Education Departments' Superhighways Initiative

Group C: Teachers' Professional Development

Final Report

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2.   THE TEACHERS MANAGING LEARNING PROJECT

Description of the project

2.1   The Teachers Managing Learning (TML) project was a joint initiative in Cambridgeshire from the County Department of Information Technology, Cambridgeshire Curriculum Agency for IT in Education (CITE) and the Schools Library Service and Education Information Technology Services (EdIT). These agencies have provided between them the technical and curriculum expertise necessary to implement the project within the County. TML complements two other initiatives currently running across the County. These are the Internet for Schools initiative, which has now achieved its objective to have all County schools on line by 1997, and a Bulletin Board that facilitates direct communication between schools and County Administration. In a policy statement known as the LEA New Agenda, the County's mission statements relating to education and telecommunications have been clearly described. The three telecommunications-based projects mentioned here are in direct accord with that policy statement.

2.2   The project as originally proposed consisted of two phases. Phase 1 of the project involved providing every primary, secondary and special school in the County with the opportunity to send two staff to a half-day 'awareness' training session. These were offered without charge to the school, although any costs relating to necessary staff cover had to be met from the existing school budget.

2.3   This was to be followed by Phase 2, in which schools where staff had been inspired by the ideas they were exposed to during Phase 1 were invited to buy in assistance from the LEA support staff to initiate some kind of curriculum-based development project using Information and Communications Technology (ICT) in their teaching.

TML Phase 1

2.4   Fifty-eight sessions were run during the Summer and Autumn terms of 1997. The sessions were carefully designed to provide context to the experience of the related technology. The video-conferencing activity was built around the need to interrogate colleagues attending a parallel course at another site and assess their suitability to represent the County at a fictitious international conference. Data sheets on each participant were exchanged via fax prior to the video conference. After questioning all the attendees at the other site, and being questioned themselves, the two groups then wrote a letter to the chief executive nominating the representatives and justifying the choices. This was done using the document-sharing feature of the video-conferencing software.

2.5   After logging off from the other group, some presenters also took the opportunity to show the participants the view from a number of remote cameras, including some outside the UK and those which have an interactive function, for example the ability to swivel the camera.

2.6   The course participants were not given any hands-on experience of operating the video-conferencing software. They were passive users of the system, sitting in front of the cameras and conversing with colleagues at the remote site, or operating the word-processing software during the application sharing. The software was operated on all occasions by the session leader.

2.7   Following an overview of the Internet, including its origins, structure, address protocols and relationship to the WWW, the final session gave teachers access to

the WWW, starting with a number of bookmarked sites with information relevant to the National Curriculum. Topics included Volcanoes and Judaism.

TML Phase 2

2.8   In Phase 2 of the project, there was an expectation that some teachers attending Phase 1 sessions would accept the invitation to take things a stage further, and seek support from LEA agency staff to do so. They were offered the opportunity to have some County support to implement WWW and/or video conferencing via an ISDN link in their school. Because this phase relied on investment from schools from existing budgets, since the County holds no funds to fully support these activities, it was necessary for the County agencies to be reactive rather than prescriptive.

2.9   A programme of activities relating to Phase 2 was circulated to all schools in the County. There were no respondents to the invitation for the Autumn term, so the programme was repeated in the Spring term.

Sponsors and other parties involved

2.10   Funding for the video-conferencing hardware and ISDN2 lines for the six proposed project sites has mostly been provided by the County Agencies, and also by industrial sponsors, chiefly BT. The INSET offered in the awareness sessions was provided without charge to the schools. Given that all the educational support services involved are required to generate revenue, it is hoped that this exercise will eventually generate interest from schools who will then buy in further training and services from the agencies. Whether or not the schools have adequate budgets for this, or regard telecommunications as a sufficiently high priority for spending, are issues that this evaluation addresses.

Hardware and software used

2.11   The original proposal was to install video-conferencing facilities at six sites. Three of these would be the County teachers centres at Godmanchester, Waterbeach and Peterborough. These sites each now have two ISDN2 lines funded by the Cambridgeshire County Council through the Department of IT, not the education service. This is part of a larger project to link County administrative sites using ISDN.

2.12   Each site also has a Pentium P100 system, funded by EdIT. BT Education have funded three base VC8000 systems with the echo-cancellation units provided by Interactive Media. The remaining three sites were to be schools, selected to reflect the geographic and sociological mix of the County. So far, only one school has been identified.

External connectivity

2.13   ISDN2 connections for Internet provision and video conferencing were available at the training centres. The County Bulletin Board project has provided a modem for an administration PC in every school in the County. The service provider is the County IT service who do not currently charge schools, and if schools use the relevant cable service provider for their telephone service, available to the urban and some of the rural schools in the County, calls to the County server are free. Since the service supports full Internet and WWW access as well as the administrative Bulletin Board access, Cambridgeshire schools with access to the local cable providers, Cambridge Cable, currently have the opportunity to arrange free access to e-mail and information services.

Data relating to schools and staff attending staff development

2.14   The objective of the first phase of the project was to touch every school in the County and raise the general level of awareness of ICT across the board. Data was collected from the 170 schools that sent representatives to the staff development sessions. All 310 of the LEA's schools were invited.

Table 1. Attendance at workshops

	Number of schools returning the questionnaire	Number sending headteachers	Number sending one or more IT specialists
Infant	15	11	9
Primary	137	96*	73
Secondary	15	7	11
Special, including Pupil Referral Units (PRUs)	3	1	-

*Including acting headteacher.

Three primary schools sent members of their senior management team, and one primary governor attended.

2.15   About three-quarters of primary and infant schools sent headteachers, compared to 40% of secondaries. Fifty-five per cent of primary and infant schools sent IT specialists, compared to 78% of the secondary schools. Seven heads of primary schools were also IT specialists, and of the 20 primary deputy heads attending five were IT specialists. Some primary IT specialists were new to their role and only just coming to grips with the subject, as can be seen from the answers to *Amount of new information* later in this report (see paragraph 2.37). Secondary school IT specialists were more confident.

2.16   The different distribution of attendance reflects the size difference of primary (mean = 212 pupils), and secondary schools (mean = 853 pupils). The larger schools were more likely to send specialists or senior managers to workshops. Overall, the turnout of senior managers was perceived as very good by LEA staff, and a reflection of the priority that schools attach to these new technologies.

Evaluation

Project initiation

2.17   On 25 January 1996, the project team ran an introductory workshop for invited, IT-aware teachers and advisory staff, at which they ascertained the perceived needs of the County's teachers for training and information relating to telecommunications and superhighways. This event involved a trial run of the format of the awareness-raising half-day sessions that the LEA team had already devised for Phase 1 of TML. It began with an introduction to the Internet, including a brief history and associated terminology, from a member of EdIT. This was followed by an introduction to video conferencing with a demonstration of the VC8000-based

system running over an ISDN2 link. This session was run by the IT division of CITE. Finally, the head of the Schools Library Service gave an on-line tour of a selection of WWW sites relevant to the topic of Volcanoes.

2.18   An active debate resulted from these sessions, which contributed to the fine tuning of the programme for the actual awareness training. A particularly important issue to arise was the teachers' perceptions of what on-line media can offer. Simply presenting such resources as alternatives to print or off-line multimedia was unsuccessful. Rather, it became clear that it is essential to emphasise the capacity for extension and enhancement of the curriculum that these sources offer. For example, basic information on volcanoes can be gleaned from print and/or optical storage media. Teachers present regarded accessing such information from on-line sources as disappointing, due to the technical limitations of intermediate band technologies and a scarcity of directly relevant data; this despite viewing only previously selected sites identified by the Schools Library Service. However, having used alternative sources, the concept that pupils can then go on line to get up-to-the-minute information on current seismological events was met with more enthusiasm. It is this type of application of information highways that enlivens the curriculum and inspires pupils and teachers alike. The experience of this session showed clearly that even IT-aware teachers, such as those specially invited to that introductory session, may not necessarily appreciate the possibilities of ICT from simple exposure to the raw media.

Initial training

2.19   Following four further planning meetings, a programme of 58 sessions, run in pairs on 29 dates at two sites simultaneously, were planned. The first of these took place on 9 May 1996, and the last on 14 November. The delay between the first planning session and the first course was largely due to the time needed to communicate with all schools, and to allow sufficient notice to ensure good levels of attendance. Each school was allocated a date on which to attend. Schools that had responded more speedily to the other County ICT initiatives were invited to the earlier sessions. These schools were assumed to have reached a state of 'ICT-readiness' and therefore be more likely to opt into Phase 2.

2.20   Each course took place at two teachers' centres in the County simultaneously, to allow a video-conferencing session to occur between the two groups. Three sites were used in all, at Godmanchester, Peterborough and Waterbeach. All teachers attending these courses were questionnaired by the evaluators in accordance with the original evaluation proposal. This data-collection exercise has given a view of the schools' attitudes to the implementation of intermediate and broadband technology, and its likely relevance in their schools over the next 5 years. It has also allowed the evaluators to contrast these to the level of use of, and expenditure on, IT generally at the present time. One-hundred and seventy school responses have been processed and analysed. An evaluator attended a number of sessions, at least one at each site.

Technical and educational training

2.21   Prior to the sessions, the LEA support staff leading the training themselves needed to become familiar with the ICT and resources they would be using. This was especially so in the case of staff from the Schools Library Service, who did not necessarily have daily contact with ICT. Additionally, the VC systems proved sufficiently temperamental that all session leaders usually required the presence of a technical-support assistant for each session. This had the result of making the sessions extremely expensive for the LEA to staff.

Obtaining and installing equipment

2.22   Six VC8000 systems were acquired for this project. Three were installed in the teachers centres used for the training sessions in Phase 1. Originally, it was intended that the other three would be made available to schools in the County, ideally in rural and urban contexts, for work in Phase 2. At the time of writing, only one of these is *in situ*, in a rural primary school. This school already had an ISDN link, and a well-developed policy of using resources of all kinds outside the school, including the use of technology such as faxing. The low availability of ISDN access and the cost of the investment have inhibited uptake by other schools. It seems that schools were unwilling to invest in ISDN for video conferencing, particularly when they had no prospect of retaining the LEA-owned equipment or investing in their own.

2.23   The installation of the equipment in the three teachers' centres was reasonably event free. It is interesting to note, however, that the software chosen during an independent evaluation was in the end substituted with an application regarded as somewhat inferior. This substitution was a result of subsequent donation of the software.

Data speed

2.24   The video conferencing using ISDN2 was generally regarded favourably by the participants. Pairs of teachers took turns to sit in front of the terminal and communicate with up to 10 colleagues at the remote location. Despite the highly pixelated video images, and the time lag effect created by the slow refresh rate, no adverse comments were received. This may be due to the fact that the images were also relayed on large high-definition TV monitors to aid visibility to the larger group. The quality of sound transmission was also poor, with much repetition of messages needed and perceptible delays. However, no one individual experienced the system for more than 5 minutes continuously, and the information exchange was light-hearted in nature. This contrasts with the experiences of teachers using the system for longer and with more earnest intent in the CLASS project (see Report C2.1), who consequently found the limitations of a similar set-up tiring and frustrating.

2.25   The experience of using the Internet over a Local Area Network (LAN) with an ISDN2 connection was seen as slow. Support staff who had previously struggled with modem-based systems appreciated the improvement in reaction speeds, but new users more familiar with accessing data from disk or CD-ROM found it slow. This is, of course, particularly so where sites with graphics are involved.

Video conferencing

2.26   Teachers with previous experience of Windows-based software had little difficulty in operating the shared word processing application during the VC document-sharing exercise. It is interesting to note that even the experienced IT support staff in the project team required the presence of a technical expert to ensure the video conferencing itself ran smoothly. Additionally, the presenters arrived much earlier for sessions than would be the case with courses where they felt confident of the technology. These factors have had a direct impact on the cost of the courses to the collaborating agencies, as the staffing demands are higher than originally envisaged. The level of confidence in the system did not seem to improve over the course of the two terms, even though the video conferencing only once failed entirely when a thunder storm disrupted operation of the ISDN lines.

2.27   The image quality during these sessions proved adequate, with the local image always at higher resolution than the remote, as would be expected. The images were

displayed on a large, high quality television at each site, which ensured a clearer view for group members than a standard monitor. No teachers complained of poor image quality in the sessions attended by the evaluator, neither did they complain about the poor audio quality, even though it was frequently necessary for exchanges to be repeated before they were understood, and participants had to raise their voices. The total time for which any one person used the facility was rarely more than a few minutes, which may explain the lack of dissatisfaction and fatigue as experienced by the CLASS project members.

Internet browsing

2.28   In the sessions observed by evaluators, even IT-literate teachers needed some help from support staff to operate Internet browser software. In particular, the operation of searches was poorly understood. This suggested a lack of familiarity with basic database handling in many cases.

Meeting the aims

2.29   The main aims of TML were to:

- provide Cambridgeshire teachers with experience of broadband technology

- produce better informed teachers

- provide suitably equipped centres with experienced training and support staff

- produce curriculum materials that exploit broadband technologies.

2.30   The data provided in this report show that the project achieved the first three of these, but has yet to accomplish the fourth. This would have been the objective of Phase 2 of the project, which has yet to begin.

2.31   Two members of staff, often at management level (see paragraph 2.15), from some 170 schools in the County have now received some experience of ICT through a half-day session with hands-on opportunities. This is over half of the County's 310 schools. Moreover, some of the schools that did not attend the sessions are already active users. In fact, all schools that chose not to attend Phase 1 are using the Bulletin Board, if only for administration, and seven are using it for WWW access. There is no access to data for schools that are using other service providers for Internet access, but there are definitely some known to the County. It is therefore reasonable to assume that a high proportion of non-attendees were beyond the point at which awareness-raising training was useful to them. Others may not have been able to attend on the set dates or may not see ICT as a current priority.

2.32   Those who did attend the training sessions responded very positively to them. The analysis of the questionnaire collected after sessions follows, with results presented in tabular or graphical form. In *Table 2. Reasons for attendance*, the two groups of data for infant and primary schools are presented separately, as Group 1 (Summer term) and Group 2 (Autumn term). This is to establish that the primary schools attending in the summer term were indeed those already specifically interested in superhighways, as the LEA had identified. Elsewhere, the groups are merged unless there is a significant difference between them.

Table 2. Reasons for attendance

School	General interest	Specific interest
Infant (Group 1)	3 (100%)	1(33%)
Infant (Group 2)	12 (100%)	0
Primary (Group 1)	47 (63.5%)	19 (26%)
Primary (Group 2)	57 (90%)	3 (5%)
Secondary	9 (60%)	8 (53%)
Special, including PRUs	1	2

2.33   The school representatives were asked why they attended the workshops; whether their interest was general or specific. Most of the infant schools in both groups attended through general interest, although one school had some specific interest also. The secondary schools were divided equally between general and specific interest. The primary schools showed a difference between the two groups. While more schools were more likely to attend from general interest, in the second group 26% of the schools attended for a specific interest compared to 5% in Group 1. This would be expected if more 'ICT-ready' schools attended the Group 1 workshops, as LEA staff anticipated. Results are shown in Figure 1 (below) and Table 2 (above).
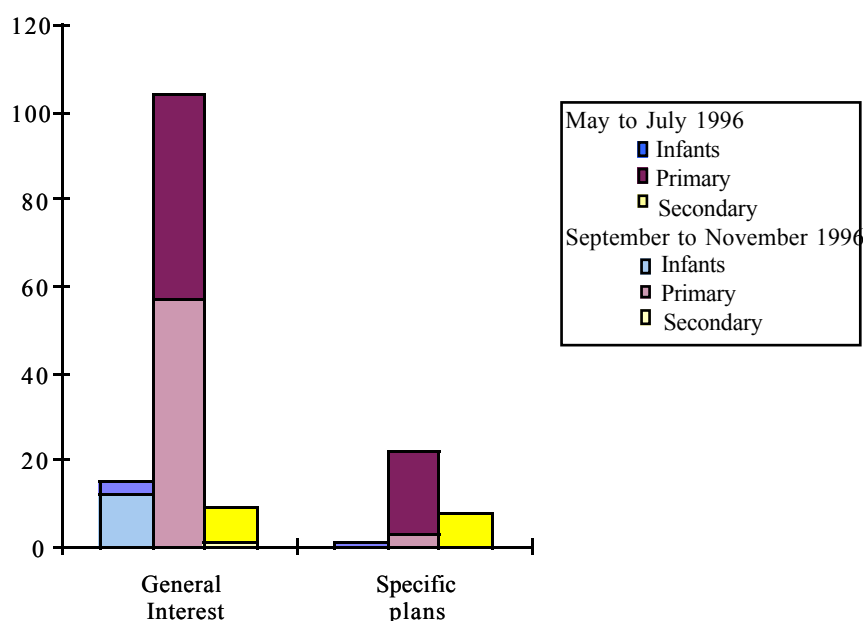
Figure 1. Reasons for attendance

Sessions

2.34   Schools were asked to report back separately on each of the sessions, Video Conferencing, Highways and Superhighways (the general presentation) and Exploring the Internet.

Relevance of training sessions to the school

2.35   The participating teachers were asked if the information in the sessions would be relevant to their schools in the next 5 years. Results are shown in Table 3.

Table 3. Relevance to school

School	Video conferencing	General presentation	Internet resources
Infant (Group 1)	3 (100%)	2 (67%)	2 (67%)
Infant (Group 2)	6 (50%)	6 (50%)	7 (58%)
Primary (Group 1)	45 (61%)	56 (78%)	67 (90%)
Primary (Group 2)	33 (52%)	37 (59%)	47 (75%)
Secondary	13 (87%)	14 (93%)	15 (93%)
Special, including PRUs	2	2	2

2.36   Half or more of the schools in all groups felt that all of the sessions would be relevant to their schools. Infant and primaries in Group 2 were least certain of the relevance. The secondary schools felt that all three sessions were relevant (over 80% schools); Group 1 primaries also felt that the general presentation and Internet resources were very relevant.

Evaluation of sessions

2.37   Schools were asked to rate each of the sessions on two counts; the amount of new information (rated in five steps from none to all) and value to the school (rated in five steps from none to very useful). Results are reported in two groups (Group 1 attending May–July and Group 2 September–November). Results can be seen in Figures 2 to 4. All groups rated highly the amount of new information, with Internet resources judged of highest relevance to schools and video conferencing lowest (but still relevant). Secondary schools were slightly more aware of the information content than primary schools. The fact that the majority of attending teachers found the session informative and valuable shows that the LEA achieved its objective of better informed teachers. It is unlikely that this degree of satisfaction could have been achieved if the sessions had not been held at well-equipped centres and run by well-trained staff.

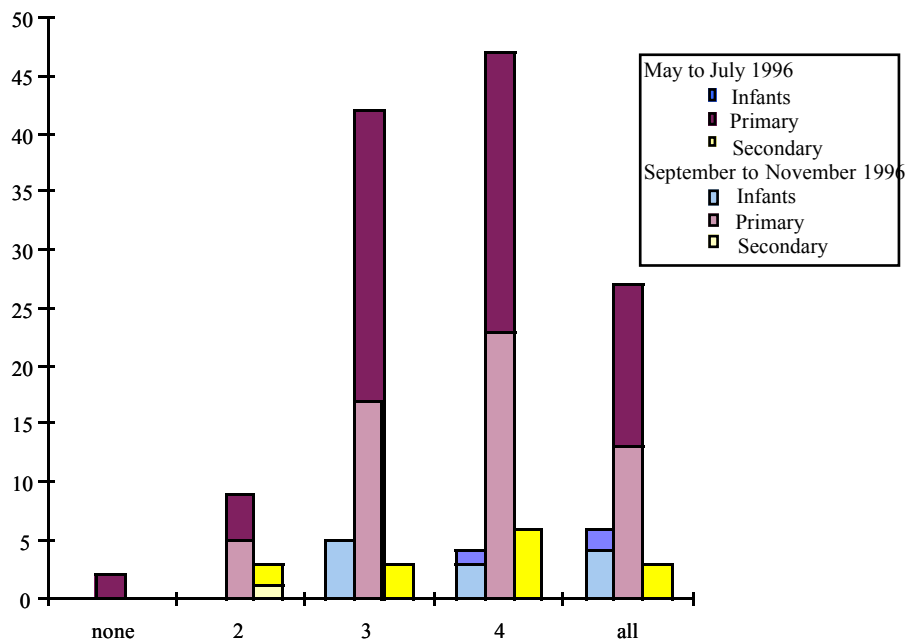*Figure 2. General presentation session*
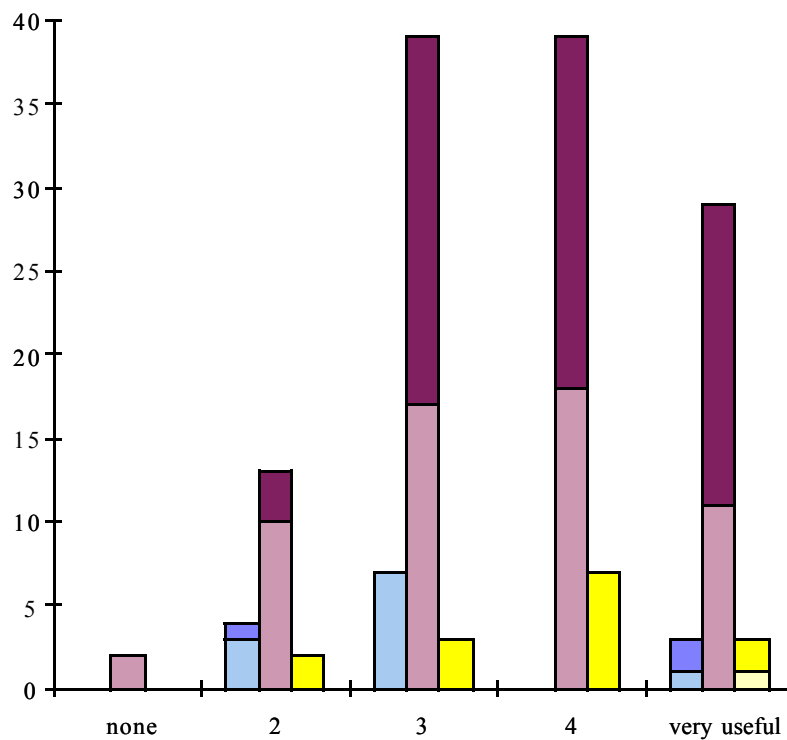

Figure 2a. New information

Figure 2b. Value to school of the general presentation session

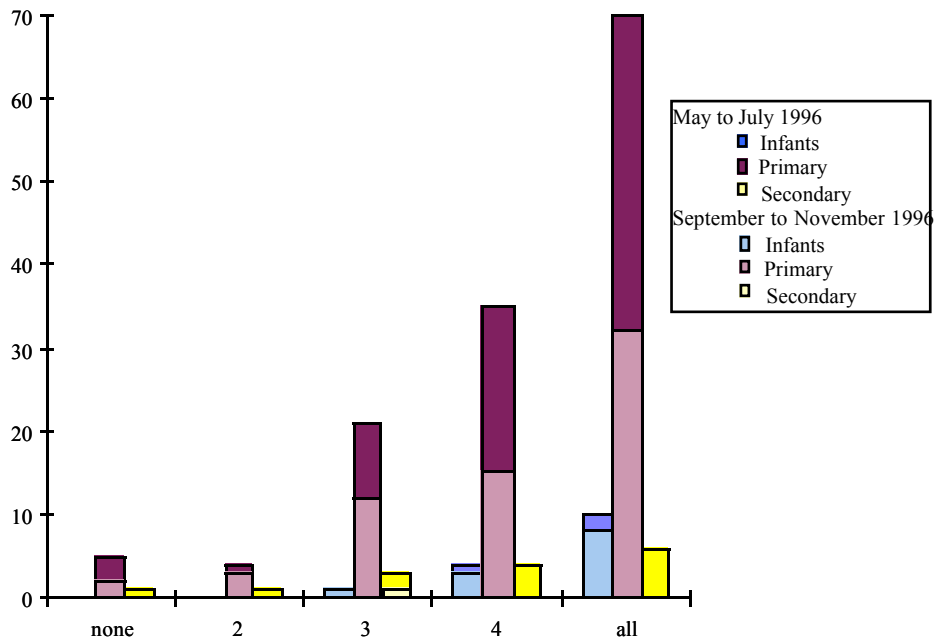*Figure 3. Video-conferencing session*

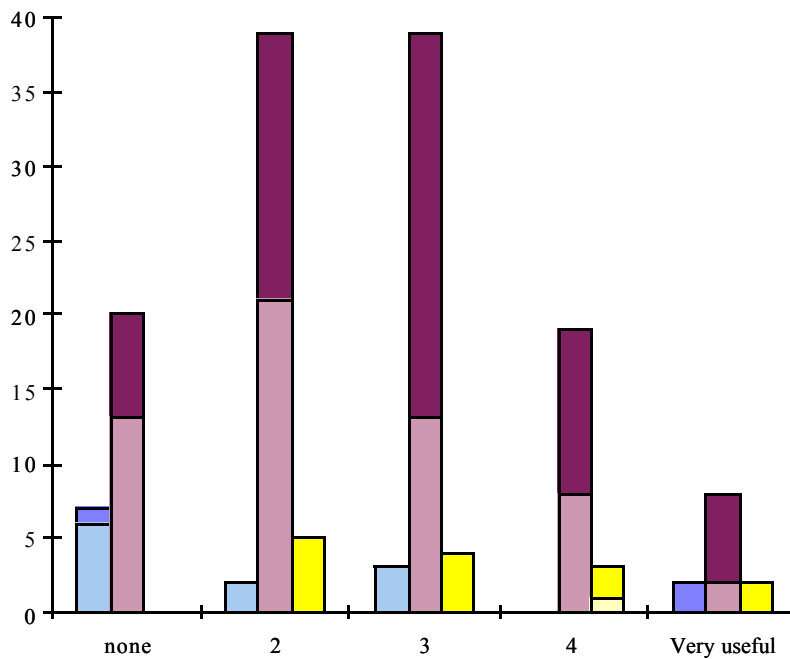*Figure 3a. New information*

Figure 3b. Value to school of the video-conferencing session
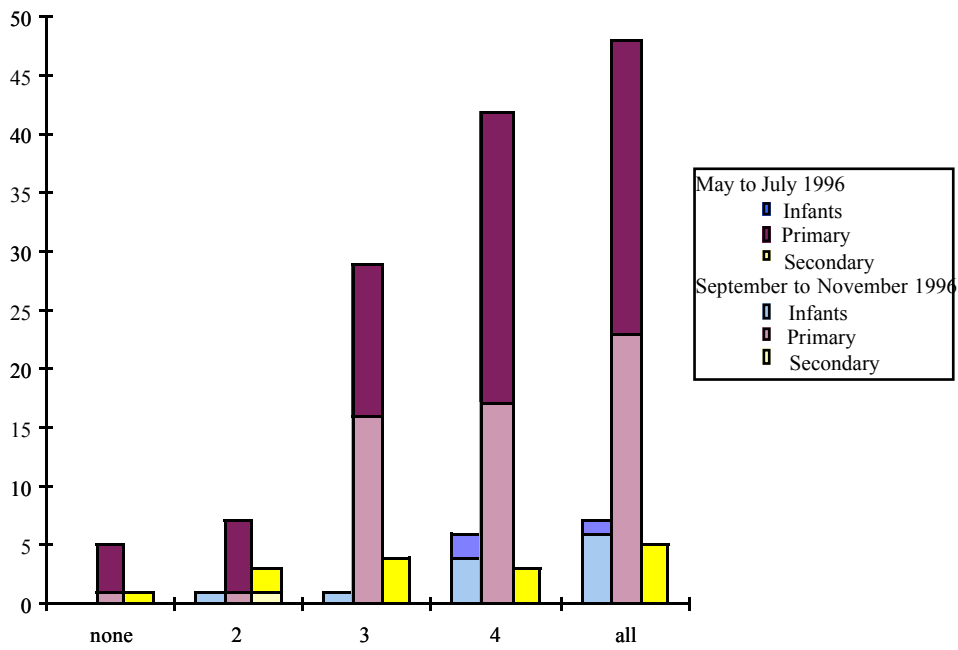
Figure 4. Internet resources session
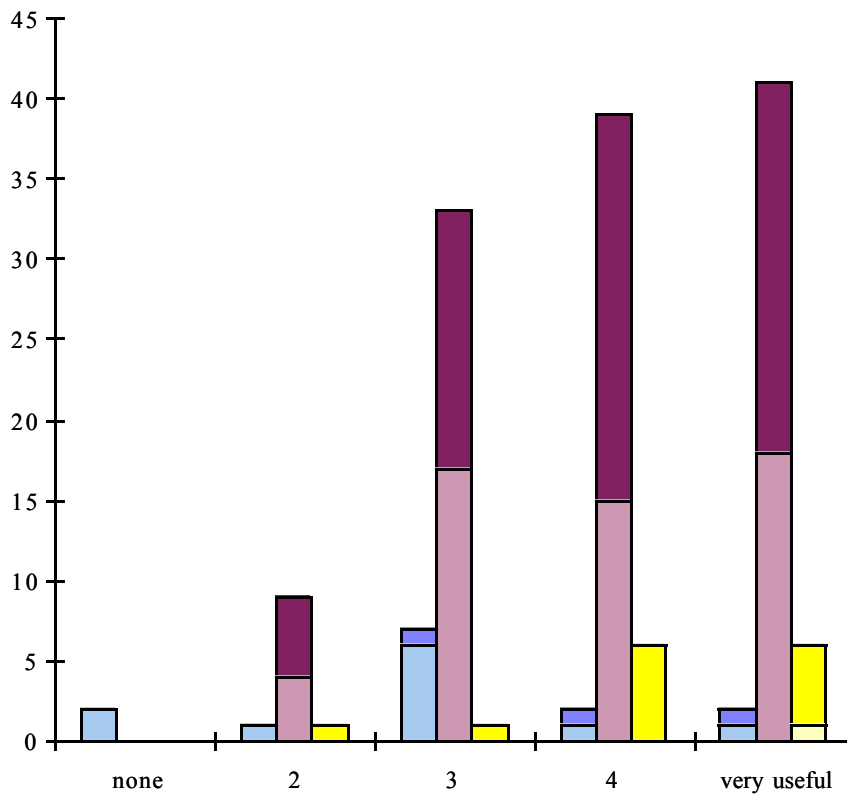

Figure 4a. New information

Figure 4b. Value to school of the Internet resources session

The current situation

2.38   The schools were asked about current use of IT, and current budget commitments for the coming year. They were also asked if they would be likely to get involved in Phase 2, and if so what they would like to do.

Table 4. The current situation

	Infant	Primary	Secondary
Total spend on IT	938	14368	13,500
Spend per pupil	5.04	6.27	12.53
Computers per school	10.7	12.41	68.9
Pupils per computer	22.4	18.31	12.13
E-mail in the office*	9	78	3
Worry about finance	1	24	7

*Staff in about five schools in the Autumn term (Group 2) reported using the Internet at home.

2.39   From these figures, a picture emerges of schools who have almost exactly the national average number of pupils per computer for their sectors as last published (DfEE figures, 1995), but probably slightly lower than is actually the case in 1996/7. The mean spends are also below the national average. It is difficult to see how the primary budgets could support ICT effectively, e.g. ISDN is out of the question. Some schools actually expressed concerns about finance although not asked directly; however, a majority expressed firm interest in joining Phase 2 for e-mail or WWW use (see Figure 5b in paragraph 2.41). At that time, they had no information relating to associated costs. This interest was not actually translated into purchase of support or curriculum activity under Phase 2.

2.40   It is interesting to note that the Group 2 primary schools showed a much higher level of e-mail use in the office compared with Group 1. This is believed to be a reflection of the progress of the County initiative to provide e-mail support for administration (see paragraph 2.1). This was in its early stages in the Summer term, but more active by the Autumn. Access to this service can be from home or school, using the user's login i.d. The access log cannot record the point of access, however, so it is interesting to note that five Group 2 heads mentioned using the service from home.

Phase 2

2.41   In their evaluations of Phase 1, schools were very positive about their likely involvement in Phase 2, with the majority interested in e-mail and/or WWW access (see Figure 5b).
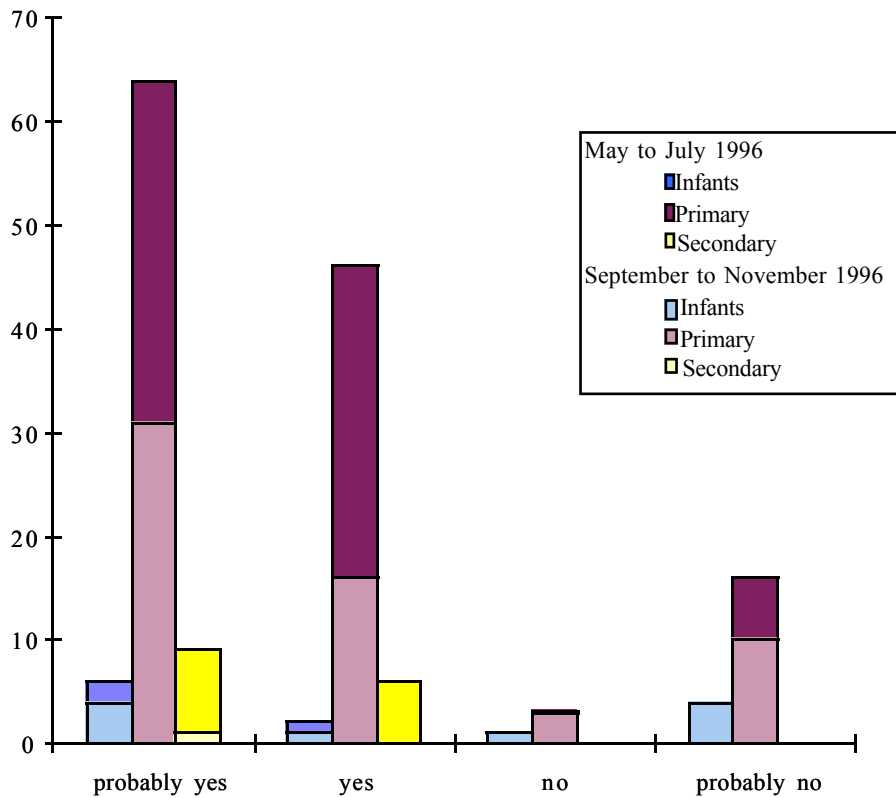
Figure 5. Future activity
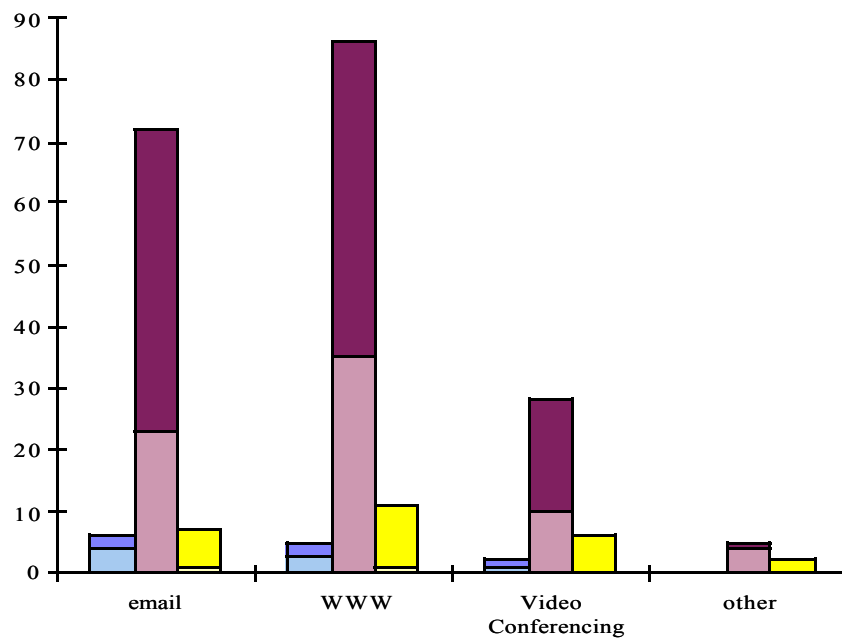

Figure 5a. Volunteers for Phase 2

Figure 5b. Likely future activity

2.42   This has not translated directly into Phase 2 activity. So far, no formal Phase 2 TML has resulted. However, 12 schools have expressed interest, spread evenly across the different options, and activity is planned to begin after the end of the Spring term. Interestingly, the schools who have expressed a desire to develop the use of video conferencing all want to use it to enhance communications projects they already have underway, for example a VC link to a local newspaper office to support the annual newspaper day in a secondary school. This would enable the pupils to use a more realistic source of up-to-the-minute news to incorporate in their own newspaper.

2.43   The lack of uptake of the official Phase 2 professional development is disappointing, but not wholly unexpected by LEA agency staff. Neither does this mean that the Phase 1 sessions have not met their stated objective, to raise awareness and promote the use of ICT in County schools. Schools are now less likely to react quickly to new demands on their resource or continuing professional development (CPD) budgets. Cambridgeshire was one of the first authorities to move to local management of funds. Whole-school development planning, with up to a 5-year horizon, is well established. It was unlikely, therefore, that schools would abandon their planned CPD for 1996/7 at short notice in order to adopt expensive (in terms of % budget spend) training in ICT. However, the increased level of ICT use generally leads LEA staff to believe that demand for support in this area will grow over the next 2 years, and will probably have a curriculum focus. They are keen to be involved in a second phase of 'evaluation', if it enables them to continue to monitor and develop this response.

2.44   Although formal activity under Phase 2 has not materialised, there is some evidence of increased use of the WWW since the Phase 1 courses. All schools have access to the WWW through the Bulletin Board, although an unknown number of schools use alternative service providers. Their use of this County-run service is monitored and, since September 1996, 33 schools have begun to use the WWW facility. For the 26 of these that were active in TML Phase 1, their WWW activity commenced after their attendance at a session. This is not necessarily proof of a link, but could be interpreted as an indicator that raised awareness of the potential of this free service actually encouraged schools to explore it. In most cases, access is frequent and regular following the course, and non-existent before.

2.45   Sixteen schools from Phase 1 were identified as having responded with a definite interest in Phase 2, and a significant budget allocation for ICT in the 1996/97 budget. They were sent a follow-up questionnaire to ascertain why they had not in fact joined Phase 2, and if they had any ICT-related activity to report. Nine schools returned questionnaires; one infant, six primary and two secondary.

Table 5. Uses of e-mail

	Administration	Staff other than admin.	Pupils
Infant	1		
Primary	6	4	
Secondary	2		

2.46 All of the schools' office staff are now using e-mail for administrative purposes, but only in four primary schools do the teaching staff use e-mail. No pupils have access.

Table 6. Users of Internet

	Staff	Pupils
Infant	-	-
Primary	4	3
Secondary	2	2

2.47 Where schools use the Internet, the pupils may have as much access as the staff. One primary school has stopped pupils' use after an exceedingly large telephone bill.

2.48 In one secondary school, the headteacher transfers work between home and school electronically. From the comments on the questionnaires, the responding schools were technologically aware. None of the schools use video conferencing.

Training

2.49 The main purpose of the questionnaire was to ascertain schools' reasons for not using the follow-up training sessions offered by the LEA. The first question elicited the schools' attitude to training in ICT by asking if any training other than the Phase 1 half-day had been provided for staff in the last 18 months. Four primary schools and both secondary schools had provided training, using a variety of sources including links with other schools, in-house training, and trainers such as NES Arnold, NCET, CITE and EdIT.

2.50 Schools were then asked which if any of the local authority packages interested them. Only four expressed interest, as shown in Table 7.

Table 7. Training in which schools were interested

	Video conferencing	What is the Internet?	Exploring the Internet	Internet resources for curriculum topics	Creating WWW pages
Infant	-	-	1	-	-
Primary	-	-	1	2	2
Secondary	1	1	1	1	1

2.51 The schools were then asked the reason for not taking up the LEA courses. Five schools said that their staff development budget was too small, and one that what budget they had was already committed.

2.52   One primary school said the course fee was too high (in fact this was the largest primary school), one that all funds had been committed to providing the hardware including the telephone line, and one that all training could be provided in-house.

School development plan

2.53   One secondary school said that it had ICT in the school development plan. One infant school, two primaries and one secondary mentioned that they had higher priorities in the plan. Three schools mentioned lack of finance in response to the question, and one lack of hardware.

Future staff training

2.54   One primary school will be using a named LEA advisory teacher for future training, two will train using in-school resources, and one secondary school will be giving Internet/e-mail training but does not mention the provider. The second secondary has ICT training covered in its 5-year plan.

Extra support required

2.55   The infant school felt that ICT was not suitable in Key Stage 1. Five of the primary schools and one secondary mentioned that financial support was needed, for training, hardware or cost of telephone bills. One secondary and two primary schools would like extra expertise, and time for staff to develop their skills.

Overall responses

2.56   Except for the infant school, the schools were positive about the use of ICT. Most found that finances restricted both its use and training. One school that had five IT experts on the staff felt able to develop its own training and future curriculum use without help. It seems that schools felt that the major restriction was financial, for hardware, training and running costs.