to 'Faculty Head', the most frequently occurring title in the sample being 'Computing Officer' with twelve instances.

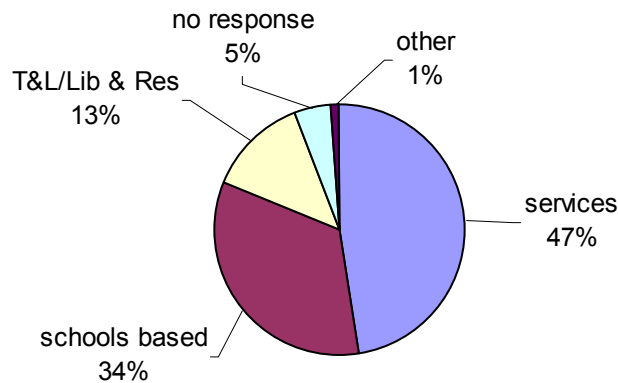


Fig 5: institution-wide or department-specific support (N=80)

Respondents were then asked to identify their home department and the returns for this question are illustrated at Fig 5. There is an interesting split in the responses here between those who described themselves in terms of a 'service' across the institution and those based in a single school or faculty. The split here points to the fact that in some institutions it may be difficult to establish one standard pattern of network provision and support which may vary from department to department. One institution will often support more than one VLE, for example, as different products are supported in different areas.

One other noteworthy factor of this section of the returns is the relatively small number of staff, 13%, who describe themselves as acting in support of 'teaching and learning'.

Question 5: Types of networks

This section of the survey turned to look at the networks which the respondents were supporting. The returns here are illustrated in Fig 6.

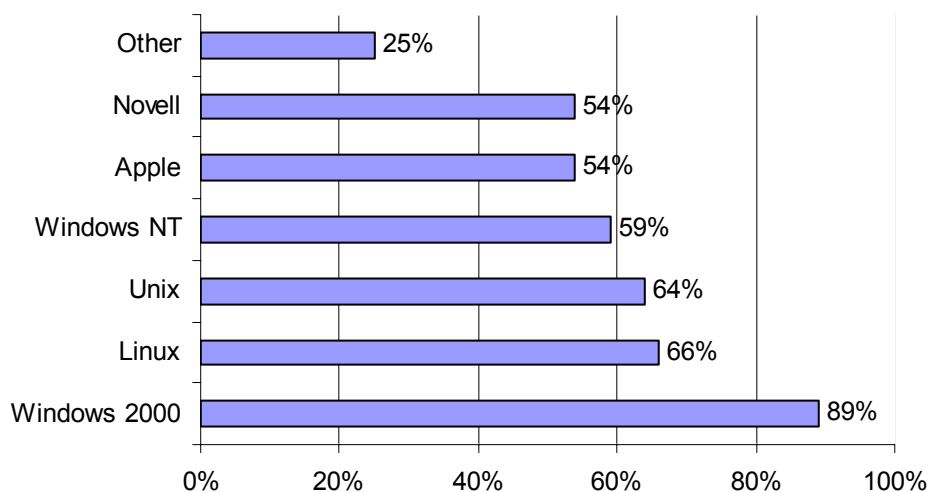


Fig 6: Network platforms supported (N=80)

The first thing to note here is that this question, which invited multiple responses, yielded 328, an average of over 4 responses per institution surveyed, more evidence perhaps of the multiplicity of technologies and standards which exist both across the sector and within individual institutions. While the dominant platform is clearly *Windows 2000*, the open source *Linux* also makes a powerful showing – cited by 66% of all respondents – while *Apple* still retains a foothold in the sector being cited by 54%. Even with the diversity on display here there were still ‘other’ platforms in use. These were probed in an open question which yielded the following responses: Acorn, BSD and other Unix flavours, DOS, Windows 3.1, VAX/VMS, OS/2, SGI, Sun Solaris (twice), with 11 respondents describing further variations of *Windows*.

Question 6: The types of networking equipment in use

HETNA now turned to examine the use of network equipment and once again respondents provided multiple answers. The 165 responses received provide evidence of diversity (though not as markedly as in the area of network platforms) and the chart at Fig 7 illustrates that there were two dominant suppliers in this particular area, Cisco and 3Com who between them were cited in 106 instances. All other suppliers have a far lower and roughly equal share of the market.

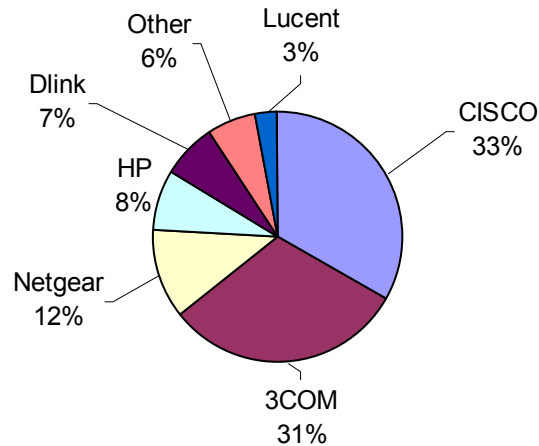


Fig 7: Networking equipment in use (N=80)

Question 7: network technologies in use

Question 7 enquired into the network technologies used across institutions and here there is no doubt that although there is again some evidence of diversity of provision (178 responses were received via the 80 returns recorded) the picture is dominated by Ethernet-based technologies. This is represented in Fig 7 above. Both questions 7 and 8 were followed up with open questions which probed details of the ‘other’ response in both categories. In neither case did any significant information result.

Question 8: the support of network central services

This question looked at how services delivered via the network are supported and principally attempted to identify the level of any outsourcing currently within the sector. Table 2 demonstrates clearly that with, the exception of Net Cabling, only a very small proportion of the sector's total capacity is outsourced, though these blanket figures might mask some uncharacteristically high levels of outsourcing in some individual institutions.

Function	In-house %	Outsourced %
Email	94	1
Web Hosting	93	3
Firewall	89	5
General Admin Systems	88	8
Student Record System	84	9
External DNS	81	8
Net Cabling	73	28

Table 2: The level of outsourcing (N=80)

Question 9: The numbers of computers supported on the network

Question 9 looked at the numbers of devices connected to networks supported by respondents. Of the 80 respondents who completed this version of the survey, more than half (41 individuals) supported networks connected to over 2000 devices. It is possible that the results *may* be skewed because of the number of responses from some of the larger institutions.

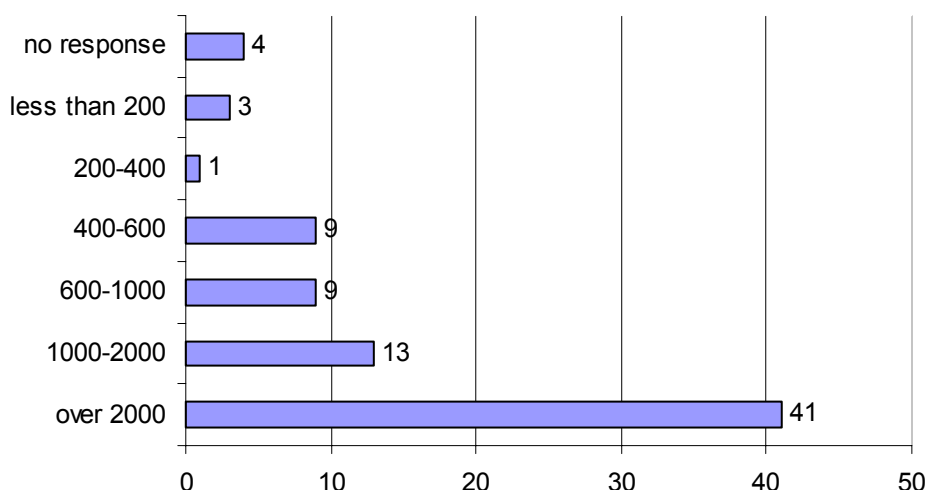


Fig 8: Numbers of computers supported on the network by respondents

Question 10: Virtual Learning Environments

In common with other versions of the survey, two sets of questions were included here to examine the areas of VLE technology and video conferencing. The first set simply asked if the respondent's institution had purchased a VLE. The results are displayed at Fig 9 and, perhaps not surprisingly given this cohort, there seemed a far higher level of awareness here than in other parts of the survey. Perhaps more surprising in this context is that there are still 13% of the cohort who 'don't know'.

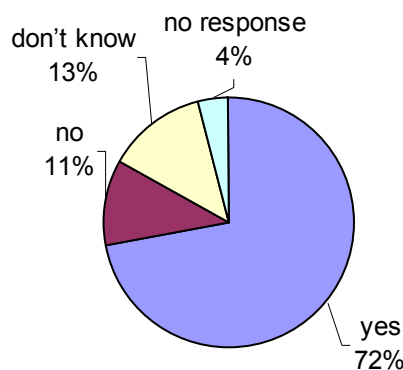


Fig 9: "Does your institution or department have a VLE?" (N=80)

The second set looks in more detail at the VLE products that have been installed and here the pattern is the same as in other parts of the survey (Figure 13). The market is dominated by two major players – *Blackboard* and *WebCT* – who account for nearly 80% of the returns here but there is also increasing evidence of the use of open source VLEs such as Moodle and Boddington, though these still only account for some 7% of the market.

VLE Type	Frequency	Percentage
TopClass	0	0
Boddington	2	3
Lotus Learning Space	0	0
Learnwise	0	0
iCampus	0	0
Moodle	3	4
Blackboard	30	38
WebCT	26	33
Other	7	9
Don't know	3	4
No response	9	11
Total	80	100

Table 3: VLE types installed

Of the seven responses received under the 'other' category a trend observed in other sections of HETNA emerged once again, namely the identification of 'in-house' systems, though the evidence for this was not nearly so strong here as among academic staff. A second supplementary question here probed the uses to which the VLE was put. Only 12 responses were received. Of these 2 used the VLE for administration, 3 for storing and

delivering course information and 4 for storing course materials while only 3 used it for teaching and learning. This area might profitably be explored in more detail as arguably it is not the role of the technical staff to decide on how the technology they support is used but the evidence here points to rather sparing use as yet within one of the core functions of the sector – teaching and learning.

The last question relating to VLEs looked at the level of training which technical staff had received in how to support these systems. Only 5 of the 80 respondents had received any kind of training in this area.

Question 11: Video Conferencing (VC)

As elsewhere across HETNA, use of this technology was selective. As can be seen from Tables 4 to 6, though 80% of the sample had access to a video conferencing suite, only 31% used it sometimes or frequently. Desktop video conferencing, while available to over a quarter of the sample was used sometimes or frequently by 15%. Though the figures show that a majority of this cohort does not frequently use VC, there are indications that network personnel generally have a considerable need to collaborate across institutions. This is a community which feeds on the success of others and regularly shares good practice of a technical nature. In support of this, 30% of respondents, when asked what they used VC for, reported that its most common use was to ‘communicate with colleagues’.

Do you have access to a video conferencing suite?	Yes%	No%	D/K%
	80	7.5	10
How often do you use the video conferencing suite?	Never%	Sometimes%	Frequently%
	51	23	8

Table 4: Access to VC suite (N=80)

Do you have access to desktop video conferencing?	Yes%	No%	d/k%
	26	60	6
How often do you use desktop video conferencing?	Never%	Sometimes%	Frequently%
	30	14	1

Table 5: Access to desktop VC

Do you use VC to communicate with colleagues?	Yes%	No%
	30	44

Table 6: Use made of VC (N=80)

Finally the sample was asked for any other uses of for video conferencing, but among the 10 responses received, no consensus emerged and no dominant trend was discernible.

Question 12: Professional Qualifications

A set of questions was designed to review the professional qualifications held by IT & Networking staff and the detailed results are as shown in Table 7.

	Yes	Working Towards	Not Relevant	Never heard of it	No Response	Total
Microsoft						
MCP	6	15	16	4	39	80
MCSA/MCSE	6	18	18	4	34	80
Novell						
CNA	6	7	28	0	39	80
CNE/MCNE	5	5	29	5	36	80
CISCO						
CCNA/CCDA	5	7	28	6	34	80
CCNP/CCPD	1	7	27	7	38	80
ECDL						
ECDL	5	2	33	6	34	80
ECDL (advanced)	0	1	28	8	43	80

Table 7: Professional Qualifications Held (responses)

Recalling the earlier data collected on network platforms and equipment (Questions 5 and 6), it should be no surprise that the most popular options here are for training in Microsoft and Novell systems. However, it is also interesting, and rather puzzling that the numbers who reject both qualifications as 'not relevant' is so high. Not surprisingly, the generalist and application-based ECDL finds favour with very few respondents to the survey.

In the final analysis, it may be observed that the following percentages of the survey population either have already, or are working towards, the following IT qualifications:

- Microsoft: 26% for MCP; 30% for MCSA/MCSE
- Novell: 16% for CNA, 12.5% for CNE/MCNE
- CISCO: 15% for CCNA/CCDA, 10% for CCNP/CCPD
- ECDL: 8.7% for standard ECDL, 1% for ECDL advanced

Although Novell and CISCO are also important, it is clear that *Microsoft*-related training is the most relevant and valued by respondents.

Section B: Using Computers in your Work

Question 13: Access to equipment

In common with other varieties of the survey the next set of questions examined individual access to computer hardware and respondents' perceptions of whether the existing installed base was sufficient to the demands of their roles. The response here was typical of that seen across the spectrum of HETNA responses. The ratio of computers to personnel here is even higher at 1:1 though a fifth of those surveyed felt that the existing technology was inhibiting their ability to work effectively.

Do you...	Yes%	No%
...have exclusive use of a computer (or workstation) at work?	99	0
...share a computer with others?	23	71
...feel that your capabilities are limited by the power of your computer?	18	78
...feel confident using computers in your work?	98	0

Table 8: Access to equipment (N=80)

Question 14: Diagnosing problems/systems development

A variation on this pattern looked at the uses of the equipment directly in relation to the role of networking staff where clearly the vast majority have specialised access for both diagnostic and developmental purposes (Table 9). The only deficiency appears in the area of network development facilities where 45% of the sample felt that testing facilities could be improved.

Do you have access to computers for...	Yes%	No%
...simulating user/network problems	70	28
...systems development testing?	73	23
Are these computers in addition to your 'office' workstation?	66	25
Do you feel your testing facilities are sufficient for...	Yes%	No%
...most diagnostic purposes?	66	28
...most network development processes?	49	45

Table 9: Access to specialised computing technology (N=80)

Question 15: Using computers for work

The next set of questions which analysed use made of the technology revealed another pattern familiar across the HETNA survey. This is the universal tool for location of resources and for all peer communication. Not surprisingly also in this context, the vast majority of those surveyed used computers to manage the networks they supported.

In the work context, computers are used....	Yes %	No %
...to find information or resources?	99	0
...to communicate with colleagues?	99	0
...to remotely administer systems?	89	10
...to plan or manage a network?	75	23

Table 10: Use made of computers (N=80)

The closing question in this section then probed 'other' uses of the technology but yielded few surprises, with many of the answers merely paraphrasing the wording of the components of Question 15. A small number did state, in an answer which echoed others from across the survey, that the computer was used across 'all aspects of work'.

Section C: Staff Development and Support Needs

Question 16: the sort of training felt to most benefit respondents' work

The staff development needs of this particular cohort tend to be sometimes very specific and may be tied to the particular technical demands of a specific piece of proprietary hardware or software. The next set of questions therefore sets out to explore this particular aspect of training among technical and networking staff.

In the first section of the table at Table 11, it is no surprise that once again the training demands map across to the findings on network platforms and equipment examined earlier. Thus Microsoft XP training dominates the demand here being perceived as the next generation of software towards which many existing systems will shortly migrate. Equally to be expected was the demand for Linux training given the increasing popularity of Linux-based

systems demonstrated earlier and the continuing demand for Apple support. A similar pattern can be observed in the second section of the table where once again Windows and Linux training are both in high demand.

In the third part of this table, which has been sorted on the basis of positive returns, then the highest demand is for training in aspects of wireless networking, a technology which is now beginning to mature and is seen as having increasing application across the HE sector. This is followed by network security and firewalls both essential to the uninterrupted running of the network in a context where networks are continually vulnerable to disruption as a result of unauthorised intrusion. This is a continually evolving and crucial area of network maintenance and the figures here merely echo those found in other sectors.

Network design and the efficient configuration and maintenance of routers have been staples of technical training in this area for a number of years and form the core of the training supplied on behalf of the JISC by UKERNA.

It is perhaps an index of how poorly perceived video conferencing has become that demand for training in this area only appears at the end of the list and trails demand for all other needs by a considerable margin. On the other hand, given this group's professional area, it could be that they already know how to use VC, such that if any training were required it would be they who would be giving it. In this case, the group would be unlikely to request training in a subject with which they were already well conversant.

Customer care attracts similarly meagre support in the final section.

Type of training	Yes %	No %	N/R %	DKWII % *	N/R %
Desktop Support					
XP	59	28	4	0	10
W2K	33	40	20	0	20
UNIX/LINUX	56	20	15	0	15
Apple	30	30	21	0	21
Networked Server Support					
Windows	65	15	14	0	14
UNIX/LINUX	65	9	18	0	18
Novell	35	23	25	0	25
Network Technology Support					
Wireless networking technology	80	9	5	0	5
Network security	79	8	8	0	8
Firewalls	69	14	8	0	8
LAN/WAN Design	59	14	11	0	11
Antivirus	55	23	16	0	16
Router configuration	53	9	13	0	13
Router maintenance	46	11	15	0	15
Videoconferencing technical support	31	24	20	0	20
Other					
Customer care	36	36	21	1	21

Table 11: "What sort of training would most benefit your work?"

* DKWII = don't know what it is / N/R = no response

A follow-up question to this section enquired after the need for further training not so far mentioned. Seventeen comments were received and no particular picture emerges other than the fact that the comments are split between technical demands, where no pattern is discernible, and a demand for more generic 'management' skills. Staff, strategic and risk management skills all attract single requests but project management is the most commonly mentioned with three citations.

Questions 17 and 18: vendor-certified courses

The next two questions examined attitudes towards vendor certification and examinations. This once again ties in with the use of specific platforms or software products and has the advantage of being a transferable qualification valued outside the educational context. As can be seen from Fig 10, two thirds of those who responded to this question felt that such certification was 'important' with the bulk of respondents also feeling that completing the exams which accompany vendor training courses was 'fairly' or 'very' important (Fig 11).

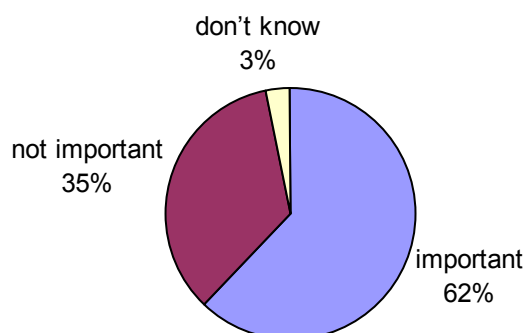


Fig 10: the importance of vendor certification (N=80)

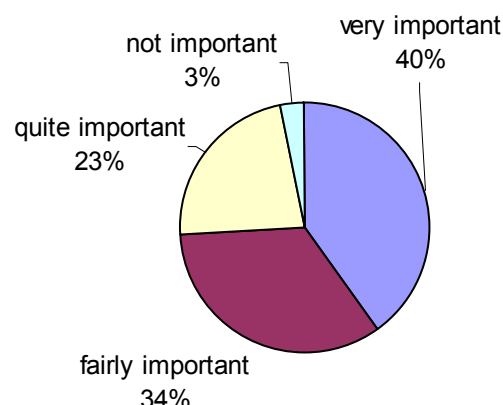


Fig 11: Completing vendor examinations (N=80)

Question 19: Methods of training and support found to be most suitable

The last set of questions is common to all varieties of HETNA and considers the preferred mode of delivery of staff development. Among this cohort the 'blended' model attracts the highest level of support by a considerable margin while only 6% of those surveyed would reject this delivery method. In beating traditional methods into second place this cohort is again representing a trend discernible across the survey, but more marked in this instance – a willingness to accept alternative forms of staff development delivery, particularly in the blended model. On the available evidence we can only speculate as to the reason for this but perhaps the relatively youthful age profile of this set of respondents is related to the more flexible attitude to forms of delivery other than face-to-face. This particular staff cohort, by nature of the jobs they do, is also more likely to be highly technically competent, to use e-communications a lot, and to collaborate remotely with colleagues on a regular basis.

Methods of training	Yes %	No %	N/R %
Traditional face-to-face workshops/courses	78	9	14
Advice by phone, electronic mail or through electronic discussion lists	46	33	21
A 'blended' model (face-to-face workshops & open/flex learning supported online)	85	6	9
Open and flexible learning delivered and supported wholly online.	49	29	23

* N/R - No response

Table 12: Methods of training found suitable (N=80)

Question 20: Factors influencing/restricting preferences with respect to training models offered

The barriers/inducements to training examined in this question attracted 39 comments which echoed themes mostly familiar from other parts of the survey. As elsewhere, the biggest barrier to the uptake of staff development is 'time' - cited by 15 of the 39 respondents. However, the question of 'cost', barely mentioned elsewhere across the surveys, does figure significantly here, being identified as a barrier by 20% of all those who responded. This may be due to the relatively specialised nature and therefore high cost of training for technical staff. Also, despite the data recorded in question 19, seven respondents here expressed a preference for face-to-face delivery as suited to their circumstances and personal learning styles.

Question 21: Other training needs related to ICT and the use of e-learning

The final survey question invited respondents to request training not already listed in other parts of the survey. The twelve responses received fall into no particular pattern but there is one comment which seems to sum up a more imprecise demand for training, or rather information, which might be important in the context of staff development.

'As a team manager, I need to know about new technologies and systems, such as new network technologies and VLEs in order to plan future network developments for my institution.'

There is a need for all staff to be aware of the strategic objectives of the institution and to define their training needs in the context of it.

Conclusions

1. Almost every institution is represented in this cohort. Edinburgh University has the highest response rate at 17.5%.
2. This cohort differed from all others in having a younger demographic distribution.
3. The majority of staff who responded were full-time, permanent employees. 80% of whom were male. This contrasts with other cohorts in the HETNA survey.
4. Windows 2000 is the most widely used networked platform in the sector. However, an average of four responses per institution suggests that there is a multiplicity of platforms in use. Linux, Unix, Windows NT, Apple and Novell are also well represented.
5. Cisco and 3Com are the most widely used networking equipment in the sector.
6. Network central services like email and webhosting are mainly supported in-house. In contrast, 28 percent of respondents indicated that network cabling was outsourced.
7. VLE technology
 - 72% of respondents were aware that their institution had purchased a VLE, the highest percentage across all cohorts.
 - Blackboard and WebCT account for the majority of returns. A small number of open source VLEs such as Boddington and Moodle are in use.
 - Just over 6 percent of staff have received VLE training.
8. Video conferencing is used by just under a third of this cohort either sometimes or frequently.
9. Computers at work
 - 99% of respondents have exclusive access to the use of a computer. However four out of five are satisfied with the computing power available to them.
 - 45% of respondents indicated that they do not have testing facilities that are sufficient for network development processes.
10. Staff Development

Staff development in all the main platforms of desktop support and networked server support has been indicated.

From network technology support, the three key areas of interest were

- Wireless networking technology
- Network security
- Firewalls

A 'blended' model of training was the most favoured type of delivery for this cohort closely followed by a traditional face-to-face model. This inverts the pattern seen in all other sections of the survey and may reflect the varying age distribution pattern here.