Technical support for ICT in primary schools.

Davies, Angela

TECHNICAL SUPPORT FOR ICT IN PRIMARY SCHOOLS

by

Angela Davies, B.Sc. (Hons) (University of the West of England, Bristol)

Thesis

submitted to the University of Wales in fulfilment of the requirements
for the Degree of Master of Philosophy, University of Wales, Swansea.

European Business Management School
University of Wales, Swansea
Swansea SA2 8PP
United Kingdom

January 2004

Declaration

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed.... .....(candidate)

Date .....20-5-04.....

Statement 1

This thesis is the result of my own investigation, except where acknowledgements of other sources are given.

Signed..... ..... (candidate)

Date .....20-5-04.....

Statement 2

I hereby give consent for my thesis, if accepted, to be available for photocopying and for inter-library loan (subject to the law of copyright), and for the title and summary to be made available to outside organisations.

Signed..... (candidate)

Date .....20-5-04.....

Summary

This dissertation questions whether deficiencies in technical support systems impede progress in introducing ICT into primary schools. The context of the study considers this as a possible barrier to the successful implementation of the government's objectives for increased use of ICT in teaching and the curriculum, as outlined in their National Grid for Learning consultation paper: Connecting the Learning Society, October 1997.

A sample of 37 schools from Swansea, Neath, Port Talbot and Carmarthen completed a questionnaire to establish the extent of technical support cover available and their opinions of it. Case study interviews were conducted in six of these schools one year later, to identify any changes which might have occurred during this time and to investigate certain aspects of technical support in more depth.

The study demonstrates that technical support provision is a major concern for primary schools. It investigates the factors that exacerbate and alleviate the problem and examines how current support arrangements perform. Results show that the situation is exaggerated by teachers' lack of confidence with ICT and that the lack of an appropriate time allowance for technical support is a major problem. The work also suggests that the reliance of many schools on older computing equipment is a reason why response times of local support agencies are often inadequate. Though the small number of replies may have compromised the study, evidence shows that primary schools in the sample all use the LEA technical support provider and had not been able to find cost-effective alternative sources of support. Examples of good practice are identified by the study and suggestions for future recommendations are made.

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Eberhard Bischoff, for his initial inspiration in the subject of this study and for his continual support during the process of the research. Many thanks also go to Steve Kennewell for his input during the formulation of the questionnaire and case study questions.

In addition, I am grateful to all the schools that completed the questionnaire and for the invaluable time given by the schools involved in the case study interviews.

Special thanks have to go to my family for their unconditional support during the production of this report and especially to my husband, Ceri, without whose help and understanding none of this would have been possible.

ANGELA DAVIES

University of Wales, Swansea

January 2004

To my family

CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

> "By 2002, all schools will be connected to the superhighway, free of charge; half a million teachers will be trained; and our children will be leaving school IT-literate, having been able to exploit the best that technology can offer."
> Connecting the Learning Society, Government Consultation Paper Oct 1997.

> "A lack of support when systems do not work is no longer an inconvenience, but an educational disadvantage."
> Sheyne Lucock, ICT inspector for London Borough of Barking and Dagenham.

1.1 Aims of the Study

The UK Government has for some time regarded improved ICT provision in schools as one of its main priorities in education. Indeed, it can be argued that the present Labour Government laid the foundations for its policies in this respect even prior to coming to power, for example, through commissioning the McKinsey report (McKinsey & Company, 1997) and the Stevenson Report (Stevenson *et al*, 1997). The latter concluded that "the Government would disadvantage the people of the United Kingdom if steps were not taken to integrate ICT into education".

The emphasis in the drive to increase ICT content in the curriculum has been, and still is, on the provision of equipment, such as the computers, peripherals and communications devices to permit internet access. Training aspects have also been

considered, but have in a sense been seen as being of secondary importance. In any case, they have focused on getting teachers to employ ICT in their teaching activities.

Anecdotal evidence from schools, however, suggests that the Government's initiatives may well be hampered by a lack of appropriate support in terms of teachers' technical expertise. When the first round of funds was made available to schools, there were many stories circulating of schools having classrooms full of new equipment which remained largely unused because nobody in the school was able to connect it up. Some of these stories were, perhaps, gross exaggerations and there is evidence that matters have improved over the years. However, there are still many reports of equipment not being used or not being utilised effectively because teachers lack basic technical skills and schools do not have appropriate access to technical support.

This issue is the central topic of the study. Its primary research question is to what extent deficiencies in technical support systems impede progress in introducing ICT into schools. The study focuses on primary schools in particular and considers support systems both internal and external to the school itself.

The role of managing primary school ICT systems usually falls on the ICT co-ordinator but, with the ever increasing complexity of today's computer systems, schools require proper technical support provision to achieve the government's targets of integrating ICT into teaching. The Annual Survey of Trends in Education carried out by the National Foundation for Educational Research (NFER, 2001) shows there was a significant increase in ICT resources and access to the internet in the previous three years, and that training had resulted in increased teacher confidence in the use of ICT. However, it found that the availability and reliability of ICT in primary schools was still a problem and teachers were not always able to take up the training offered. Furthermore, lack of technical support was reported to be a problem where half of head teachers surveyed said "technical support was the responsibility of a teacher but no additional time was given for the task". Computers need to be maintained and managed, very often the primary school ICT co-ordinator is expected to support the ICT equipment *and* be a full-time teacher.

The study was conducted within the specific support framework for primary schools in South Wales, more particularly in the Swansea, Neath, Port Talbot and Carmarthen area. The intention of this research is to examine more closely the provision of technical support for these schools as a possible barrier to the successful implementation of the government's objectives for increased use of ICT in teaching and the curriculum. This report draws on questionnaire and case study information collected from primary schools in the geographical area concerned.

The motivation behind this research stems from a personal background of working in a technical support department and from having three primary school aged children all competing to use the computer at home, either for games or to surf the internet for help with homework. There were many occasions in work where small businesses, having bought equipment with complimentary minimal training, could not afford to pay for a support contract that would enable them to ring and ask for advice or assistance in how to use the system. The situation with primary schools is not too dissimilar as they have become synonymous with small businesses themselves, having been given more control over their budgets. They too need ongoing support and advice when new computer systems are installed but do not have the budget to finance it.

1.2 Background

In 1993 the Government ordered a full-scale review of the National Curriculum under Sir Ron Dearing (Dearing, 1994). In his final report he separated Information Technology (IT) from Design and Technology (DT) to make it a subject in its own right. By 1998 it was recognised as being a basic skill required to survive in the modern world and as such became a core subject alongside English and Mathematics. Eventually IT was to become known as ICT when "Stevenson added the C for `Communications' in order to stress the potentially powerful aspect of computer use" (Dawes, 1999). A brief history of milestones in the development of ICT in education is found in Appendix A.

It became clear to the Government that an ICT strategy was required if schools were to benefit from the introduction of ICT. Two significant reports that identify this need are

the Stevenson Report (Stevenson *et al*, 1997) and the McKinsey Report (McKinsey & Company, 1997). The current Prime Minister, Tony Blair, shortly before coming into power in 1997, commissioned an independent inquiry by a non-political group to generate an objective analysis of the current usage of ICT in schools (Stevenson *et al*, 1997). Major input from the McKinsey Report (McKinsey & Company, 1997) showed that "the state of ICT in our schools is primitive and not improving with nearly 50% of primary school computers over 5 years old and a ratio of 1:30 computers to children in more than 30% of schools."
Stevenson *et al.* (1997) concludes:

> "...teachers lack the training, support, communications and therefore proficiency to be fully effective in the use of ICT because most leave teacher training colleges having received only 20-30 hours of IT tuition".

Recommendations are that Government strategies must address the issue of ICT as one of the top priorities and formulate a set of initiatives to "ensure teachers in training and in schools have the support they need to use ICT effectively in schools."

In response to the Stevenson Report (Stevenson *et al*, 1997) the Government launched its consultation document 'Connecting the Learning Society' (DfEE, 1997b). The aim was to encourage the widespread application of information communication technology (ICT) in teaching and learning in schools. The main intentions were to equip schools with modern ICT facilities and create a National Grid for Learning (NGfL) containing educational information and study material. Furthermore they planned a programme of in-service training for teachers and school librarians to enable them to make effective use of ICT in their professional work.

This consultation was closely followed in November 1998 with the Government's National Grid challenge 'Open for Learning, Open for Business' (DfEE, 1998a). In it they outlined their strategy for information and communications technology (ICT) in education and lifelong learning, signalling the beginning of the National Grid for Learning programme (NGfL or the Grid). The targets include connecting all schools, colleges, universities, libraries and as many community centres as possible to the Grid

by 2002. By this date all teachers should also feel confident and be competent to teach ICT within the curriculum.

By 1998	Plans for the Grid should be in process of implementation.
By 1999	All Newly Qualified Teachers would need to become ICT-literate to receive the award of Qualified Teacher Status.
By 2002	Serving teachers should feel confident, and be competent to teach, using ICT within the curriculum.
	All schools, colleges, universities and libraries and as many community centres as possible should be connected to the Grid, enabling perhaps 75% of teachers and 50% of pupils and students to use their own e-mail addresses by then.
	Most school leavers should have a good understanding of ICT.
	The UK should be a centre for excellence in the development of networked software content for education and lifelong learning, and a world leader in the export of learning services.
From 2002	General administrative communications to schools by UK education departments, Ofsted and other public bodies and the collection of data from schools should cease to be paper based.

Table 1:1 Timetable

In addition, Ministers announced that in 2000 each school should achieve a minimum level of ICT to ensure all pupils can take advantage of ICT in the classroom; as follows:

A computer: pupil ratio of at least 1:11 in primary schools and 1:7 in each secondary school.
A connection to the Internet in each school, with at least 20% of schools connected at broadband level.
At least one networked computer with Internet access in each school for management and administrative purposes to be achieved in time for the January 2002 pupil census.

Table 1:2 Targets for 2000

1.2.1 The National Grid for Learning

The National Grid for Learning, also known as the NGfL or the Grid, is a comprehensive programme funded by the Department for Education and Skills (DfES) and managed by the British Educational Communications and Technology Agency (Becta), the Government's lead agency for ICT in education. The Grid will provide a focal point for learning on the internet and develop the means to access that content through infrastructure, funding and training. The educational content on the internet will be monitored by Becta and will grow steadily according to the needs of its users. Becta will also provide infrastructure through NGfL Certified Managed Services, where independent companies certified by Becta, will offer a new way of purchasing ICT needs. They will provide a one-stop-shop for equipment and services such as support and advice. The benefit to schools would be the transferral of technical problems onto the supplier.

1.2.2 The New Opportunities Fund

The New Opportunities Fund (NOF) is a public body set up to distribute National Lottery money to Health, Education and Environmental projects. The NOF will use £230 million (£12.65 million in Wales) to fund the training that will ensure serving teachers have the confidence and competence to make effective use of ICT in the classroom. The training will be based on the expected outcomes of the Initial Teacher Training (ITT) National Curriculum for ICT, as outlined by the Teacher Training Agency (TTA). A list of approved training providers will be available from the NOF. The funding is available for full time teachers only; it does not extend to training for Teaching Assistants or Supply Teachers.

1.2.3 Structure of the Report

The report is divided into seven chapters. Chapter 2 examines the literature available on the subject of ICT technical support in primary schools. Many of the official surveys

only consider the situation in England and not the UK as a whole. The situation in Wales is documented much less frequently and in less depth. The general consensus would appear that broad government targets are being met by most schools, such as the ratio of computers to children and a connection to the internet. However, the question arises whether these achievements are sufficient to enable teachers to make effective use of ICT in the classroom. Even though they are reaching these broad targets there is evidence in the literature to suggest that poor technical support is hampering progress (Ofsted 2001; Becta/DfES 2001a).

Chapter 3 describes the methods used to carry out the investigation. Questionnaires were sent to participating schools between November and December 2000 with six follow up case studies carried out a year later. The research had the support of the Local Authorities concerned, but one of their requirements was that participating schools should remain anonymous. In reporting the case studies, measures have been taken to protect the anonymity of the respondents.

Chapter 4 discusses some detailed research questions. It was thought, for instance, that there might be links between the size of school and the extent and types of support problems experienced. Whether or not the school has a technically trained ICT co-ordinator was felt to be a potentially important factor and the research was also intended to explore various aspects concerning the efficiency of external hardware support. After discussing some of these questions in more detail, Chapter 4 presents the raw results of the questionnaire survey.

The survey results are analysed in Chapter 5 and draws comparisons with some of the other studies identified in Chapter 2. The chapter then concludes with a summary of the main findings. Chapter 6 describes the case studies conducted one year after the questionnaires, in 2002, and discusses the issues arising from these. The full transcripts of the interviews are found in Appendix C. Finally, Chapter 7 summarises the analysis from the previous chapters and consolidates the findings. It also reflects on some of the limitations of the research and makes recommendations for the future.

Chapter 2

REVIEW OF THE LITERATURE

2.1 Government Initiatives

The aim of this chapter is to explore the changing role of technical support in primary schools. As early as 1995 the government were considering the benefits of using computers in schools with their first consultation on information technology "Superhighways for Education" (DfEE, 1995). This initiative considered raising standards and attainment in education by using technology. According to the report, the development of teachers' expertise and confidence in technology would be dependent on a number of factors, one of those being appropriate technical back-up and expert support, from both inside and outside the school. Evidence that ICT was having a positive impact on levels of education (DfEE, 1997a) helped to form the government's strategy for ICT in education. Their challenge, (DfEE, 1998a) outlined The National Grid for Learning (NGfL) strategy which aimed to provide easy access to educational material on the internet. It would also provide funding to develop infrastructure in schools and introduce training programmes for teachers to develop computing skills.

These Government initiatives have increased the demands made on the ICT co-ordinator substantially. For schools to incorporate technology into their lessons they need the right equipment and they need the right skills. Funding from the NGfL will enable schools to purchase infrastructure for accessing the Grid and it will provide training for serving teachers to develop their skills so they can maximise the benefit of this facility. Newly

qualified teachers will already be conversant in ICT having gained QTS (Qualified Teacher Status) during their teacher training course. The intention is that all teachers and pupils will eventually use ICT as an integral part of their teaching and learning.

2.2 The Effect of Increasing Investment

The increase of investment in ICT for schools has resulted in an ever growing set of resources that require technical support. Evidence from the Department for Employment and Skills annual surveys on ICT in schools (DfEE 2000; DfES 2001; DfES 2002; DfES 2003) identifies that improvements are being made to the ratio of pupils to computers in primary schools each year since the government initiatives were introduced, however, in many schools, the quality and age of ICT resources still pose continuing problems (McKinsey & Company 1997; Preston *et al.* 2000; Ofsted 2001; Liberal Democrats 2001). There are also vast differences between primary schools where the pupil to computer ratios can vary greatly from 30:1 to 5:1 (Ofsted, 2001). This report observed that once teachers have completed their ICT training and are encouraged to use computers for teaching, it will be difficult for those schools with relatively few computers to achieve this. More recent evidence from Becta/DfES (2002) recognises that an important influence on the eventual use of ICT in teaching is the amount of ICT resources available to the teachers. In primary schools it is still frequently reported that teachers have only one or two computers in a class. This affects the way they can use ICT in the classroom, indicating that more resources are needed, and as a result teachers will need more training if they are to move forward in the way they use ICT for teaching and learning. This mix of old and new computers poses a problem for newly qualified teachers who perhaps learnt ICT on modern equipment. Galanouli and McNair (2001) report that some trainee teachers have found schools still using old Acorns or old Apple Macs. This lack of appropriate equipment presented a barrier to the students' use of ICT in their school placements and as one student pointed out: "if they [the schools] don't have the facilities it is very hard for us to do anything." Even though this equipment is still well used (Galanouli and McNair 2001; Liberal Democrats 2001) it is a drain on technical support and cannot easily be upgraded to connect to the internet. This suggests that the effects of the Government initiatives should not only be measured in terms of

the ratio of children to computers, but from the use of ICT made by the teachers and children in their classrooms. Therefore an important requirement, to enable schools to achieve the government's targets for the NGfL, is to install internet ready equipment and software which is modern, reliable and available for use, whenever it is required by teachers in class. However, as the ICT resources increase, technical support becomes a bigger priority.

2.3 Definition of Technical Support

The term technical support is synonymous with ICT support and as such can be open to misinterpretation. In business, the term 'technician' would be used for this job, but ICT support in education is also about supporting teachers, learners, managers and administrators in the use of ICT. In this environment, the term is insufficient. In primary schools, ICT or technical support is usually the responsibility of the ICT co-ordinator and there are various explanations of what constitutes technical support in the literature. Becta/DfES (2001a) state that "Technical support involves two components: a technician and a stable network", whereas the NGfL points out that the ICT co-ordinator is the front-line technical support, sometimes helped by classroom assistants and technicians.

Becta/DfES (2002) and Becta/DfES (2004) provide alternative definitions of technical support, but the most appropriate one (Becta, 2003), successfully encompasses the many facets that have since become the remit of the ICT co-ordinator in many primary schools, as a response to the increased usage of ICT. The job is classified under four separate headings:

CLASSIFICATION	CHARACTERISTICS
Repair	Actions that are required when hardware or software breaks down
Maintenance	Actions to check the operation of hardware and software, to install new software, or to check the efficiency of a network
Trouble-shooting	Actions that are required when something happens unexpectedly, when an error occurs, or a teacher does not know how to solve a problem
Training for teachers and support staff	To enable them to use ICT equipment, become aware of the technical problems that arise, and show them how to deal with the most common ones.

Table 2:1 Technical Support Definition

This definition is also in line with the American view (Ronnkvist *et al*, 2000) of technical support which uses the more specific term 'technology support' to indicate there is more to the job than just being a technician. Pedagogical support must be included alongside troubleshooting of problems. Ronnkvist *et al.* (2000) states that technology support involves access to hardware and software support, training, and the provision of 'peopleware' i.e. someone assuming the role of technology co-ordinator. The report shows that only 19% of these technology co-ordinators work full-time and over two-thirds of American schools do not have a full-time technology co-ordinator.

2.4 Characteristics of Good ICT/Technical Support

Having established a clearer definition of technical support, what elements are necessary to provide good technical support? The following characteristics describe a primary school where the support system for ICT is working well (Becta/DfES, 2002). Firstly, there is a supportive headteacher encouraging staff to use ICT; secondly, there is a

system of technical support in place enabling teachers to concentrate on the educational use of ICT and not trouble-shooting problems; thirdly, the ICT co-ordinator and any other technical staff, clearly understand their role and have the necessary support, time and resources to carry it out; and finally, senior managers have a strategic plan for the development and maintenance of the school's ICT resources.

A series of reports from Becta/DfES (2001a, 2001b and 2002) are based on findings from research into the roll-out of the NGfL. The NGfL Pathfinder Programme surveys a number of LEAs in England to assess their use of ICT. The findings show that improvements in staff competence and confidence are due to the quality of leadership, from both the headteachers and the ICT co-ordinators. This is helped by the fact that primary schools generally operate as a single supportive team of teachers. Other findings from the same research indicate a problem with time constraints hampering the provision of technical support, although some schools try to share the responsibilities across staff and headteachers. Ofsted (2002) supports the findings that ICT co-ordinators in primary schools have too many demands on their time, on top of their full-time teaching obligation. Where schools lack appropriate ICT support provision, teachers become frustrated when problems arise, putting more pressure on the ICT co-ordinator to provide a solution.

Technical support provision can come from a number of alternative sources based either internally or externally. The following table, with figures taken from DfES annual surveys (DfES 2002, DfES 2003), outlines the options for technical support that exist for schools and compares the percentage changes from 2002 to 2003. These figures are based on schools in England only.

SOURCE OF TECHNICAL SUPPORT	2002	2003
LEA	66	69
Own Teaching Staff	59	46
External Service Provider	45	40
Own ICT Support Staff	25	29
Other	11	12
Another school or college	6	11

Table 2:2 DfES Sources of Technical Support

The percentages of schools using each source of support have changed slightly from one year to the next but the ordering of the most popular choice has stayed the same.

The National Foundation for Educational Research (NFER, 2001) provides a slightly different list of sources shown in the following table with their percentage of use:

SOURCE OF TECHNICAL SUPPORT	2001
LEA	50
Teacher with no time allocated	50
Teaching staff with time allocated	19
Non specialist technician in school	16
External company	9
External company called ad hoc	8
Other	13

Table 2:3 NFER Sources of Technical Support

Although the two tables show slightly different options for technical support it is clear that the LEA support provider is the most commonly used source on both surveys, closely followed by a teacher.

2.5 Dissatisfaction with ICT technical support

There are numerous examples in the literature showing dissatisfaction with technical support (e.g. Williams *et al.* 1998; Leask and Williams 1999; Leask and Pachler 1999; PricewaterhouseCoopers 2001). The quality and availability of technical support has been found to be a critical factor in aiding or hindering whole-school development of ICT (Becta/DfES 2001a and 2001b). If teachers are not confident with the technology, they need to have two lessons prepared, one for use with the computer, and one without. Insufficient or unreliable equipment reduces its availability (Pelgrum, 2001) and also reduces teachers' confidence (Ofsted 2002; Preston *et al.* 2000), neither of which helps to motivate teachers to use the equipment. In some circumstances equipment is just too old to be repaired economically and the support for these machines is too expensive to

consider (Liberal Democrats, 2001). More recently, evidence from Becta (2003) shows schools to be least satisfied with support provided by a manufacturer. The next section looks at the external support available to schools in more detail.

2.6 External Support

The repair and maintenance aspects of technical support can be undertaken in a number of ways. One option is for the school to employ a support technician directly or they could share a technician with other primary or secondary schools. Alternatively, they could sign a contract with an external company to provide the support, or use the LEA support provider. Each of these methods relies on the school having the necessary budget to pay for a support contract. The decision on which option to choose is made by the primary school as they are responsible for spending their own budget on what they consider to be the best option for them.

2.6.1 LEA Support

Becta/DfES (2003) observes that primary schools most commonly use their LEAs as providers of technical support. This is supported by Ofsted (2001), NFER (2001), DfES (2002), Becta (2002) and DfES (2003). However, Becta/DfES (2001a) reports that schools typically expect more support than the LEA is able to provide, although they may not appreciate that the NGfL programme did not allocate funding to LEAs for technical support. A few LEAs support schools well by providing prompt and effective technical help when it is needed, but continuous access to reliable, affordable, support remains a problem for the majority of schools (Ofsted, 2001).

Becta/DfES (2001b) defines four different LEA approaches to supporting schools.

Type A: is a decentralised approach where schools make their own choices about infrastructure. They offer a good range of low cost services and there is usually some familiarity between them and the school.

Type B: a team from the LEA is fully responsible for technical support including connectivity, hardware and software, but the internet is usually contracted out to a third party.
Type C: a form of managed service is provided between the LEA and a private company providing all networking, hardware, software and content.
Type D: Agreements are made with a private company but schools often feel frustrated because the computer network and software were not tailored specifically to their needs.

However, as the pathfinder study progressed, the differences between each LEA type became less distinct. Becta/DfES (2001b) reported in one-to-one interviews that there were fundamental worries about the level of technical support provided by LEAs. Many schools do not believe they are receiving an adequate service for the money they are paying.

2.6.2 ICT Technicians

Technicians can be employed either in place of the LEA support provider or to supplement the work of an ICT co-ordinator in a primary school. Research shows that some schools are forming a consortium to share a full-time technician. (ACCAC 1998; ACITT 2001). NPADC (2001) quotes that 32.9% of primary schools in the year 2000 were using a technician employed by the school. They further point out that primary schools were much more likely to have employed a technician to deal with support and maintenance. Ofsted (2001) and NFER (2001) also report that schools use a specialist technician but this option is costly. A drawback of this approach was highlighted by JAPONITE (2001) saying that some primary schools have bought in part-time technicians but they are difficult to recruit and are often headhunted by businesses who can afford to pay them a more competitive salary. Technicians are usually based at the school, or shared between groups of schools. Ofsted (2002) and Becta/DfES (2001b) further observe that these technicians can be employed either full-time or part-time. Many schools regard this as the ideal because it greatly reduces the response time for dealing with problems and allows teachers to channel their energies into using ICT for teaching, rather than technical troubleshooting.

2.6.3 External agency

Support agreements with external agencies can either be an ad hoc arrangement where call-outs are paid for at the time, a maintenance contract with a specific service level agreement or via a managed service. When its ICT initiatives were first introduced, the Government expected that schools would need managed services for ICT in order to provide 'a one-stop shop' to deal with all equipment purchases and technical support (Ofsted, 2001). A survey performed by NFER (2001) quotes that 9% of schools surveyed have a contract with an external company. NPADC (2001) note that some schools have more than one arrangement in place with a support provider. For some schools a managed service provider has radically improved the level of technical support (Becta/DfES, 2001b). However, JAPONITE (2001) says the government was keen to promote managed services but they are too expensive for most schools. Ofsted (2001) also supports this view that the costs involved are too high. The situation is quite different in Wales as not one of Becta's 12 certified Managed Services are based here.

2.7 Internal Support

Troubleshooting and resolution of common problems are just a small part of the responsibilities of the ICT co-ordinator. They are the first line of contact for technical support, unless there is a technician or ICT assistant at the school. Depending on their aptitude, skills and confidence they either solve the problem themselves or turn to the advice of their LEA service provider. The role of ICT co-ordinator has greatly developed over the years (Becta/DfES, 2001a) and now covers "strategic vision, team management, technical support, purchasing and maintenance of equipment, day-to-day management of the network, curriculum support, materials development and in-service training". Ofsted (2002) highlights that there are too many demands placed on ICT co-ordinators. For some teachers no time is specifically allocated to do the job (JAPONITE, 2001). Headteachers responding to an NFER study (NFER, 2001) mention that 50% of teachers performing the co-ordinator role had no additional time allowance.

> "There is a great deal of reliance on the goodwill and enthusiasm of knowledgeable teachers and head teachers. While peer support is an important ingredient in the success of any organisation, the over reliance on a few overburdened colleagues clearly worries many teachers" (Williams *et al*, 1998).

Further evidence of the lack of time allowance can be found in (ACCAC 1998; Lynch *et al.* 1999; NFER 2001; Pelgrum 2001; Ofsted 2002; Knight 2002).

The choice of teacher to handle the role of ICT co-ordinator has to consider a number of factors such as their abilities in subject co-ordinating and their technical skills. In practice this is not a hard and fast rule. Sometimes it is a combination of willingness and aptitude for the subject. Often the ICT co-ordinator is the "NQT (Newly Qualified Teacher) who has only just done the training and should be confident", or it is "the member of staff who wasn't at the meeting" or it could even be "a deputy head, head, or an experienced teacher, basically, whoever the head thinks is most clued-up gets the job" (description taken from the NGfL Technical Support Pages which are no longer in existence). These examples highlight the fact that confidence in ICT is an important quality for teachers undertaking the role of ICT co-ordinator (Williams *et al.* 1998). However, evidence at the time showed that there were still many teachers who lacked this confidence (Dawes 1999; NPADC 2001; Pelgrum 2001; Ofsted 2002).

NFER (2001) suggest that there is a significant increase in teachers' confidence in the use of ICT after training. This is backed up by Becta/DfES (2001b) "There has been a significant increase in teachers' confidence and competence with ICT, although there is a continuing need for in-service training." Preston *et al.* (2000) have noted that many ICT co-ordinators are in greater need of training in teaching ICT than their colleagues. This view is supported by ACCAC (1998).

In order to reduce the pressure on the ICT co-ordinator, Becta/DfES (2001a) identify that "Some schools have adopted a strategy of sharing the co-ordination responsibilities across a number of staff, including the head teacher, deputy head teacher with responsibility for the curriculum, and subject co-ordinators or leaders." Becta/DfES (2001b) refer to NQTs acting in the capacity of support to the ICT co-ordinator and

Ofsted (2001) gives an example of using a technology student from a local university to help reduce the workload. Other sources of help, mentioned by NFER (2001), are classroom assistants, learning assistants, parents and governors.

2.8 Funding

Funding for technical support was not planned for in the NGfL programme. Becta/DfES (2001a) identifies that LEAs try to ensure there is sufficient support for ICT in their schools, despite the fact that there is no extra funding from the NGfL for technical support. Prior to the NGfL Programme, funding to LEAs for central services had been cut making it difficult to provide adequate technical support to schools. With the latest increases in equipment, greater demands have been placed on technical support and funding needs to be increased to cope. In the same year, PricewaterhouseCoopers (2001) also concluded there should be "continued consideration of schools funding requirements to enable them to put in place effective ICT support". As the level of computer equipment increases and schools become more dependant on it, funding will have to be made available to help pay for the extra support needed. For primary schools the situation is often very difficult, since they can rarely afford to have technical support on site (Becta/DfES, 2002) and as such have to rely on the most cost-effective solution, usually an LEA Service Level Agreement (SLA).

2.9 Teacher training

Trainee teachers need to have practical experience with computers to build up their confidence. The more confident they are, the more likely they are to try and resolve their own problems before calling on the ICT co-ordinator. During teaching practice their confidence and competence could be enhanced by more technical support (Bennett at al. 1997; Cox et al. 1999). From 1999 all newly qualified teachers will have gained basic skills in ICT as a requirement of the QTS (Qualified Teacher Status) award. Adams (1998) states that student teachers often don't get the opportunity to use ICT in teaching practice. Evidence of inadequate training is also found in Pritchard (2001) and Preston *et*

al. (2000). Teachers also complain of having no time available to become familiar with the new technology (Williams *et al.* 1998; WIS 1997; Mumtaz 2000b; Pelgrum 2001). The level of ICT competence covered in the ITT course comprises only a few basic skills such as loading software, connecting a printer, checking connections, replacing consumables and setting up ICT equipment (DfEE, 1998b). Becta/DfES (2001c) identifies that teachers need much more training to improve the way they use ICT in their teaching.

Teachers already in service will be brought up to the necessary standards in ICT using The New Opportunities Fund (NOF) training scheme. There are mixed reports in the literature regarding the NOF training. Ofsted (2001, paragraph 80) states that it increases confidence, whereas the Welsh Assembly (2000) mention that training is widely perceived to be very basic. ICT, they suggest requires a demanding range of knowledge and technical skills not covered by this course. Becta/DfES (2001a) supports this view and reports dissatisfaction with training on the basis that it was "disorganised, lacking focus and too fragmented and text based." Ofsted (2002) reports that the NOF training continues to disappoint many teachers but points out that the scheme has improved basic skills. This situation obviously needs to be tackled as research by Galanouli and McNair (2001) shows that new teachers are disadvantaged in school placements where teachers lack competence and experience with ICT.

2.10 The situation in Wales

(WIS, 1997) "There is a policy vacuum in Wales."

In 1999, ADEW (The Association of Directors of Education in Wales) and the National Assembly for Wales, commissioned the Wales Information Society (WIS) to produce a survey of ICT provision. One of the key points to come out of this report was the high percentage of teaching staff that were still 'technophobic'. The group basically agreed with the government's targets, set out in "Connecting the Learning Society", but also recommended "a target for Technical Support, which is desperately needed for schools. The majority of teachers lack extensive technical skills, so without adequate support broken systems can be out of action for considerable periods, reducing staff and pupil

motivation." It was also clear to the group that whilst NCET (now Becta) provides a good service for schools in England, they are based too far from home to be viable in Wales and the site contains very little information pertinent to Welsh education. Overall the feeling of the group towards the integration of ICT in schools was "There is a policy vacuum in Wales".

ADEW produced evidence of ICT procurement to the Pre-16 committee of the National Assembly for Wales (Welsh Assembly, 1999) and in it considered the future developments of ICT in schools. Implications are that all schools would be connected to the 'local Grid' by 2002 but not necessarily all classrooms, so teachers and pupils will not necessarily have access to the NGfL. As Becta has a low profile in Wales, suggestions were made about developing a Welsh NGfL. At the time of the report not one of the 12 Becta certified Managed Services are based in Wales. Further observations show that financial provisions in Wales lag behind those of England, for projects to encourage the use of ICT. Concern for provision of adequate technical support opportunities was also voiced. It was agreed schools will have to budget themselves for this facility. Training was also mentioned as a requirement, although, at the time of the report, little information regarding NOF funding was available. Concern was also expressed at the shortage of funds to cover supply teachers whilst training was undertaken, although some LEAs were utilising INSET days for this purpose. A further complaint was the lack of Welsh medium training materials. The underlying message of this article is that "ICT developments in Wales have to take proper account of not only the 3 'Cs' - Connectivity, Content and Competence - but a fourth 'C' – Cymru".

In response to this evidence, the Welsh Assembly appointed an expert adviser to the Pre-16 Education Committee to widen the original remit and consider the future strategy for ICT in schools in Wales. The report (National Assembly, 2000) incorporates a review of ICT training for teachers and the creation of a National Grid for Learning in Wales. Equipment provision figures show a ratio of between 1:10 and 1:30 computers to children, but these include old machines. Computers will need to have internet capability to achieve the government target of being connected to its LEA by 2003. Provision of systems maintenance and a help desk service in each LEA is suggested to support this target. Estyn, The Office of her Majesty's Chief Inspector of Education and Training in

Wales (2002), identified a shortage of skilled labour for systems maintenance technicians and recommends using local colleges to develop suitable courses. The Assembly should also look at the development of courses at Further Education Colleges for school based ICT Systems Maintenance Technicians, using the local CCETs. This is an area of identifiable skills shortage within Wales and thus potentially eligible for Objective 1 funding support.

2.11 Summary

As the use of ICT increases throughout schools, the provision of more cost effective and immediate technical support is crucial for the successful integration of ICT into the curriculum. The results of the Liberal Democrat survey (Liberal Democrats, 2001) indicate that for many schools ICT provision is improving but schools are struggling to keep up with the changing pace of ICT, both in terms of equipment purchasing and in terms of maintenance and repair. Teachers and schools would also like some form of inexpensive and reliable continuing technical support, preferably in-house. Williams *et al.* (2000b) define possible future developments for technical support to incorporate a 'Help Desk', where there is always help available at the other end of a phone; the provision of training for school technicians; creation of Resource Centres with libraries of information and the sharing of resources and knowledge through the use of web pages on the internet.

ICT co-ordinators' workloads have increased considerably since the introduction of ICT into the curriculum, with technical support demanding a large proportion of their working day. A study by PricewaterhouseCoopers' (2001) into teacher workloads says that teachers should be relieved of tasks that are not related directly to teaching. In response to this study, a report was compiled by the Workforce Agreement Monitoring Group (WAMG) composed of representatives from ATL, DfES, GMB, NAHT, NASUWT, NEOST, PAT, SHA, TGWU, UNISON and the Welsh Assembly Government The group identifies the task of technical support as additional to the normal teachers' workload and recommends it be transferred to support staff. Whether all schools could afford this approach is debateable, given the pressure on school

budgets. However, this proposal provides an effective solution to the increasing pressures of the ICT co-ordinator's job. It would introduce a more successful mechanism for schools to provide more immediate and necessary technical support.

Chapter 3

RESEARCH METHODOLOGY

3.1 Research Strategies

Many techniques are available to collect and store information for subsequent analysis. Saunders *et al.* (1997) classifies these techniques into research strategies grouped under the following headings - experiment, survey and case study. Experiments are usually conducted on selected samples from a known population with variables measured under changing conditions. This strategy is usually associated with social sciences and psychology therefore not applicable to this study. Surveys, on the other hand, are popular in business and management research for collecting large amounts of data from extensive populations. This facilitates the economical and convenient gathering of standardised data by means of a questionnaire.

The third method to be considered, the case study approach, suggests further data collection can be realised using structured interviews and observation. This technique is useful for gathering information that does not fit into experimental or survey methods. Detailed knowledge is obtained for a small number of related cases through interview, observation, documentary analysis and questionnaires. This is a good method for exploring a situation and understanding 'Why?' in addition to 'What?' and 'How?' which can be established from a survey.

3.2 Project Methodology

For this study a questionnaire survey was chosen in order to reach as many primary schools as possible in the chosen area. This method of data collection is a more efficient way of covering the large geographical area quickly and cost effectively. It also allows the recipient to answer the questions when time allows, which was thought to be an essential aspect for primary school ICT co-ordinators. A mix of quantitative and qualitative information can be gathered in this way. The questionnaire design is described in Section 3.6. To substantiate the results from the questionnaire and explore the situation further, it was decided to conduct a series of case studies a year later. This would help identify any changes in the provision of technical support and as a result the level of satisfaction. Information would be gathered by means of a face-to-face interview using a semi-structured technique to allow for flexibility of questioning and discussion during the visit. These research methods were chosen as the most appropriate given the nature of the research and based on considerations of time, cost and distance.

3.3 Methodology Limitations

From the literature (Saunders *et al*, 1997) it is well documented that postal surveys and questionnaires suffer a poor response rate that could be due to pressures of time, 'fatigue to junk mail' or receipt of too many other questionnaires. To overcome the anticipated shortage of replies a large enough sample size must be targeted. Return rates could be improved if an incentive was available but this involves financial backing not readily available to this project. The task of gathering information from a large population efficiently and at minimal cost, cannot easily be achieved by any other method. The ideal scenario would be to visit every school, ask them to fill in the questionnaire and then wait to collect the completed answers. Unfortunately, this approach is neither efficient nor cost effective and as such does not offer a real alternative.

Questionnaires, however well written, can also suffer from ambiguities which cannot be clarified at the time. Planning and trialling questions can help reduce these

misunderstandings by testing more appropriate wording or by rephrasing a question, but if a respondent deliberately wants to misinterpret a question or decides they want to impart information not asked for then no amount of attention to detail will prevent this. Interpretation of answers can also be a problem for open format questions that need to be coded for comparisons during analysis. If the answer is not explicit it may be incorrectly coded and therefore skew the results. In this case data would be unreliable and have to be omitted.

Case study interviews can also suffer from limitations. If the wrong person is being interviewed then it is unlikely the answers will be satisfactory or sufficient. Time considerations are another problem, not only in agreeing a convenient time to meet but for both parties to have enough available quality time to complete the questioning. It is also important to accurately record the answers and some methods are more prone to error than others. Handwritten transcripts need to be typed up soon after interview before details are forgotten. More efficient means of recording an interview, such as a tape recorder may not be available to the interviewer.

3.4 Distribution of the Questionnaire

As stated in Chapter 1, the geographical area covered by the research comprises Swansea, Neath, Port Talbot and Carmarthen. For contact details primary school lists were obtained from the web pages of The City & County of Swansea and Neath Port Talbot County Borough Council. Swansea primary schools, including designated Welsh Primary Schools and Voluntary Aided, totalled 71, whilst in Neath Port Talbot 51 schools were listed. All schools were chosen for contact from these lists giving a sample size of 122. Carmarthen primary schools listed in the Carmarthenshire Education Directory totalled 133 so a manageable sample was chosen by selecting every third school on the list, giving a total of 43.

Primary schools in Swansea, Neath and Port Talbot originally came under the single county of West Glamorgan with a shared LEA Technical Support Centre. The centre offers technical and curricular support with a Service Level Agreement (SLA) contract

to the schools. Swansea has since become a county in its own right with Neath and Port Talbot merging as a combined county borough. The implications of this reorganisation are highlighted during the case studies documented in Chapter 6. In order to get a balanced picture for the information collected, a sample of schools in the neighbouring county of Carmarthenshire was included in the questionnaire survey. This county also has a LEA technical support centre providing schools with technical and curricular support and SLA contracts.

In order to conduct the research in the chosen primary schools it was first necessary to contact each LEA. Permission to approach all Swansea schools was obtained from the Swansea Local Education Authority in a meeting with the Head of School Improvement. The study was discussed in detail and an invitation offered to enter questions of their own interest on the questionnaire. Assurances were made of school confidentiality and for gaining their approval of the questionnaire before sending out. It was suggested that a meeting with the Technical Support Centre prior to creating the questionnaire would help formulate appropriate questions. At a meeting with the Head of the ICT Technical Support Centre in Port Talbot, consent was granted to approach Neath Port Talbot schools for inclusion in the research. Approval of the final questionnaire was requested by them prior to its delivery and they were offered the opportunity to submit questions that incorporate their own interests in this area. Interviewing the head of the centre gave an insight into how the system works for those schools with a support and maintenance contract and a tour around the centre helped put things into perspective. Finally Carmarthenshire Local Education Authority was telephoned for consent to contact primary schools in Carmarthen for inclusion in this project. Permission was granted, although it was pointed out that surveys are not generally promoted due to the time involved in completing them. The general impression given was a lack of interest and a copy of the questionnaire was not required for approval.

The following table shows the number of schools selected from each authority to be targeted with a questionnaire and the resulting response rates. Schools were also invited in the questionnaire to be involved in the follow up case studies, either with a visit or during a telephone call, and the results of their responses are also presented in the table.

LEA AREA	TARGET	REFUSALS	SAMPLE SIZE	REPLIES	CASE STUDY	
					Phone	Visit
Swansea	71	10	61	20	6	5
Neath Port Talbot	51	5	46	11	4	2
Carmarthen	43	3	40	6	5	0
Total	165	18	147	37	15	7

Table 3:1 Distribution of Questionnaire

The total number of questionnaires sent out gives a sample size of 107. The return of 37 completed questionnaires gives a response rate of 34.6%. There was concern that the low number of responses, which is not unusual for a postal questionnaires, might compromise the results but, as quoted in the book Saunders *et al.* (1997, p128):

> "In such instances the Economist's (1993) advice of a minimum number of 30 for statistical analysis provides a useful rule of thumb for the smallest number in each category within your overall sample."

To improve the chance of the questionnaires being read, target schools in Swansea, Neath and Port Talbot were telephoned during November and December 2000 explaining the reason behind the research and asking permission from the head to send a questionnaire to the ICT co-ordinator. Of the 71 Swansea schools listed 3 had already been used for the pilot and were not recalled, 2 refused to take part on the grounds they had other questionnaires to fill in, 3 could not be contacted and 2 never returned the phone call as promised leaving a sample size of 61. No schools in Neath Port Talbot refused to take part in the survey although 5 schools could not be contacted for various reasons leaving a sample size of 46. Questionnaires, in both instances, were sent out the next day to the willing participants with an explanatory covering letter.

The target of 43 Carmarthen schools was contacted by telephone during April 2001. Responses included one school refusing to take part, one not returning the call and one unavailable thus giving a sample size of 40. Questionnaires were sent out to those in

agreement with an explanatory covering letter containing a date by which completed forms must be returned.

3.5 Recording Responses

To automate and thus enhance the efficiency of sending out letters and questionnaires to the 107 schools, pertinent information was stored in a Microsoft Access database. Using Microsoft Word's Mail Merge facility, names and addresses could then be used to merge in letters, add to questionnaires and create address labels by printing the relevant information directly onto sticky labels. Other useful information could also be stored, for example the date of sending out a questionnaire and the date of receiving a completed form thereby simplifying the task of checking which schools had replied. Non-replying schools could then be sent a chasing letter with an extended deadline to entice them to reply. Also recorded was a tick box indicating which schools were interested in the follow up case study interviews and whether by phone or visit. Data collected from the questionnaires and case study interviews was entered into a statistical software package called SPSS for further analysis.

3.6 Questionnaire Design

The questionnaire was designed in consultation with the Director of Education at Swansea Local Education Authority and the Centre Manager at the Information Technology Centre. For practical reasons, the questionnaire needed to be straightforward to complete since teachers are generally busy. Questions were carefully worded, with the assistance of Steve Kennewell, lecturer in ICT for Secondary PGCE at Swansea University, to avoid ambiguity and ensure the required information would be obtained. At the time of telephoning for agreement to send the questionnaire, Welsh speaking schools were asked if they would prefer the document translated into Welsh, or whether an English version was acceptable.

Questions were grouped into four sections, each with a distinct focus, and categorised under the following headings:

Section 1: School Details
Section 2: Equipment and Usage
Section 3: Computer Support Provision
Section 4: Open format questions

A disclaimer was printed at the top of the first page stating all details would be treated with the strictest confidentiality and names and addresses would be used for contact purposes only. Questions were kept concise using tick boxes where possible for ease of completion and analysis.

Section 1 contains details about the school such as address, names of head and IT Co-ordinator (for contact purposes only due to promised anonymity), number of children, type of school (e.g. voluntary aided) and the name of their Local Education Authority, for use in comparisons. Two further questions with tick boxes were included for schools to indicate whether they would be prepared to take part in a case study follow up visit or a telephone interview lasting approximately half an hour. Information from this section was to be used for comparison with existing reports considering the ratio of computers to children. To be able to calculate this ratio it was necessary to ask for school size.

Section 2 collects information about the school's ICT inventory and aims to determine the required level of technical support. Computers were grouped by make and operating system thus allowing comparisons to be made between the number of old and new machines. Also requested were details of software packages used and any limitations found in choice. Schools were asked to indicate whether they had an internet connection and if so which service provider they used. They were also asked to give examples of websites visited specifically for help with problems. Questions regarding computer purchase asked for suppliers to be indicated by means of options with check boxes and the source(s) of funds utilised for these purchases. A table was presented for schools to indicate the various sources of government funding they used and for which purchase.

This information might be useful in indicating schools that were possibly unaware of funds available to them.

Section 3 investigates computer support provision such as maintenance contracts, location of the support provider, details of response times and associated problems. Also asked for were details regarding the ICT co-ordinator's job, alternative sources of support available to them and examples of their latest problems. This information helps to create a picture of the technical support issues faced by the school and how they are dealt with.

Section 4 comprises open format questions about technical support available in the local area and asks for suggestions about how support could be better provided for them as individuals. Information asked for in this section was described as *vital to the project.* The intention was to establish schools' satisfaction with the local technical support provision and to identify possible alternatives they might consider to provide a solution to the problem.

The questionnaire was trialled first with three schools and two teaching colleagues to test for accuracy and validity. This was necessary to check questions were clear, unambiguous and designed to minimise possible errors in order to ensure the replies contained appropriate information. Where lists of suggested answers were offered a further option of 'Other' was added, with space for a description, to allow for possible oversights. As outlined earlier, a covering letter was sent with each questionnaire specifying a return by date and the promise of confidentiality. Chase up letters were sent to non-respondents a week or two after the closing date encouraging them to take advantage of the extended deadline as they had expressed a wish to participate in the survey. A further incentive, this time, was the inclusion of a reply paid envelope.

3.7 Case Studies

Schools were selected as case studies from their response to a question on the questionnaire. A tick box was included asking schools if they would take part in follow

up interviews, either with a visit or on the telephone. Twenty one schools agreed to take part in the case studies with fifteen preferring telephone interviews and seven agreeing to visits (one school selected both). Although telephone interviewing is a convenient process for gathering information it is associated with market research and therefore may not yield the responses required. This method was dismissed on the grounds that teachers are very busy, may not be able to leave the classroom and might not entertain a long serious conversation during the working day. Conversely an interview can be more time consuming, requiring travel to the school, but it is easier to get opinions and impressions and have the opportunity to probe deeper or ask follow-up questions when time is not so critical. An added advantage with visits is they enable observation.

Schools agreeing to participate in the case studies were contacted by letter during November 2001 notifying them of a forthcoming phone call to arrange a suitable time and place for the interview. Six of the seven schools specifying a preference for a visit were successfully contacted and appointments organised for the following week. A confirmation letter was sent to them with a copy of their completed questionnaire for reference.

Questionnaire responses from the case study schools were extracted from the original SPSS file and stored separately. This information was used to help formulate topic areas to be covered in the interviews. The following subject areas were decided upon: Technical support, Equipment situation, Software Support, ICT Co-ordinator, Current problems and solutions, Training and Inset days. Questions were spaced out on an A4 sheet allowing room to record answers during the interview with supplementary, relevant information to be written on an accompanying notepad.

Visits took place during December 2001 and March 2002 at times convenient to the ICT co-ordinator. The time and day chosen was completely dependent on the teachers' availability. Four of the case studies were conducted during the build up to Christmas celebrations (one in late November and three in December) so their time was at an absolute premium. In schools where the head or deputy head perform the role of ICT co-ordinator and have non-contact time, their availability was more flexible. It was harder for the teachers to organise free time so meetings took place either at break/lunch

times or during class. Co-ordinating visits was also hampered by the festive season and school Nativity productions. The remaining two case studies were conducted during early March; one interview took place first thing in the morning and the other (in a very small school of 4 staff) at lunch time.

Interviews were conducted using a semi-structured technique with the predetermined list of questions. This list provided a structure for collecting required information but also allowed flexibility to incorporate questions and answers associated with the topics. All responses were recorded manually on the question sheet with extra information noted separately. Answers were then transferred to a word-processed document as soon as possible so that details were not forgotten. Analysis of the results can be found in Chapter 6.

Chapter 4

QUESTIONNAIRE

4.1 Formulation of research questions

The questionnaire was designed to contain questions that would identify the range of technical support required by a primary school. The information given would also help to determine what factors might influence the quality of support provided. Anecdotal evidence from teaching acquaintances had indicated a general dissatisfaction with the technical support being provided to their schools. Although telephone calls for technical help were being answered quickly and handled efficiently, the time taken to fix a problem was becoming unacceptable. Stories of equipment gone missing or engineers not being able to visit the school for days or weeks, were not unheard of. These circumstances were not conducive to teachers planning to use computers for teaching. The literature identifies similar scenarios and also points to other factors such as the inexperience of the ICT co-ordinator and the lack of time available to handle technical problems during the school day. Funding for technical support also has to be provided from school budgets.

The main questions to be considered were based around establishing what infrastructure, hardware, software and internet access was available to the schools. Examples of problems were asked for and details of the school's experience with the support provided whilst the problem was being sorted out. To get an appreciation of how aware the schools were of funding available to them, a question was asked about sources of

funding used to buy computers and for the school to indicate whether any government funds had been utilised for equipment and training, such as GEST and NOF.

4.2 Problems experienced in obtaining the results

Over one hundred schools were contacted by telephone. Some of these schools commented on the number of similar questionnaires they had received recently and were unwilling to participate in any others. One hundred and seven questionnaires were sent out and reminder letters were sent to a large number of schools. Thirty seven schools responded. This left a much smaller sample which was determined to be a valid sample in the methodology section. These responses were from schools with a SLA contract so no comparison could be made with alternative support options. Teachers were too busy to complete the questionnaires and there were no resources to offer incentives.
Only six schools from Carmarthen replied which was disappointing because their responses could have been used to compare two LEA support providers. The schools who did respond are in a similar position to the schools in Swansea. They all use the LEA for their technical support provision. The major difference is that Carmarthen covers a large rural area and because of this broadband may not be possible as a facility.

In reviewing the results some of the answers were ambiguous even though the question seemed clear. Respondents probably needed a clearer definition of technical support against which to answer the questions. This chapter contains the information returned on the questionnaires, a copy the questionnaire can be found in Appendix B. Answers were coded where possible and entered into the statistical package SPSS for analysis in Chapter 5.

4.3 Section 1: School Details

This section contains details about the school such as name, address, phone number, names of head and ICT co-ordinator. A confidentiality promise was made at the top of the questionnaire and in the covering letter, so these details are for contact purposes only. Other details requested were school size and type, name of their Local Education

Authority and a tick box for indicating an interest in taking part in the case studies either by phone or with a visit.

4.3.1 School Size

Schools range in size from the smallest at 27 to the largest at 400, with an average of 187. Seven schools have less than 100 children.

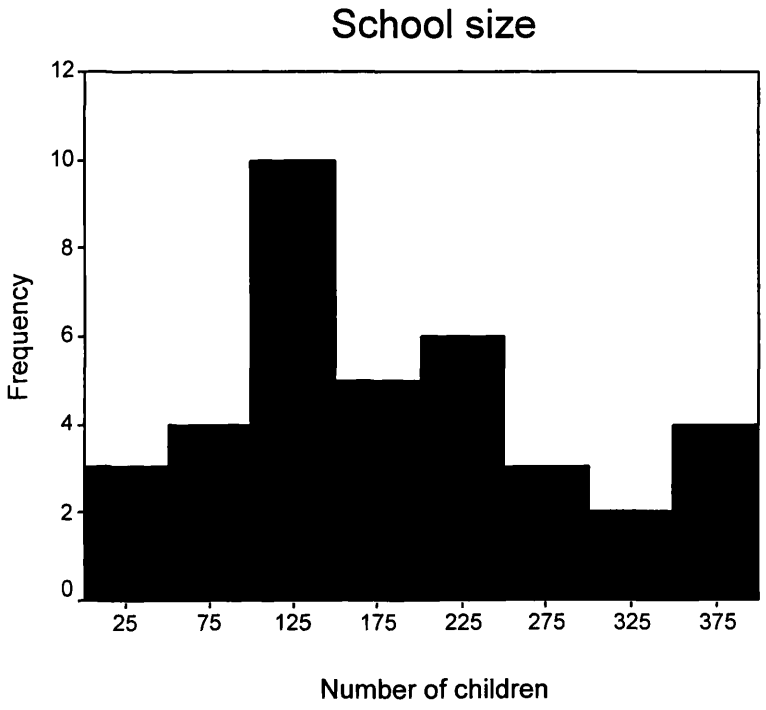

Figure 4:1 School Sizes

Twenty seven schools entered their Special Education Needs (SEN) percentages, these ranged from the lowest at 0.83% to the highest at 40% with an average 20%.

Free school meal percentages were entered by 28 schools and these ranged from 3.3% to 75% with an average 28.8%.

SEN% and Free School Meals figures were asked for as a guide to the level of parents' wealth and therefore their ability to help purchase equipment for school. This information has not been used in the analysis.

4.3.2 Type of School and Local Education Authority

COUNTY	TOTAL SCHOOLS	LEA CONTROLLED	VOLUNTARY AIDED
Swansea	20	19	1
Neath Port Talbot	11	10	1
Carmarthen	6	6	
Total	37	35	2

Table 4:1 Type of School and Education Authority

4.3.3 Case Study Inclusion

Interest in the follow up case studies produced 15 schools agreeing to be interviewed during a visit and 7 prepared to take part in a telephone interview.

4.4 Section 2: Equipment and Usage

Q2.1 What computer equipment does the school have – please add others to the list: (do not include machines used solely for administration purposes).

Table 4.2 lists computer equipment currently found in schools. Spaces were left for schools to enter machine types not included in the list, such as Windows 2000 and laptops, which were added by some schools:

Collective results are shown below:

OPERATING SYSTEM	TOTAL
Windows PC 95/98	269
Acorn RISCOS	237
Windows PC NT	47
Windows 2000	22
BBC	21
Acorn RISCPC	15
Windows PC Q3.1	14
Laptop	7

Table 4:2 Equipment Results

Total computers available in each school ranged from the lowest at 3 to the highest at 40 with an average of 18 across the respondents. This figure combines new and old machines, however further analysis is conducted in Chapter 5 regarding the balance of new and old computers.

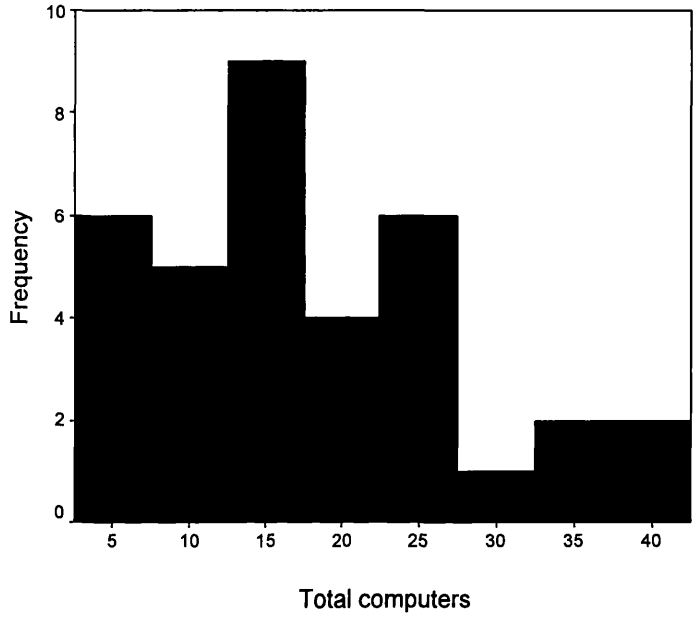

Figure 4:2 Total Number of Computers

Q2.2 What are your 3 most commonly used peripherals:
(e.g. printer, scanner, digital camera)

The three most commonly used peripherals in schools are categorised below:

PERIPHERAL	TOTAL
Printer	37
Digital Camera	27
Scanner	26

Table 4:3 Commonly Used Peripherals

Other equipment, mentioned once each, included Robotic control and a Logit monitor.

Q2.3 Does the school have SEN computer equipment?
(If Yes please give examples):

ANSWER	TOTAL
Yes	21
No	15
Blank	1

Table 4:4 SEN Equipment

Schools were asked to list equipment specifically for SEN and these are the examples:

- Acorn computers and PCs specifically for SEN
- Deaf units
- Blind units
- Ball mouse/easyball mouse
- Large mouse
- Concept keyboard
- Touch screen
- Software

The information from this question was collected with the intention of investigating the possibility that SEN equipment may take longer to repair as it is specialised. This could be an added problem for technical support but no further analysis was actually carried out.

Q2.4 What 5 software packages do your teachers use most?
(e.g. word processor, spreadsheet, drawing):

Schools were asked to list the five most used software packages although not all schools filled all five spaces. The results were coded into groups and counted as follows:

SOFTWARE USED	TOTALS
Graphics/Drawing	39
Word Processing	24
Desk Top Publishing	21
Database	20
Modelling/Simulation	16
Other	16
Spreadsheet	15
Control/Monitor	6
Welsh Programs	2

Table 4:5 Software Used

Software grouped as Other comprised the following:

CD ROMs
DK maths, science
Now & Then
CD ROM games
Literacy/Numeracy
Talking books
Encarta
Explorapedia
Information workshop
Notate(music)
Re-enforcement
Story package
Maths workshop

Q2.5 Is your choice of software limited by any of the following constraints: (please tick all that apply) :

Software choice was limited for the following reasons:

REASON	TOTAL
Cost too high	25
No budget	7
No suitable software	7
Lack of training	4
Not supported by LEA	3

Table 4:6 Software Choice

Under the choice labelled 'Other', three schools specifically mentioned a lack of Welsh software and one wrote down 'software licences for multiple use'.

Q2.6 Does the school have an Internet link?

The question regarding schools being connected to the internet gave the following results:

INTERNET CONNECTION	TOTAL
Yes	29
No	3
Soon	4
No answer	1

Table 4:7 Internet Connection

Q2.7 Which Internet Service Provider do you use?

Responses to this question showed a possible misunderstanding as some schools use the technical support centre for their Internet Service Provider, and the centre themselves use NTL. Results were as follows:

ISP	TOTAL
NTL	15
No answer	9 (5 of which are not yet connected)
LEA	7
Netscape	4
Dialnet	1
N/A	1

Table 4:8 Internet Service Providers

Q2.8 Do you visit any Internet sites for help with software or hardware problems? Please specify:

This question explores how many schools utilise the internet for help with problems. Space was provided to specify the site(s) used although none were noted.

ANSWER	TOTAL	CONNECTED
No	18	Yes
LEA	4	Yes
n/a	3	No
Not yet	2	Yes

Table 4:9 Number of Schools Using Internet for Problem Solving

Q2.9 Where have you purchased your computer equipment from : (Please tick all that apply and state name(s) alongside)

Computers were purchased from the following sources, which are not mutually exclusive:

SOURCE	TOTAL
Local LEA	36
Voucher Scheme	23 (10 unspecified, 13 Tesco)
Local Supplier	8
Other	4 (competition, 2 donations, industry)
Second Hand	3
National Supplier	1

Table 4:10 Equipment Purchase Source

Q2.10 Were any special deals included with equipment purchase e.g. on-site maintenance beyond warranty period, training days, telephone support?

When asked if special deals were included with the purchase of equipment; 11 schools gave no answer, 7 said 'No', 3 said 'Yes' and the remaining schools responded with the following:

N/A
3 year on-site warranty
All in support with SLA
Equipment only contract
Maintenance contract
Repair contract
Link to authority
On-site visits, training and telephone support
On site warranty
Out of warranty support
SLA contract (2)
Training and telephone support (2)
Training days (2)

Q2.11 What source of funding do you use for purchasing computer equipment? (please tick all that apply)

Funding for equipment purchase came from the following sources:

(not mutually exclusive)

SOURCE	TOTAL
School budget	34
School/PTA fundraising	27
Government fund	19
Other:	15
LEA	9

Table 4:11 Sources of Funding

Other sources comprising:	TOTAL
GEST	4
Tesco	2
Donations	2
Local industry	2
Voucher Scheme	1
Gifts & prizes	1
Ford Trust Grant	1
Selar fund	1
NDC & local council	1

Table 4:12 Other Sources of Funding

Q2.12 Does the school receive funding particularly for ICT e.g. NOF, GEST? (please specify source of fund and tick the relevant column for use of money):

Funding specifically for ICT was received from the following sources:

SOURCE	TOTAL
NOF and GEST	24
GEST	5
None	2
No answer	1
NOF	1
NOF, GEST and Government	1
NOF, GEST and NGfL	1
NOF, GEST and TILT	1
NOF, GEST, After School Club, Nursery Fund	1

Table 4:13 ICT Funding Sources

4.5 Section 3: Computer Support Provision

Q3.1 Is there a set procedure that teachers follow when there is a problem with computer hardware or software?

RESPONSE	TOTAL
Yes	33
No	4

Table 4:14 Problem Procedures

Q3.2 Please outline the initial steps a teacher would take to solve the problem :

What is the procedure for help, who do they ask.

POINT OF CONTACT	TOTAL
ICT co-ordinator	24
Technical Support Provider	5
Self	4
Head	3
No answer	1

Table 4:15 First Point of Contact for a Problem

Q3.3 Does the school have support/maintenance contracts for its computer equipment with any of the following? *(please tick all that apply):*

All 37 schools use the LEA Service Level Agreement for their support provision, one school also uses a local computer supplier and 2 schools also use the hardware supplier. Six of the schools are under the Carmarthenshire Local Education Authority, with their SLA contracts provided by the County Council and the remaining 31 schools from Swansea and Neath Port Talbot using the Technical Support Centre based in Port Talbot.

Q3.4 What does the contract include? *(please tick all that apply):*

Options with tick boxes were listed. A box for 'other' allowed space for a description.

INCLUDES	TOTAL YES	TOTAL NO
Extended warranty	9	28
School site visits	37	
Removal of equipment for repair	36	1
Telephone support/helpline	36	1
Other (advice and discounts)	1	

Table 4:16 Type of Contract

Q3.5 How far away is the support provider and is it a problem? *(Examples please):*

Schools were asked to comment on how far away the technical support provider was based and whether this was a problem. 20 of the 37 schools answered this question with the actual distance giving a minimum of half a mile and maximum of 20 miles. A table containing the full details is found in Appendix D.1.

Where a description was used in place of a measure the following remarks were noted:

- close to school
- Swansea to Baglan
- few miles
- 30 minutes
- local
- Trallwn to Baglan
- Upper Killay to Baglan
- Port Talbot to Baglan
- Penlan to Baglan
- Ammanford to Newcastle Emlyn

Results for whether distance is a problem gave the following:

RESPONSE	TOTAL
No	24
Yes	4
Sometimes	3
No answer	6

Table 4:17 Is Distance a Problem?

Q3.6 With a maintenance call-out what is the usual response time for resolving a problem? *(please give some examples below):*

Response times were coded into the following table. A full list of actual responses can be found in Appendix D.2 with the allocated coding.

CODED RESPONSE	TOTAL
Day	3
Days	13
Week	4
Weeks	11
Months	2
Variable	4

Table 4:18 Maintenance Response Times

Some schools included a description of their experiences with the technical support provider and how they view the service offered. These comments have been grouped into a table by the response time given.

RESPONSE TIME	DESCRIPTIONS
DAY	Quick removal
	Quite soon
	Some delays in support when excessive demand
DAYS	Depends on problem
	Good for progress reports
	If busy can be a week plus or forgotten
	Often don't come for several days
	On site fix in 1 week, off site takes longer
	Response time worse than distance
WEEK	They visit the school
WEEKS	1 week to visit and 2 weeks to repair
	Centre are supportive
	Broken printer with no response for 2 weeks
	Depends on urgency
	Difficult to say
	Quick response but repairs take weeks
	Response time a problem
	Varies from week to fortnight
MONTHS	Getting better but wrong equipment sent back
VARIABLE	Depends on availability of parts
	Takes longer to respond lately
	Variable if busy
	Varies with workload

Table 4:19 Resolution Time

The following table shows the number of schools in each authority by the length of time taken for a problem to be completed.

TIMESCALE	SWANSEA	NEATH PORT TALBOT	CARMARTHEN
Day	2	1	
Days	6	4	3
Week	1	1	2
Weeks	8	2	1
Months	1	1	
Variable	2	2	

Table 4:20 Resolution Time by LEA

Q3.7 If the school has no maintenance contract for a piece of computer equipment what options are there for having it repaired/replaced? *(please give examples below):*

Even though all schools in the survey are supported by Service Level Agreements, some still responded to the question regarding options for alternative repairs. Given that not all equipment is bought through the SLA other cover is sometimes required. Schools were asked to give examples of where they might go for repairs if they had no maintenance contract.

N/A was the answer from 19 schools, 2 put the LEA, 3 said a local supplier and one would make an insurance claim. Considering all schools that answered the questionnaire have a service level agreement with their LEA, the responses here would have shown whether the schools knew of any alternative to the support they already have.

Q3.8 Does your school have support for any of its software packages?

To build a more comprehensive picture of support, questions were asked specifically about software and whether there was support available for the use of packages, for example telephone support, e-mail support or none at all. Two schools were unsure of their situation so are not included in the totals. Answers are not mutually exclusive and are shown in the following table:

TYPE	TOTAL
None	13
Telephone	32
e-mail	13
Site visit	24

Table 4:21 Software Support

Q3.9 With the software support contract what is the usual response rate for a call with a problem*? (please give some examples):*

The following table shows the frequency of coded responses.

TIME	TOTAL
Immediate on phone	5
Days	4
Weeks	2
Variable	4
N/A	22

Table 4:22 Resolution Time

Q3.10 About the ICT co-ordinator.

These questions about the ICT co-ordinator's job were to determine the extent of their duties and highlight any problems regarding their time allowance and availability. These are the responses received:

ICT JOB	NO	YES	NO ANSWER
Full time	18	8	10
Extra responsibility	2	34	1
Easily released	28	5	4
Time allowance	26	6	5

Table 4:23 ICT Co-ordinators Availability

Q3.11 Do the ICT co-ordinator's duties include technical support and to what extent?

To establish the extent to which ICT co-ordinators' duties included technical support an open ended question was asked and the responses are shown in Appendix D. The answers were categorised as follows:

No - if no technical support was expected

Yes - if they were responsible for sorting out problems before contacting the support provider

Basic/limited - for those that could set up a new system, install software and deal with simple problems

INSET - if they were expected to run training courses for the staff

This table shows the frequency of each answer:

ANSWER	TOTAL
Yes	13
Basic/limited	12
No	9
INSET	2
Blank	1

Table 4:24 Do ICT Co-ordinator's Duties Include Technical Support?

Q3.12 Does the school use AOTs (adults other than teachers) specifically for ICT help? Please specify *(e.g. learning support assistants, teacher's aids, parents)* :

Answers were coded as shown in the table below:

ANSWER	TOTAL
No	18
Yes	16
Considering	1
Not specifically	1
Blank	1

Table 4:25 Adults and Teachers

The 16 schools answering 'yes' to using AOTs listed the following type(s) available to them:

AOT TITLE	TOTAL
Learning Support Assistant	8
LSA and NNEB	2
LSA and parent	1
LSA, CA and parent	1
Class Assistant	1
Teaching Assistant	1
Parent	1
SEN aid	1

Table 4:26 AOTs Available to Schools

Grouping like titles together gives the following totals:

TITLE	TOTAL
Learning Support Assistant	11
Parent	3
Class Assistant	2
NNEB	2
Teaching Assistant	1
SEN aid	1

Table 4:27 AOTs Available to schools Coded.

Of the 18 schools that said no to using AOTs for ICT help, one is considering employing one of their LSAs specifically as an ICT supporter and another uses AOTs for other duties in the school.

Q3.13 If the school has no support contracts and the ICT co-ordinator cannot solve the problem, where do you go for help? *(e.g. parent governor, expert pupil, another school's technician) :*

An open question was used to establish if schools used other sources for help if they did not have a support contract. Although all schools are covered by a contract only 18

schools answered N/A. 10 schools made no comment and the remaining 9 gave the following answers:

ANSWER	TOTAL
Support Centre	4
Parent	3
Another school	1
County Technician	1

Table 4:28 Support Sources

The four schools naming the Support Centre as an alternative source of support actually have a SLA agreement with them, so this figure is void. This could also be true for the county technician. These answers do not indicate there is an alternative technical support provider that could compete with the LEA provision already being used by all sample schools.

Q3.14 What are the 3 most recent computer related problems from the last 3 months?

PROBLEM	TOTAL
Internet/e-mail	25
Printer	22
Freezing/Crashing	11
Network/Server	7
Monitor	6
Software	5
CD	3
Scanner	2
Virus	2
Keyboard	1
Hard Drive	1
Mouse	1
Sound	1
Digital Camera	1
Laptop	1

Table 4:29 Problems

Q3.15 If a computer or printer is out of use does the school have a contingency plan? *(e.g. spare resources, replacement agreement with supplier etc.)*

Answers are categorised in the following table:

PLAN	TOTAL
No	17
Spare resources	6
Share resources	3
Spare printers	2
Share printers	2
Spare computers	2
Share computers	2
Blank	3

Table 4:30 Alternative Resources

4.6 Section 4: Open Format Questions

Q4.1 Do you think there is enough local affordable support to meet the needs for curriculum requirement ?

An open question was asked to determine if schools thought there was enough local affordable support to meet the needs of ICT in the curriculum. Answers were coded as follows:

ANSWER	TOTAL
No	16
Yes	11
No direct answer	8
Blank	2

Table 4:31 Enough Affordable Support?

Some schools gave comments which are listed below:

- Would like a centre like the Support Centre based in Swansea
- The Support Centre are good and give advice on curriculum
- All support supplied by The Support Centre
- Financial constraints for site licences
- The Support Centre is too far and support needed quickly
- Only through The Support Centre
- Need for more support and quicker response
- Schools need access to support weekly
- The Support Centre
- But will there ever be?
- Problems supporting school networks with this SLA
- Local pressures cause variations in supply
- Not matter of affordable but priority for budget
- The Support Centre provide good service but are busy and slow
- No choice
- SLA with The Support Centre meets most demands
- All relative, small school, small budget
- Only 3 teachers and no-one expert in ICT
- Need computer suite, use local college/library?
- Local probably, affordable relative to budget
- Good wide range support from SLA

Grouping the schools by LEA region the following results were found:

ANSWER	SWANSEA	NEATH PORT TALBOT	CARMARTHEN
No	10	3	3
Yes	6	3	2
No direct answer	3	4	1
Blank	1	1	

Table 4:32 Enough Affordable Support?

Q4.2 Do you know of any other support services available in the area?

The following results were collected:

ANSWER	TOTAL
No	20
Yes	10
Blank	7

Table 4:33 Knowledge of Other Support Services

Schools were also asked for names of alternative technical support providers available. Four schools answered this even though they answered 'no' to knowing about other technical support providers. These are the comments they made:

- Apart from local shop
- Commercial stores – PC World, Comet
- Except from private sector
- None which are affordable

The ten schools that answered yes to knowing of alternative support gave the following answers:

- Can be expensive
- CTS Llandarcy but no curricular support
- Local companies but no confidence to move
- Local corner shops
- PC World
- PC World for businesses
- Private companies for leasing
- Private firms
- Various firms

Q4.3 Ideally how would your school like to be supported?

An open ended question was asked to establish how schools thought they would like to be supported. The following lists show the responses given by the schools grouped by LEA:

Swansea:

- As The Support Centre but faster service - more staff required
- By a strong well run county supported service at The Support Centre
- Centre close by, curriculum support, meet to share info
- Cheapest option
- Financially - site licences expensive
- Flexible, available technician to help out when needed
- Full-time technician
- Full-time ICT teacher giving classes in networked room
- Fully trained cluster support technician to share
- Funding for IT room
- Next day callout and more on-site training
- On-site S/W and H/W support
- On-site technician
- Quick response time from The Support Centre, Acorn technicians
- Regular weekly technician visit
- Shared school technician with weekly visits
- SLA technical and curriculum support
- Through The Support Centre with increased technical support
- Trouble shooting visits, advice sessions, faster repairs

Neath Port Talbot:

- An effective fully managed service
- Divide The Support Centre up into clusters with area managers
- Employ ICT technician for simple problems
- Fortnightly visit by technical officer for problems/repairs
- INSET days at IT centre for training in weak areas
- More funding but not at expense of other areas
- Prompt response to callouts
- Quickly, effectively, cheaply
- Repair workshop on site, H/W & S/W support and advice
- Technician assigned to school available immediately
- Via The Support Centre but support to meet user needs not provider

Carmarthen:

- As now but more hands on support, courses on internet/web
- Extension for computer suite or touch screen for each class
- In school support for individual needs
- INSET training with expert on ICT in curriculum
- Satisfied with current support
- Similar to now but more staff for the higher demand

Q4.4 What are your plans for ICT development for the coming year?

- NOF training, improve curriculum ICT
- 7 new PCs, NOF training, TILT training
- Buy more PCs - only 8 for 30 pupils in room
- Buy new PCs for remaining classes
- Buy PC, printer, scanner, camera, develop Internet
- children learn e-mail, web site, schools conference
- Complete NOF training, TILT
- Completing LSP and buy new computer
- Computer suite 15 PCs, increase internet use
- Develop school web site
- Develop web site, buy another computer
- Employ ICT, Web site, improve skills and hardware
- Fully operational network room for curriculum development
- Have 16 new computers, may install network
- ICT across curriculum in classroom, control technology
- ICT suite networked to classrooms + full SLA
- ICT suite, link to Europe, website
- Laptops for class use
- Link to internet
- Network room in library, buy better printers
- Network teaching room, buy software
- NGfL training
- NOF + SW courses at The Support Centre, IT scheme of work,
- NOF for internet
- NOF training, website, Becta laptop activities
- NOF, NGFL
- Ongoing NOF training
- PCs for infants, promote cross curriculum use
- replace A7000s with PCs
- replace Acorns with PCs, ICT area with whiteboard
- Replace old PCs, internet access, NOF
- Scanner, digital camera, finish NOF
- Use IT suite to develop skills
- web page, digital camera, buy computer + web cam
- Write new scheme of work for curriculum 2000

Chapter 5

DATA ANALYSIS

All schools in Swansea, Neath and Port Talbot were targeted with the questionnaire, and approximately a third of Carmarthen schools. From a total of 107 schools contacted, thirty seven responses were received, giving a sample size of 37. As established in Chapter 3, this gives more than the required minimum sample size for statistical analysis. This chapter analyses the data collected in Chapter 4 and presents the results as absolute values as this is more meaningful considering the sample size, although percentages have been calculated where necessary for comparisons.

As previously described in Chapter 3, the questionnaire was grouped into subject areas to identify possible deficiencies within the support provision. These subject areas focused on equipment and software usage, problems with hardware and software, technical support from the LEA supplier and how schools utilised their own resources for resolving problems. In addition, questions were asked to identify sources of funding and whether the schools knew of any alternative support that they could use.

5.1 Equipment and Software

5.1.1 Equipment

The following table shows figures collected from the questionnaires:

OPERATING SYSTEM	TOTAL
Windows PC 95/98	269
Acorn RISCOS	237
Windows PC NT	47
Windows 2000	22
BBC	21
Acorn RISCPC	15
Windows PC 3.1	14
Laptop	7

Table 5:1 Computer Operating Systems

This table indicates that a large number of old computer operating systems, namely Acorn and BBC, are in use within these primary schools. Computers of this type will become increasingly harder to find support for, both in terms of troubleshooting advice and access to application software. Noticeably Windows 2000, the latest operating system at the time, is poorly represented in the list.

5.1.2 Age of Equipment

Research commissioned by the Liberal Democrats (2001) identified that schools struggle to keep up with changing technology and were increasingly stuck with outdated equipment. Their report stated: "Forty-four per cent of primary schools have computers which are more than three years old; 18 per cent of primary schools have computers which are more than five years old." This is significant because older machines will either need to be upgraded or replaced to allow access to the NGfL via the internet.

In this study only four schools, of the thirty seven replying to the questionnaire, have no old computers at all. Two schools did not provide any figures, this leaves thirty one schools (84%) still using old equipment. The table below illustrates the equipment situation within those schools surveyed.

Schools with a greater number of old computers	9
Schools with a greater number of new computers	25
Schools with equal numbers of each	1
Schools not giving the relevant information	2

Table 5:2 Comparisons between New and Old Computers

Nine schools within the sample have a greater number of old computers. These older computers will be more likely to require maintenance which could be costly at best but impossible to repair at worst. In view of this, the situation with older computers was investigated further in the case studies in Chapter 6. Incidentally, 25 schools have a relatively greater number of new computers which are more likely to require less maintenance and their specification would possibly allow them to be connected to the internet putting them in a better position for achieving this government target.

5.1.3 Ratio of Computers

As referred to in the literature, the ratio of computers to children is often used as a measure of the schools' ability to achieve the government's targets as published by the DfES (Department for Education and Skills) and BESA (the British Educational Suppliers Association). The following paragraphs analyse the data to determine whether or not the computer to pupil ratio is similar to research from England and Wales. There are numerous reports available documenting the situation of computers in schools, as discussed in Chapter 2, but the majority are based on schools in England and not in Wales. The NGfL baseline indicates that computer to pupil ratios for teaching and learning purposes should be at least 1:11 in primary schools in 2002. The trend in England is illustrated in the following table compiled from the annual DfES reports "Survey of Information and Communications Technology in Schools" (DfES, 2001). This data comprises computers mainly used for teaching and learning in schools in 2001 and is therefore equivalent to the data collected in the questionnaires. The figure for 2002 is a projected estimate.

	1998	1999	2000	2001	2002
Average number of computers per school	13.3	16.1	17.8	20.7	31.0
Average number of pupils per computer	17.6	13.4	12.6	11.8	9.7

Table 5:3 Ratio of children to computers

The average number of computers per primary school in England has increased steadily between 1998 and 2001 and there has been a corresponding decrease in the number of pupils per computer. Analysis of the questionnaire data collected in 2001, gives an average of 18 computers per school and ratios of children to computers as ranging from 3.56 to 25 with an average ratio of 11.1 as shown in the figure below. This demonstrates the results collected from the sample in South Wales are not dissimilar to those collected in England and direct comparisons thus might be possible.

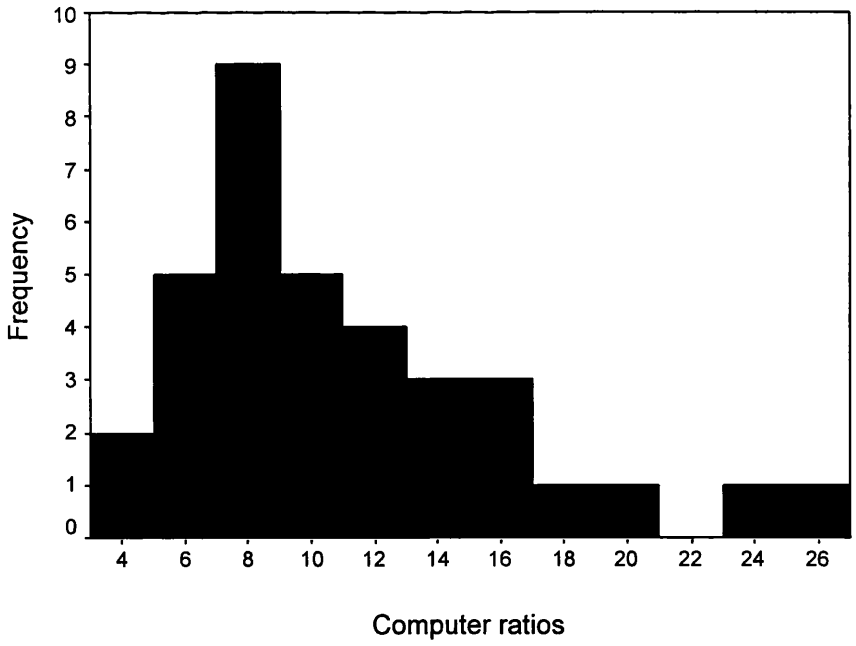

Figure 5:1 Computer Ratios

5.1.4 Software

Schools were asked to list the five software packages most used by teachers. Answers were coded and the results grouped as follows:

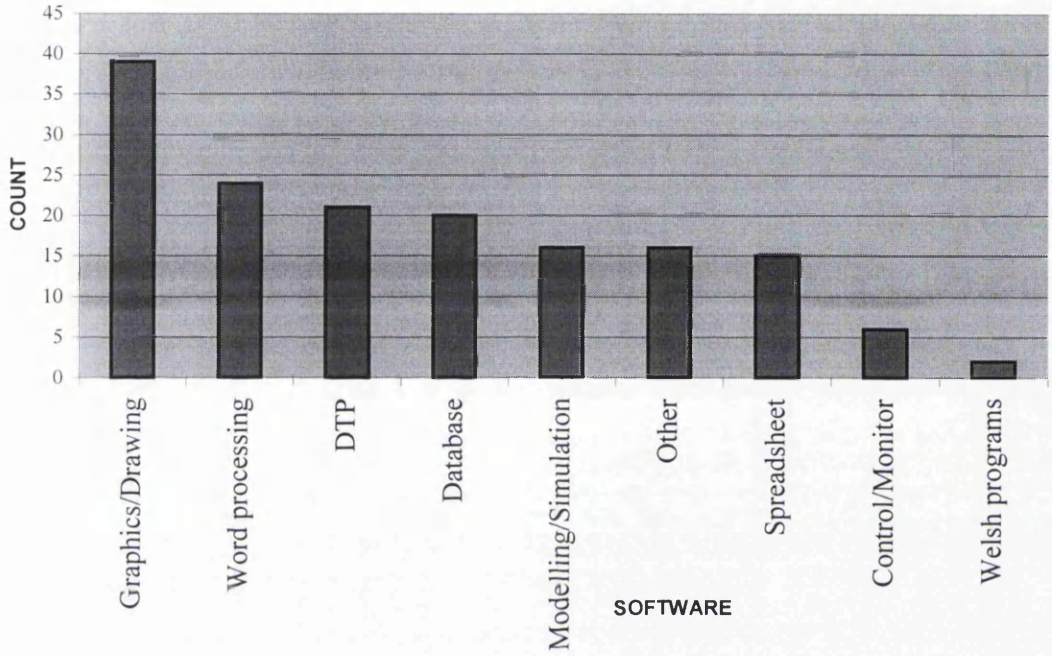

Figure 5:2 Software in Use

There is a wide variety of software used by the schools, the most common being graphics and drawing packages. Welsh software has a very small user base but this could be due to the cost or availability. Further analysis of the software situation in schools is detailed in Section 5.3.4.

5.1.5 Internet

From the questionnaire data there are twenty nine (78%) schools connected to the internet compared to four (11%) who are soon to be connected and three (8%) who are not connected, one school did not answer the question. Combining the counts of schools

already connected with those soon to be connected, the ratio is 89%. The obvious question is how this percentage compares to the national average.

Two survey results will allow us to make a comparison. The DfES Statistical Bulletin Survey of Information and Communications Technology in Schools (DfEE, 2000), provides figures for England and the BESA 'ICT in UK State Schools Survey 2000'(BESA, 2000) which includes Wales, Scotland and Northern Ireland, as well as England.

Percentage of schools	1998	1999	2000	2001
DfES Study	17%	62%	86%	96%
BESA Study	34%	58%	88%	98%
This Study				89%

Table 5:4 Percentage of Schools Connected to the Internet

This shows substantial progress is being made towards achieving the Government's target for every school to have access to the Internet.

The government target that every school will be connected to the internet by 2002 seems achievable from these figures, but are they giving a true picture. One computer in a secretary's office connected to the internet is enough to satisfy the government's requirement. Research from the Liberal Democrat's Survey (2001) discussed in the literature review stated that "statistics make no distinction between the various types of Internet connection in terms of quality or speed, and furthermore, makes no difference between whether the school has one Internet computer in the head teacher's office, or an entire suite of Internet computers for pupil use."

Increased use of the internet also has a potential influence on the amount of problems encountered. Chapter 4 Table 4:29 shows that internet problems were mentioned more frequently than any other type. Further information regarding internet use was gathered during the case studies.

When asked if any internet sites were visited for help with software or hardware problems, eighteen schools answered 'no', two said 'not yet', three were 'not applicable as not yet connected', and four said 'they use their LEA'. The rationale behind asking this question was to investigate whether the NGfL was used for curriculum support or to resolve problems. This is a poor result and does not show progress towards achieving the government's target for using the NGfL in teaching and learning.

5.2 Problems

To understand the types of problems schools experience with their hardware or software, they were asked to detail their three most recent problems.

5.2.1 Three Most Recent Problems

To appreciate the types of problems schools experience, answers were grouped into the following categories:

PROBLEM	TOTAL
1. Internet/e-mail	25
2. Printer	22
3. Freezing/Crashing	10
4. Network/Server	7
5. Monitor	5
6. Software	5
7. CD	3
8. Hard Drive	2
9. Scanner	2
10. Virus	2
11. Laptop	2
12. Keyboard	1
13. Mouse	1
14. Sound	1
15. Digital Camera	1

Table 5:5 Most Recent problems

Interpretation of some of these problems was challenging as the descriptions were sometimes ambiguous. The following problems were categorised as shown in the parentheses:

"software freezing" – this could be a system or software fault (3)
"unable to run 2 printers via one switch" – printer or hardware problem (2)
"internet suite crashing" – is this the internet at fault or does suite imply network making it a network fault? (1)
"ICT co-ordinator not being knowledgeable enough" – this is a problem but not with the equipment. (This response has not been categorised).
"Shared system not functioning properly" – is this a network? (4)
"Front end problems" – is this software or internet? (6)
"Problems with A7000s" – unspecified. (3)
"Unable to save work" – software or hardware at fault? (6)
"Internet server down" – which is it? (1)

Although most problems occur with the internet or e-mail, closely followed by printers, looking at the comments made some indicate a lack of experience and therefore an inability to correctly identify the cause of a problem. This is a crucial factor because when calling out an engineer they have to specify whether the problem is hardware or software related. Incorrectly diagnosing the cause of a problem will lead to delays because different technicians will be involved in solving the problems.

Excluded from the totals was one school whose answers could not be categorised. They gave the following three responses:

"Money – we need more of it!"
"Whether to cancel our SLA with the LEA technical support provider"
"New staff members need ICT skills, maybe have a computer at home."

Interestingly, in conjunction with the comments illustrated above, it becomes obvious that problems are not just related to the technical support provider but fall into other

categories such as inexperience, lack of training and shortage of funds. These problems can be overcome by further training for the ICT co-ordinator, funding specifically for maintenance and support or seeking support from alternative sources.

The questionnaire data was further analysed to divide the type of problems by size of school. These results are presented in the figure below. The same types of problems occur within small and large schools. Size of school does not seem to be a factor in influencing the type of problems experienced.

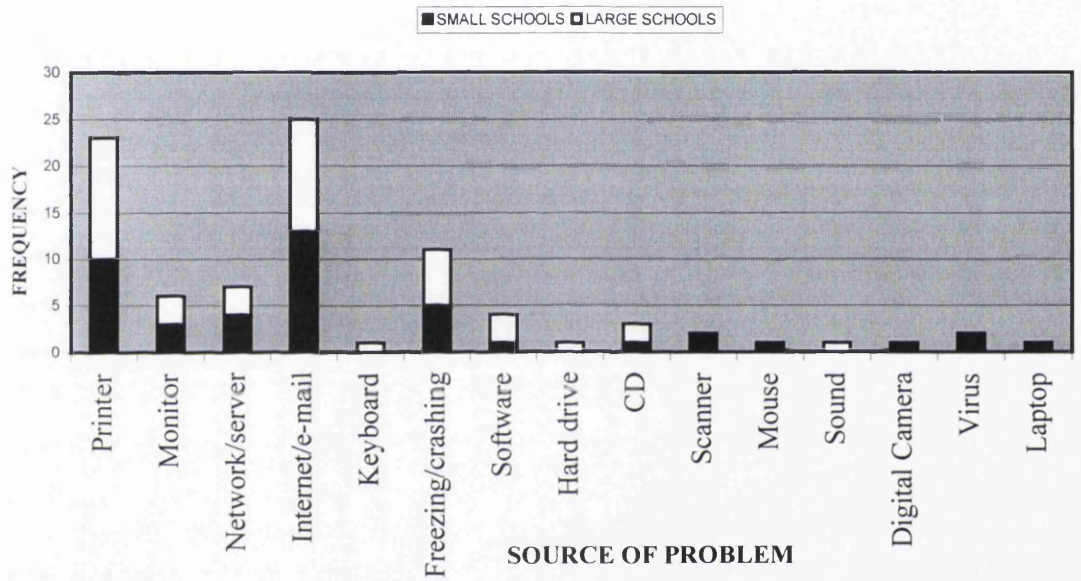

Figure 5:3 Comparison Of Problems

5.3 Technical Support from the LEA provider.

The survey schools within Neath, Swansea, Port Talbot and Carmarthen all use the LEA ICT support provider. This means the LEA support provider takes responsibility for ICT support. This type of approach mirrors the definition of Type B LEAs defined in the Pathfinder Report on the rollout of the NGfL program (Becta/DfES, 2001b). All these schools have a service level agreement but none has a Managed Service agreement. The

local LEA support provider did not offer this at the time of the survey, although they were considering it for the future.

Dissatisfaction with technical support has featured prominently in many surveys discussed in the literature review. Most of these reports talk about technical support in general, but Ofsted (2001) and Becta/DfES (2001b) specifically mention the LEA support provider. These surveys looked at a wide range of issues, but due to restrictions on the type of questions that could be included in the questionnaire, as discussed in Chapter 3, satisfaction with technical support in this research has been measured by responsiveness and whether quality of service is affected by the size of the school and / or the distance from the technical support provider. The Becta Customer Satisfaction Survey (Becta, 2001) asked whether schools were satisfied with the responsiveness of their LEA technical support service. This survey concluded that on a scale of one to five, schools' satisfaction achieved a score of 3.5.

5.3.1 Distance from the Technical Support Provider

Reviewing the questionnaire results for the provision of technical support, all 37 schools have a contract with their Local Education Authority outlined in a Service Level Agreement (SLA). In addition one school uses a local computer supplier and two use the hardware supplier for support. The LEA Technical Support Centre providing the service level agreement for Swansea, Neath and Port Talbot was originally based in one county, West Glamorgan. This has since been split into two separate counties, Swansea and Neath Port Talbot. Subsequently it is now local for some schools but in an adjacent county for others. This has caused some concern over bias for those schools based outside the county, as disclosed by one school during the case studies.

Reference to section 4.3, question 3.5 illustrates that only 20 schools entered a numeric distance on the questionnaire, with answers ranging from half a mile to 20 miles. Others noted the geographic location of the technical support provider, or described the distance with phrases such as "close to school" or "a few miles". In hindsight the physical distance is probably irrelevant as the important information is whether it creates a

problem. The following table shows the total number of schools giving a definite response to the question "Is distance a problem?"

PROBLEM ANSWER	TOTAL
No	24
Yes	4
Sometimes	3
No Answer	6

Table 5:6 Is Distance a Problem

Nearly a fifth of the schools responding stated that distance was a problem. Thirteen of the schools answering 'no' made some significant comments. Two schools stated that "response time was more of a problem" whilst others made the point that they "had an engineer who lives near the school" or that equipment was " taken quickly".
Schools answering 'yes' gave the following descriptions of distance – "10 miles", "next county", "Plasmarl to Baglan" and "too far". Problems described by these schools included: "Often don't come for several days", "Time taken for visits/repair" and "Have to send equipment to them". These comments suggest that resolution time was more of a problem.

Of the schools answering 'sometimes' to distance being a problem, one was situated 18 miles away with a description "It could be a problem", and the other two had similar comments of "Sometimes delays due to excessive demand" and "Depends how busy they are". Schools giving 'No Answer' all entered a distance but no problems were described.

Although the combination of answers from this question prevented distance being used as a measure of customer satisfaction, the comments demonstrated that distance from the technical support provider was a problem for some schools and that resolution time is an issue with some schools, over and above distance. Others recognise that excessive demand has a detrimental effect on response rate. In addition to this factor, school size may also influence the timeliness of ICT support.

5.3.2 Size versus Distance

Further analysis of the data was made to determine whether or not the distance from the technical support provider was perceived as more of a problem for smaller schools than for larger ones. The following table collates the answers given by school size.

	PROBLEM			
SIZE	**Yes**	**No**	**Sometimes**	**No Answer**
Small	1	15		1
Large	3	9	3	5

Table 5:7 School Size Versus Distance is a Problem

The majority answered 'no' and the small school answering 'yes' was referring to the "time taken for visits/repair" over and above the distance involved. Two of the 3 large schools answering 'yes' stated "often don't come for several days" and "have to send equipment to them", neither statement disclosing whether distance was a problem.

To better analyse the responses of schools in relation to their distance from the technical support provider, the actual mileage was necessary.

		DISTANCE	
SIZE	**PROBLEM**	**Near**	**Far**
Small	Yes		1
	No	3	12
	Sometimes		
	No Answer		1
Large	Yes	1	2
	No	6	3
	Sometimes	1	2
	No Answer	4	1

Table 5:8 School Size Versus Distance is a Problem

In each section the predominant answer is 'no' but some of the comments reveal dissatisfaction is not necessarily with the distance but with the resolution times. The small school 'far' from the technical support provider said yes it was a problem but in relation to "time taken for visits/repair". A large school based 'near' answered 'sometimes' with the following comment "sometimes delays due to excessive demand". Two of the large schools 'far' from the technical support provider answering 'yes', responded with "often don't come for several days" and "have to send equipment to them" and two similar schools answering 'no' stated "response time the only problem" and "response time more of a problem". Overall these findings demonstrate that school size in relation to distance from the technical support provider does not have a bearing on the perception of technical support received.

To investigate whether there is a bias between the Swansea and Neath Port Talbot areas, considering the shared support provider, and to determine whether school size influences the opinion of support, the following table was generated from the answers.

By calculating the missing distances, using the school address, it was possible to categorise schools as being 'near' (less than 10 miles from their technical support provider), or 'far'. This measure in conjunction with the size of the school ('small' for less than the average 187 pupils, 'large' when more than the average), produces a table of results shown in Appendix D.1. From that information the following totals were obtained:

LOCATION	SIZE	DISTANCE A PROBLEM				COMMENTS
		YES	NO	SOME-TIMES	N/A	
Swansea	Small	1	4			Equipment taken away quickly. Not a problem.
	Large	3	7	3	2	Not really – engineer lives near school. Response Time is the only problem Local Response Time More of a problem.
Neath Port Talbot	Small		5		1	Not usually. Short Distance.
	Large		2		3	No Major Problem
Carmarthen	Small		6			No problem as they come to the school No problem. No Problem.
	Large					

Table 5:9 Responses by Area

The only schools having problems with responsiveness are in the Swansea area which does not have a dedicated LEA support provider. The larger schools appear to have more of a problem (combining 'yes' with 'sometimes') showing 6 schools experiencing delays.

5.3.3 Maintenance Call-out Resolution Times

Resolution times were coded, as shown in Appendix D.2, and displayed in the following table. Some schools included a description of their experiences with the support provider and how they view the service offered. These comments have been grouped into the table by the response time given.

RESOLUTION TIME	TOTAL	DESCRIPTIONS
DAY	3	Quick removal
		Quite soon
		Some delays in support when excessive demand
DAYS	13	Depends on problem
		Good for progress reports
		If busy can be a week plus or forgotten
		Often don't come for several days
		On site fix in 1 week, off site takes longer
		Response time worse than distance
WEEK	4	They visit the school
WEEKS	11	1 week to visit and 2 weeks to repair
		Centre are supportive
		Broken printer with no response for 2 weeks
		Depends on urgency
		Difficult to say
		Quick response but repairs take weeks
		Response time a problem
		Varies from week to fortnight
MONTHS	2	Getting better but wrong equipment sent back
VARIABLE	4	Depends on availability of parts
		Takes longer to respond lately
		Variable if busy
		Varies with workload

Table 5:10 Maintenance Call Out Response Times

The results in the above table illustrate that more than half the problems take a week or longer to be resolved. The lengthy resolution times are due to the fact that the service level agreement with the service provider varies depending on the type of equipment to be repaired or maintained. For managed service desktop equipment the Service Level agreement states:
"Where installed, managed desktop equipment will be subject to a target of 2 working days to restore normal operation."

It is possible that a lot of the calls could relate to older stand alone equipment which will be difficult to maintain. These will be repaired on a best endeavours basis. Bearing in mind that ICT now forms an important part of the curriculum it is debateable whether these resolution times are satisfactory. For example, seventeen of the schools that responded have stated that resolution times are three weeks or more. This is almost a third of a term and is unacceptable in some situations. This identifies a need for schools to have their own budget for support so that they can negotiate more aggressive response times for critical pieces of equipment. The literature review highlighted that money is available from NGfL for purchase but not technical support. (Becta/DfES, 2001a).

The table above has been further analysed to determine whether or not the school's county has a bearing on response time. Over half the schools in the Swansea area have a poor resolution time of weeks or more.

RESOLUTION TIME	SWANSEA	NEATH PORT TALBOT	CARMARTHEN
Day	2	2	
Days	6	4	3
Week	1	1	2
Weeks	8	2	1
Months	1	1	
Variable	2	2	

Table 5:11 County of School Versus Response Rate

Further analysis was conducted on this information dividing schools into small and large to see how they compare. The majority of schools in both groupings have a response rate between days and weeks. There does not appear to be a noticeable difference between the size of schools and resolution time.

RESOLUTION TIME	TOTAL	
	SMALL	LARGE
Day	1	2
Days	6	7
Week	4	
Weeks	4	7
Months		2
Variable	2	2

Table 5:12 Resolution Times in Small and Large Schools

5.3.4 Software Support

To build a more comprehensive picture of support, questions were asked specifically about software support and whether they were covered for help with use of packages, telephone support, e-mail support or none at all.

ANSWER	TOTAL
Telephone Support	32
Site visit	24
e-mail support	13
no support	13

Table 5:13 Help with software support

Schools were also asked about the resolution time for software calls. The following table shows the frequency of coded responses.

RESOLUTION TIME	TOTAL
Immediate on phone	5
Days	4
Weeks	2
Variable	4
No answer	19
N/A	3

Table 5:14 Resolution times for software problems

In section 5.1.4, the survey identified a wide range of software being used by schools. The table above shows that over half the schools provided an answer for resolution time. The variable time depended on how busy the technical support provider was. Of those that did respond more than half the calls took days to answer. From the analysis of the three most recent computer related problems, described in Section 4.5:Q3.14, only five were software related. Considering this information and details from the analysis, software support does not appear to be as much of an issue as hardware support.

5.4 Internal Technical Support

Section 5.2 concluded that resolving computer problems in schools is often hampered by inexperience and lack of training. Some of these problems could be handled by the ICT co-ordinator and Adults other than Teachers (AOT) with the right training. Their roles are examined in this section.

5.4.1 ICT co-ordinator job details and extent of technical support

Questions were asked about the ICT co-ordinator's job to determine the extent of their duties and highlight any problems regarding their time allowance and availability.

ANSWER	FULL TIME	EXTRA	RELEASE	ALLOWANCE
No	18	2	28	26
Yes	9	34	5	6
No answer	10	1	4	5

Table 5:15 ICT Co-ordinators Duties

Of the nine schools answering 'yes' to full-time, on further examination eight had said the ICT co-ordinator's job was a full time post but also an extra responsibility for a teacher. These questions were intended to be mutually exclusive. A possible explanation is that in primary schools the ICT co-ordinator's job is usually an extra responsibility and not a full-time position, although the expected duties could make it appear as such. That leaves only one school declaring the ICT co-ordinator's job as full-time and not an extra responsibility.

Thirty four schools have the role as an extra responsibility. In order to fulfil this role it is essential for ICT co-ordinators to be released from class when necessary. Significantly 28 schools say they could not easily be released from class to perform their duties and 26 do not have a time allowance. The Department for Education and Skills (DfES) commissioned PricewaterhouseCoopers to undertake a Teacher Workload Study (PricewaterhouseCoopers, 2001). This concluded "In our interviews with teachers, the importance of [guaranteed timetabled] non-contact time (GTNCT) was clear: most teachers in primary schools resented having none".

To establish the extent of ICT co-ordinators' duties in respect of technical support, an open ended question was asked. Actual responses are shown in Appendix D.3 with the assigned coding as described in the following table:

No	if no technical support was expected
Yes	if they were responsible for sorting out problems before contacting the support provider
Basic/limited	for those that could set up a new system, install software and deal with simple problems
INSET	if they were expected to run training courses for the staff.

Table 5:16 Coding of Teachers Responses to ICT Duties Question

As can be seen from the figure below, nine ICT co-ordinators said 'no' their duties did not include technical support, thirteen said 'yes' it did and twelve could provide 'basic/limited' support. Two schools used the co-ordinator to run training days and one school failed to answer.

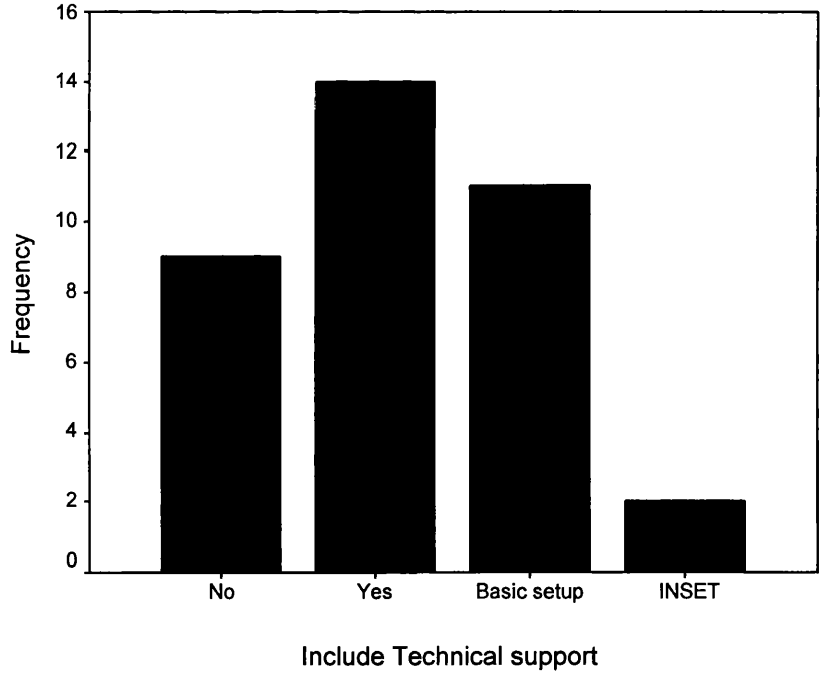

Table 5:17 Technical support included in job

The answers from the questionnaire indicate some confusion as to the role of the ICT co-ordinator. Sample answers regarding their perceived role include:

"Not supposed to be technicians"
"Software and Hardware problems if possible"
"Limited by experience and knowledge"
"Day to day problems and support"
"All problems except hardware faults"
"Allowed an hour and a half per week for duties"
"If able to fix problem"
"Subject to personal knowledge"
"Basic setup of computers and installing software"
"After school or lunchtime INSET"

This demonstrates that as well as confusion about the extent of the role there is little or no time to perform the duties and the chances of solving a problem depend on the personal knowledge of the co-ordinator.

Ofsted (2002) states that "The co-ordination of ICT demands a considerable range of expertise, requiring good ICT understanding and knowledge, technical skills and the ability to provide professional support. Too many demands are placed on some ICT co-ordinators, most of whom have a full teaching commitment and few opportunities for monitoring the subject adequately across the school. In recognition of the demands of the role, larger primary, middle and secondary schools increasingly have more than one member of staff involved in the co-ordination of ICT." This research shows that one member of staff is solely responsible for the role, sometimes performing tasks outside of the school day or in his or her own time.

5.4.2 Use of AOT to help with ICT.

To establish whether teachers had extra help in school with ICT related matters a question was asked about the use of AOTs specifically for ICT. Answers were coded as Yes, No, Considering and Not specifically.

ANSWER	TOTAL
No	18
Yes	16
Considering	1
Not specifically	1
No answer	1

Table 5:18 Use of Adults Other than teachers for ICT Support

Of the 18 schools that said 'no' to using AOTs for ICT help, one is considering employing one of their LSAs specifically as an ICT supporter and another uses AOTs for other duties in the school.

The 16 schools that answered 'yes' to using AOTs utilise the following people:

ANSWER	TOTAL
Learning Support Assistant	8
Class Assistant	1
Teaching Assistant	1
Parent	1
LSA and NNEB	2
LSA and parent	1
LSA, CA and parent	1
SEN aid	1

Table 5:19 Use of AOTs used for ICT support

This illustrates that just under half the primary schools, classroom assistants are highly utilised but, despite this, they were excluded from the NOF training programme. This means that the people with the time to help have received little or no relevant training in the use of ICT. These are potential candidates for improving the technical support capabilities of primary schools.

Although all schools are covered by a technical support contract, the questionnaire tried to ascertain that if they had no support contract, who does provide the support? Surprisingly nine schools gave the following answers:

ANSWER	TOTAL
N/A	18
Baglan	4
Parent	3
Another School	1
County technician	1
No answer	10

Table 5:20 Alternative sources of support

These answers do not indicate the awareness of a suitable alternative external supporter that could compete with the current LEA provision. Evidence here would suggest the original assumption is correct and that deficiencies of alternative technical support providers do exist in the area concerned.

5.4.3 Contingency Plans for Out of Use Equipment

Lengthy resolution times for solving problems require schools to develop strategies to cope with the temporary loss of equipment. When asked about possible contingency plans for out of use computer equipment, answers were coded in the following table:

ANSWER	TOTAL
No	17
Spare printers	2
Share printers	2
Spare resources	6
Share resources	3
Spare computers	2
Share computers	2
No answer	3

Table 5:21 Contingency Plans and Backup equipment

Just under half of the schools have no contingency plan which could be detrimental to their teaching plans. Teachers cannot confidently plan to use computers during lesson time if there is no backup for faulty equipment.

5.4.4 Funding

The following tables show the sources of funding used by the schools to buy equipment.

SOURCE	TOTAL
School budget	34
School/PTA fundraising	27
Government fund	19
Other Sources of Funding:	15
LEA	9

Table 5:22 Sources of Funding

OTHER SOURCES OF FUNDING COMPRISE:	TOTAL
GEST	4
Tesco	2
Donations	2
Local industry	2
Voucher Scheme	1
Gifts & prizes	1
Ford Trust Grant	1
Selar fund	1
NDC & local council	1

Table 5:23 Other Sources of Funding

Extra funding is available to schools from the National Opportunities Fund (NOF) and the Grant for Educational Support and Training (GEST). The table below illustrates that of the 37 schools in the survey only three did not answer which indicates a good awareness of the monies available for ICT training and hardware.

SOURCE	TOTAL
NOF and GEST	24
GEST	5
None	2
No answer	1
NOF	1
NOF, GEST and Government	1
NOF, GEST and NGfL	1
NOF, GEST and TILT	1
NOF, GEST, After School Club, Nursery Fund	1

Table 5:24 Sources of Government funding

Other aspects of technical support, for example, maintenance and repair, do not seem as well funded. Becta/DfES (2002) stated that technical support was not included as an element of the NGfL funding; rather, LEAs were expected to provide it from their existing resources. However, in the years before the implementation of the NGfL Programme, funding to LEAs for central services had been considerably reduced and, as a result, it was difficult to provide adequate technical support, even before the huge increase in ICT equipment levels in schools greatly exacerbated the need. This is supported by the National Foundation for Educational Research (NFER) which reported that funding for increases in ICT spending came from a variety of sources. Most schools (85 per cent) used some of the school budget to fund this increase (NFER, 2001).

Section 5.2 highlights the most recent problems experienced by schools and one school gave the following three responses:

"Money – we need more of it!"
"Whether to cancel our SLA with the LEA technical support provider"
"New staff members need ICT skills, maybe have a computer at home."

This indicates that funding for technical support may be a problem for some schools in this area.

5.4.5 Alternatives

Although all schools in the survey are supported by Service Level Agreements some still responded to the question regarding options for alternative support. Not all equipment is bought through the SLA and therefore other cover is sometimes required. Schools were asked to give examples of where they might go for repairs if they had no maintenance contract. Nineteen schools answered N/A, two said the technical support provider, three said a local supplier and one would make an insurance claim. The responses here showed schools were unaware of any alternative to the support they already had. One important factor schools have to consider when looking for alternative technical support is the capability of the supplier to provide curricular support. This factor will greatly influence schools' choice. To determine if schools thought there was enough local affordable support to meet the needs of ICT in the curriculum, another open question was asked. The results are shown in the table below.

ANSWER	TOTAL
No	16
Yes	11
No direct answer	8
No answer	2

Table 5:25 Is there enough affordable support?

Sixteen schools answered 'No' but 11 answered 'yes'. Some informative comments were provided and these are listed in Section 4.6:Q4.1. Generally the responses indicated that some schools would like to see a more local LEA support provider and cited the need for a faster response to support calls. Previous comments (Section 4.5: Q3.6) show that the local LEA provides a good service when they are not busy but poor service when they are busy. However, the need for improved technical support was mentioned in terms of faster response rates and better support for the school network suite. Amongst the comments were some positive ones praising the centre for curriculum support and the range of services provided. The results were further analysed by school size to see if this factor impacted on their opinions, but the outcomes were not

significantly different from the above result with more schools answering 'no' rather than 'yes' for both groups, therefore the results have been omitted from the report.

The same data was grouped by LEA region giving the following results:

ANSWER	SWANSEA	NEATH PORT TALBOT	CARMARTHEN
No	10	3	3
Yes	6	3	2
No direct answer	3	4	1
No answer	1	1	

Table 5:26 Is there enough affordable school support by LEA region.

This indicates a larger number of schools in Swansea do not think there is enough local affordable support available to them. One of the respondents suggested they would like a technical support centre like the one in Neath Port Talbot but based in Swansea.

When asked whether they knew about other technical support services available the following results were collected.

ANSWER	TOTAL
No	20
Yes	10
No answer	7

Table 5:27 Knowledge of other support available.

The ten schools that answered 'yes' suggested local companies, private firms and national chains such as PC World. Although these other sources of support have been identified, none of them offer the total package of hardware support, software support and curricular support making them unsuitable for primary school needs.

An open ended question was asked to establish how schools thought they would like to be supported. Section 4.6:Q4.3 lists the responses given grouped by LEA. The Swansea

schools' comments imply they would like a similar service to their current service provider but situated locally and with faster response times. Some expressed the desire for a full time, flexible, shared or on-site technician for maintenance and support or maybe regular weekly visits from a technician. Financial support was also mentioned by three schools and the provision of training and advice sessions. Reviewing these comments, the specific requirements for support appear to be the provision of an efficient, convenient, inexpensive and locally based technical support centre that provides good curricular advice.

Similar comments were made by Neath Port Talbot schools with requests for faster response rates, school-based technicians or regular visits, money and training. One school asked for "an effective fully managed service". Carmarthen schools require more efficient and school based support but also added they would like courses provided on the internet/web. All three counties appear to have similar requirements for technical support comprising faster response rates to problems, a local provider, a school based or shared technician allocated to the school and good curricular advice. These are the factors, as outlined in the literature review, that make a good technical support provider.

The final question on the questionnaire asked schools to outline their plans for ICT for the following year. Answers have been summarised in Section 4.6:Q4.4 and cover a range of topics. The majority of schools are planning to purchase equipment, three are replacing older computers with more modern ones and eight schools are planning to develop network suites. Completing the NOF training was mentioned by eleven schools with another five wishing to develop their use of the internet and seven schools aiming to create a school website. These comments show a wide variety of plans, many of which involve increasing the infrastructure in the schools and completing the teacher training. Both elements are fundamental to the success of the government's target to get all schools computerised and utilising ICT in the curriculum in order to improve standards in teaching and learning. A critical factor in the success of these plans is the availability of good technical support. The following chapter documents six case studies carried out one year later, which further investigate the current situation with technical support.

Chapter 6

CASE STUDIES

This chapter examines, in further detail, the six schools who agreed in the questionnaire to participate in the follow up case studies. The intention was to investigate their technical support provision one year later and to reassess the situation. Questions and full transcripts of the interviews can be found in Appendix C.

6.1 School Descriptions

School A:

This is a small suburban primary school with 131 children of which 12% are entitled to free school meals and 16% are identified as having special needs (SEN). There are 7 full time teachers and the head was newly appointed in September 2000. The ICT co-ordinator left the school recently so the head assumed this role. Being confident in IT means the Technical Support Centre technicians are prepared to troubleshoot problems on the phone so most can be solved without a callout.

School B:

School B is a medium sized suburban primary school with 248 children. The deputy head was also the ICT co-ordinator and has now been promoted to head whilst retaining this additional responsibility. Although very confident in IT there is a new deputy head starting next term who will adopt the ICT co-ordinator role.

School C:

This is a small suburban primary school of 120 children with 15% SEN and 15% entitled to free school meals. There are only four teaching staff in the school and each has two or three co-ordinator roles to perform. The current ICT co-ordinator is a new member of staff with a keen interest in IT who accepted the role when it was offered. The school belongs to the Gower Consortium of school ICT co-ordinators who share experiences and support. The ICT co-ordinator has computing experience and can deal with most problems.

School D:

School D is a large suburban primary school with 370 pupils of which 16% receive free school meals. The ICT co-ordinator is a long term member of staff but is on a year's secondment as an NOF facilitator. The job is being performed temporarily by a member of staff in the nursery department who is competent in IT and has support available.

School E:

This is a small city centre primary school with 191 pupils of which 25% are SEN and 20% receive free school meals. The ICT co-ordinator volunteered for the role when no-one else would consider it. Although reasonably confident with the older computers an update of skills would be helpful. The head is very confident with IT and can solve a lot of problems without asking for help.

School F:

School F is a large city centre primary school with 340 pupils. The deputy head is also the ICT co-ordinator but is on long term sick. The role has temporarily been allocated to a nursery teacher interested in IT who volunteered to take over the role until a replacement is found. Although lacking in confidence there is an ITEC student on a Skills Building Course at the school who is very competent and handles a lot of the support calls.

6.2 Analysis of the Case Studies

The following table summarises information from the questionnaires for the case study schools and adds relevant details gathered from the interviews a year later. This table will be referred to where relevant in the section.

School	A	B	C	D	E	F
LEA	Neath	Neath	Swansea	Swansea	Swansea	Swansea
Size	131	248	120	370	191	340
Computers:						
Old	4	-	7	10	16	12
New	13	-	5	25	19	14
Total	17	-	12	35	35	26
Additional	7	21	2	10	17	18
New total	21	21	14	45	38	32
Networked	Yes	No	No	No	Yes	Yes
Phase out old?	Keep 1	Keep all	Keep all	Keep all	Keep 2	Phase out
Ratio:						
Original	7.71	-	10.00	10.57	5.46	13.08
Year later	6.24	11.8	8.6	8.22	5.03	10.63
Internet?	Yes	Yes	Yes	Yes	Soon	Yes
Peripherals	Printer Camera Scanner	Printer Camera Scanner	Printer Camera Scanner	Printer Camera Scanner	Printer	Printer

Table 6:1 Summarised Case Studies

It is worth reiterating here that the Technical Support Centre, providing the schools' technical support Service Level Agreements, manages the two counties of Swansea and Neath Port Talbot. This has caused some concern over possible bias towards schools based within the home county of the centre, as disclosed by one school during the case study. Additional information, obtained from a meeting with the Head of ICT Technical Support at the Technical Support Centre (in May 2000), revealed that a proposal to increase the cost of the service in order to finance improvements, had been agreed in practice by Neath Port Talbot council but not by Swansea. All schools in the case studies, one year on from the questionnaire, still have a SLA with the LEA Technical

Support Centre and the following section describes the current situation in terms of infrastructure, support and funding.

6.2.1 Infrastructure

Evidence from the case studies presented in Table 6:1 shows an increased number of computers in each school with half of them (schools A, E and F) installing network suites and the other half, schools (B, C and D), have no available space to accommodate a network. School A boasts a ratio of 1:4.5 computers to children which compares favourably to the national average of 1:10 (as quoted by the interviewee). The actual figures provided range from between 1:6.24 and 1:10.5. A computer ratio of at least 1:11 was required to be able to apply for NGfL funding in 2002 (Becta/DfES, 2002).

Table 6:1 illustrates that old equipment is still widely used throughout all the schools. The Acorn computers are recommended by the Technical Support Centre for monitor and control systems and only School F intends phasing them out totally as "it is hard to buy software for these old floppy disk machines". School E is continuing to keep two of their computers in daily use whilst storing away the remaining 14. The other schools indicate the cost of replacing software as being one of the main reasons for continuing to use the older equipment. These older machines will still be used for control and monitor software by schools B, C and D with school D specifically mentioning Welsh software. However, School B voiced their concern over what will happen if they break down as they cannot easily be replaced. The associated costs attached to the older equipment are an ongoing concern for many primary schools as referred to by the Liberal Democrats (2001).

> "Where equipment is not repaired, 10 per cent said the reason was lack of funding, 15 per cent said there was no staff member available to fix the problem, 34 per cent said the equipment was too old to make the repair worth the time and money"

Another consideration for upgrading old equipment is that newly trained teachers may not have had the relevant experience of these systems especially if the ITT college has state of the art equipment. Learning to use powerful, modern equipment during teacher training can be a disadvantage when faced with old, but nevertheless, functional computers. Alternative sources for purchasing equipment are restricted by cost and support cover. Answers in the questionnaire show school E does not buy equipment from the LEA but from a local supplier. The case studies illustrate that all schools buy their equipment from the Technical Support Centre as the prices are very competitive. They are regularly sent information sheets from the support centre advertising the latest deals, although choice is restricted to two manufacturers, Mertec and Toshiba. If consulted prior to buying alternative new equipment, the support centre will usually agree to provide cover. This factor is important for schemes, like the Tesco Computers for Schools vouchers, to be beneficial to schools. School A was the only school not to mention that equipment is bought from the ICT support Centre specifically because it is covered by a support contract, although it did say it was "too lazy to look elsewhere" for competitively priced computer equipment.

Software choice is also seriously restricted by cost, as site licenses are very expensive. Schools A, B and E have the confidence to buy alternative software as they can support it themselves and School D specifically mentions the lack of Welsh software.

At the time of the questionnaire only school E was still waiting to be connected to the internet and, having been one of the last to get connected, it benefited from having the latest release of the server. Schools' impressions of internet access, one year on, are fairly mixed, with two schools commenting:

> "Very few problems and every class has internet access" (School E)
> "Computer suite is all linked, so are the junior classrooms" (School F)

In contrast, School B said "it [the internet] can be very slow", but they are having broadband installed soon, and School C has had constant problems with their connection preventing them from using it during class. For schools to incorporate ICT and the NGfL in their teaching, they must have reliable and efficient access to the internet. This can be

resolved by installing broadband, which, although expensive, runs faster and is more reliable than dial-up or ISDN internet connections. However, the geography of Wales does not lend itself to broadband in some rural areas, so alternative technology has to be sought. Installing broadband will also have an impact on the expertise required of the ICT co-ordinator in terms of technical support if the school is to make a success of the technology. Ultimately, teachers need to have confidence in their internet connection when planning to use it during lessons and this is not the case for three of the case study schools, one of which (School C) has had a discouraging introduction to the 'use', or 'lack of use' of the internet. From the literature, problems with the internet are also reported in the annual survey trends by the NFER (2001) where only 30% of schools say their internet connection is of high enough quality to be used during lessons and 56% answering that 'sometimes' it is. This is not a satisfactory situation for schools that are being pushed to incorporate the NGfL into the curriculum.

6.2.2 Problems

The range and types of problems encountered at the time of the questionnaire consisted of faulty printers, internet problems and freezing/crashing machines, the latter being reported by four of the case study schools with two of the incidents specifically on the older machines . However, the introduction of network suites and servers has brought with it a new range of problems. Four of the schools mention network or server problems as well as the expected printer and internet problems. Problems with a digital camera were also mentioned by two schools in the case studies, which they had not experienced at the time of the questionnaire. Only one school from the questionnaire survey included a digital camera problem out of a possible 111 entries that could have been made from the entire survey (37 schools times 3 problems each). Considering 27 schools own a digital camera, this implies the equipment was either very robust or that little use was being made of it. 'Other' problems fall into the category of maintenance, for example, a sticky keyboard, floppy disk stuck in drive, broken mouse, a pulled out CD drawer and a faulty monitor. These sorts of problems can usually only be resolved by a qualified technician, which in this case is the LEA technical support centre.

Internet and network server problems can be handled in one of two ways, internally, by asking the ICT co-ordinator to look at it, and externally, by phoning the technical support provider in the hope they will talk the caller through finding a solution. This is where the skill and experience of the ICT co-ordinator makes a difference to the resolution time of a problem. A knowledgeable co-ordinator will not be afraid to have a go at fixing a problem which reduces the chances of a call-out. On the other hand, an inexperienced ICT co-ordinator may not have the skills to attempt any kind of problem solving and will need a good, reliable source of support. Internet access times can be a problem, but the response rate is only impeded by the routing of all access through a filtering system in place at the support centre, for the protection of the children whilst using the internet.

6.2.3 External Technical Support

All schools remain with the same LEA technical support provider, paying for a standard contract that offers engineer callout, sending equipment back for repair, telephone support and curricular support. Overall impressions are that response times for problems seem quicker, especially those involving a network server, and the Support Centre appears more organised. There are however some concerns:

> "technicians refuse to look at other problems if they haven't been logged" (Schools B and D)
>
> "technicians are still prompt at responding but they are slow to complete" (School C)
>
> "ordering equipment takes a very long time" (School D)

It appears the set up at the support centre has become more complex, with technicians in different departments for software and hardware related problems. A great deal of pressure is now placed on the person reporting the fault to correctly diagnose its cause. The engineers will not look at a problem if it has not been logged for that call out.

School B appreciates "a tighter controlled system gives better service in the long run" and School E would be willing to "pay more, within reason, to improve the service".

School D also has concerns over a possible bias towards one county over the other:

"There appears bias toward the schools in that county for example some of them are already aware of follow up sessions to the NOF training, whereas this county's schools have not yet been informed."

The school also commented that at a head teachers' meeting the previous year, plans were discussed to "set up a local county equivalent to the shared ICT Support Provider based in the next county" but it was agreed to leave things as they are for the foreseeable future.

6.2.4 Internal Support

All schools now seem willing to do some problem solving themselves. Where the head or deputy head are also the ICT co-ordinator more time is available to them to look into problems and monitor their progress (Schools A and B). Lack of time allowance for the schools with full-time teaching ICT co-ordinators hinders the same diligence. Problem solving is undertaken during break times or after school as there is usually no staff cover. One school has developed a system to facilitate this by asking staff to list problems that need sorting. Another school mentors an IT Squad of year 5 and year 6 children to solve routine tasks and common problems. Only one school (F) has a temporarily elected ICT co-ordinator who was persuaded to take the role due to the circumstances. Fortunately they have good support from an NVQ student on a work placement who is always available to sort out problems. Generally schools only pass problems to the technical support provider as a last resort but procedures for tracking reported faults have also improved, mostly by logging the call reference allocated to them and recording the details to monitor the progress.

Since the questionnaire, more schools are aware of the software support content included in their technical support contract and those buying alternative software packages, off

the shelf, make good use of the available telephone helpline numbers. Schools that are more confident with ICT are generally more able to sort out most of their own software problems and not have to rely on external support.

The subject of training was not covered in the questionnaire however, the situation in the case study schools gave the following picture. All schools use the Technical Support Centre for training days although School A commented on the simplicity of the course and the lack of technical content. Likewise Schools B and E were disappointed finding it more like an assessment of what they knew rather than teaching them anything new. Conversely School D was enthusiastic about the training sessions received. Training sessions can be conducted either in-house or at the school. The system for inviting a trainer to the school involves using an allowance. This is insufficient for the number of staff involved and the amount to learn. Alternatively teachers can visit the Support Centre but the drawback here is expense of cover if it isn't an INSET day for the school. Schools A, B, E and F also organise their own internal training sessions with school C inviting in guest speakers for their consortium.

6.2.5 Funding

Information from the questionnaires shows that all schools use their budget to buy equipment, but School C also uses (unspecified) money from the LEA. Schools D and E have indicated they use government funding with School D specifying NGfL as the source. Neither school D nor E use fundraising to purchase equipment, whereas the remaining four schools do. The government funds available to schools, namely GEST for buying equipment, and NOF to pay for teacher training are mentioned by all schools. Schools A, B and E mention only GEST, schools D and F mention GEST along with NOF and School C only mentions NOF. These results could indicate that the schools not mentioning NOF funding were not quite ready to start the training. In the light of the governments' targets, this is something that needs to be addressed in those schools to achieve the confidence and competence required for incorporating ICT into the curriculum.

6.2.6 Alternative Support

One year later the case study schools seem more aware of alternative sources of technical support. Examples of how schools can achieve satisfactory levels of technical support are varied.

"Aware of some alternatives but afraid to make a change" (School A)
"No - haven't looked elsewhere because of cost" (School B)
"No - knows of companies that lease equipment but they are too expensive." (School C)

Some schools have looked at the feasibility of contracts with different external providers, however, they are reluctant to change because of the provision of curriculum support currently offered by their LEA support centre. This is an important consideration for a primary school's support contract as it is a specialised subject requiring technical and educational knowledge. Another option talked about is the sharing of a technician with a secondary school in the area. Most secondary schools have their own technical support team and technician time is 'sold' to local primary schools. This arrangement can limit the service to both schools although primary schools are unlikely to need a technician on-site all day every day. Suggestions about investing in the set-up of a new LEA support provider gives another possible option, especially for the county that is currently sharing a resource, although the cost involved is prohibitive. School D would like to have a technician allocated to the school but realise it would be too expensive. Leasing has been considered by School C which would like to keep all software up-to-date as part of their technical support agreement. Lastly, a consortium of schools could be created to employ a joint technician to be based at one of the schools. School A calculates that if each school were to pool the cost of their SLA cover there would be sufficient money to employ a technician. The logistics of timetabling schools' requirements could then cause even more problems. In summary, there are a number of options available to primary schools for the provision of technical support but consideration must be made for the curriculum content provided.

6.3 Update January 2004

In order to address the length of time elapsed from collecting the case study information and sending it to print, a follow up conversation with a case study headteacher provided anecdotal evidence that the situation in respect of LEA technical support in this area has not changed. The school continues to pay into the LEA SLA even though their budget for this expenditure is not governed by a particular option. The head is free to buy whatever technical support provision they wish, but this is where the main problem lies. As a non-technical person, the head relies on the technical expertise that exists within the LEA support centre. Furthermore, the head does not have the time or technical knowledge to enable them to search for a feasible alternative solution that may be available in the area. The head is aware of colleagues in other schools who lease equipment and have private agreements for technical support. One school has bought and set up a network themselves. These schools tend to have strong technical skills internally and are therefore not dependant on a third party for support. Overall, the school is more than satisfied with the curricular support and training provided by the LEA, although there are minor complaints about the distance from the training centre to the school. From the questionnaires, the most common complaint about the technical support provider was related to response times, not so much the time taken to respond to a call, but the actual time taken to resolve a technical problem once it had been reported. This situation, it appears, is still the main cause of dissatisfaction with the local LEA support provider experienced by this headteacher. As a final point the head commented that if all schools in the area pulled out of the LEA SLA the result would be less funding for the centre and consequentially, a reduced level of support.

Chapter 7

CONCLUSION

The primary research question posed at the beginning of this study was "To what extent are deficiencies in technical support systems impeding progress in introducing ICT into primary schools, particularly in the South Wales region". In attempting to answer the question, this research has shown that the adoption of ICT into schools is being inhibited by a number of factors. The Government targets for ICT in schools and the creation of the NGfL are outlined in Chapter 1. These targets are being increased year after year, as illustrated in Chapter 2. However, whilst indications are that the broad targets are being met, this research has illustrated that without an appropriate level of technical support for all equipment, software and training, there will always be a level of dissatisfaction. Many examples of this discontent are found in Chapter 2. Evidence of the broad targets being met is highlighted in the published ratios of children to computers from the DfES (Department for Education and Skills) annual reports. These show improving ratios each year. As described in Section 5.1.3., the ratios encountered in the sample studied are in line with the national averages quoted in the DfES reports. Ofsted (2001) reported that the national ratio of children to computers is 11.8:1 and this compares well to the average of 11:1 for this study. In addition, this research shows 89% of schools were connected to the internet compared to the national U.K. average of 98%.

Analysis of the questionnaires and case studies showed that, although investment is being made in new equipment, there is still a large investment existing in older technology. Evidence from the questionnaires confirms the Liberal Democrats' (2001) research showing an increasing number of older computers which were either outdated or required upgrading before they could be used to access the internet. At the time of the

survey Windows 2000 was the latest operating system, for instance, and only appeared in two schools from those surveyed although neither were involved in the case studies. Essentially, the Government targets look achievable through the published statistics but the evidence here shows there to be a very different picture.

At the time of the case studies, the situation with infrastructure had changed slightly but not dramatically. Participating schools had all purchased new equipment but they were still reliant on the older technology because of the large amount of software installed on these systems and the lack of funding available for replacements. For several schools in the study, the cost of software licenses was prohibitive within their budget constraints. This reliance on older technology implies maintenance costs will be greater as the standard service level agreement only covers older equipment on a best endeavours basis. Spares and support skills for older equipment are more difficult to find. The trend within the technical support providers' community is to standardise on newer hardware and software configurations, known as managed services, which enables problems to be resolved more quickly since spares are readily available and software configurations are fixed and known. So far take up on these services has been slow because they are costly, as detailed in Chapter 2.

In order for schools to make full use of their ICT infrastructure, problems need to be resolved at the time of need, not hours or days later. Only under these conditions can ICT become an integral part of the curriculum. Support also needs to cover all facets of technical support to include repair, maintenance, trouble-shooting and training. Results from the questionnaire highlighted schools' concern about lengthy resolution times and problems with the physical distance from the LEA support provider. Section 5.3.3 concluded that more than half of the schools say problems take a week or longer to be resolved which is unacceptable in the Government's drive to increase the use of ICT in teaching and learning. Schools do seem to require more immediate help with technical problems and as such are evaluating how their money could be better spent to improve their cover for support. Although the schools in the study are tied into their LEA supplier, with freedom of choice and the necessary budget, they stated a preference for more localised support which could come from the LEA support provider, an onsite technician or a technician shared between sites. Within Swansea, the LEA has discussed

funding its own technical support provider. Some options being considered are to employ a technician to share between several schools on a co-operative basis or for schools to employ their own dedicated technician. This view is supported by Section 5.4.5 in which sixteen of the schools in the sample felt there was not enough affordable local support and this was also echoed in the comments made in the case studies. Several of the schools visited in the case studies had evaluated alternative means of technical support but ruled them out for financial reasons.

Evidence in the literature confirms that the ICT co-ordinator provides a crucial role in providing the primary school with technical support to enable it to utilise its own resources. Analysis of the questionnaires illustrates that the primary school ICT co-ordinators' understanding of their role was initially confused, since most thought that technical support was not part of their remit. This is not surprising considering a subject co-ordinator, by definition, "promotes and co-ordinates the development of a subject area". However, more recently, the specific definition of the ICT co-ordinator's role has been developed to include those elements of technical support and maintenance they had acquired in practice anyway (Becta, 2004). By the time the case studies were conducted, the ICT co-ordinators in the study had realised the significance of this role and were learning how to resolve common faults and problems. While large schools may have more than one person who could fulfil this role, smaller schools could struggle. One of the schools has a temporary ICT co-ordinator, a nursery teacher, who stepped into the role to cover for long term sick leave, although they have extra support from a student and a supply teacher. This is a good temporary measure but a precarious situation which illustrates there should always be at least one or more backup for technical support. Not all schools could be this fortunate. This reinforces the need to spread the expertise across members of staff as is the provision of the NOF training and the QTS award for new teachers.

The questionnaires and case studies revealed that little or no time is allocated to technical support in a large number of schools, which implies the job can only be performed at the end of a working day or when time permits. This does not do the role justice and time outside of normal teaching duties is required. Analysis of the case studies demonstrates that when the headmaster or deputy head perform the role there is

more time available within the working day to undertake and manage the required tasks. Estyn (2002) in their review of ICT in schools explain that the best situation for a school to be in is where the ICT co-ordinator has plenty of non-contact time. A number of the surveyed schools revealed that classroom assistants help with these duties but surprisingly they have been excluded from the government's training initiatives. Some schools have innovatively trained pupils to resolve common problems. Initiatives such as these should to be encouraged. The PricewaterhouseCoopers' study (2001) into teacher workloads has explicitly suggested that teachers should be allowed non-contact time as a chance to develop their professional ICT skills. The aim would be to release teachers for a pre-determined amount of time each week by utilising supply teachers. Original considerations to this effect by the PricewaterhouseCoopers' study did not specifically consider the extra pressures of the ICT co-ordinators extended work role. However, the latest WAMG (2003) report identifies the task of technical support as additional to the normal teacher's workload and recommends it be transferred to support staff. Whether all schools could afford this approach is debateable given the pressure on school budgets.

Since the start of this research the situation within primary schools has changed in terms of better infrastructure and a general appreciation by teachers of the benefits of ICT. Despite this there are indications that problems have become more complex and have to be resolved in a shorter space of time if reliance on the technology for teaching and learning is to be achieved. For example, if the lesson requires the use of a computer which is networked and the server is down, then the server needs to be fixed immediately. If internet access is slow then the problem needs to be resolved straight away. Evidence from the NGfL Pathfinders Report (DfES/NGfL, 2002) on the final rollout of the NGFL programme, points out that "pupils have difficulty accepting that computers make life easier if they break down often" and "teachers said that they were resentful of wasted learning time." In response to this sort of comment the Welsh Assembly is considering funding courses at Further Education Colleges to train school based ICT Systems Maintenance Technicians (National Assembly, 2000). They see this role as being of key importance, not only in schools, but in the National Health Service and other public bodies.

Anecdotal evidence from a recent parent's evening highlights the disparity that still exists between increasing the infrastructure and training the teachers in how to use it. During the evening one teacher was overheard enthusing over the new whiteboard in their classroom and how easy it was to prepare lessons using the technology, whilst another teacher was heard voicing their apprehension about the new technology and how they stayed away from it as they didn't have the confidence to try using it.

Schools are improving their infrastructure, newly qualified teachers are acquiring ICT skills, practicing teachers are being trained in ICT but ICT co-ordinators still have heavy demands made on their time for solving technical support problems. This deficiency must be addressed for primary schools to have the quality of support they need to successfully integrate ICT in the curriculum.

BIBLIOGRAPHY

ACCAC (1998) *Research into Whole School Approaches to Developing IT capability.*

ACITT (2001) *Digitalbrain Volume 1 Issue2.* Accessed Jan 2004.
http://acitt.digitalbrain.com/acitt/web/resources/pubs/Journal%2002/dominic.htm

ADAMS, J. (1998) *ICT in ITT - The New Standards for the Award of QTS,* Paper presented at the British Educational Research Association Annual Conference, Queen's University of Belfast, Northern Ireland, August 27th to August 30th 1998.

BECTA (2000) *Connecting Schools, Networking People.* Coventry: BECTA.

BECTA (2001) *Customer Satisfaction Survey: ICT in Schools,* accessed Jan 2004.
http://www.becta.org.uk/satisfactionsurvey/2001/customer_satisfaction_survey.pdf

BECTA (2002) *The Performance indICaTor - a Report on Schools - Satisfaction with their ICT Products and Services.*

BECTA (2003) *Information Sheet 3,* Web page accessed Jan 2004.
http://www.becta.org.uk/page_documents/research/infosht03.pdf

BECTA (2004) *ICT Advice for Teachers.* Web page accessed Jan 2004.
http://www.ictadvice.org.uk

BECTA/DfES (2001a) *NGfL Pathfinders: Preliminary Report on the roll-out of the NGfL Programme in ten Pathfinder LEAs,* A report to the DfES by Bridget Somekh, Sally Barnes, Pat Triggs, Rosamund Sutherland, Don Passey, Hilary Holt, Colin Harrison, Tony Fisher, Gordon Joyes and Rachael Scott.

BECTA/DfES (2001b) *NGfL Pathfinders: Second Report on the roll-out of the NGfL Programme in ten Pathfinder LEAs,* A report to the DfES by Bridget Somekh, Derek Woodrow, Sally Barnes, Pat Triggs, Rosamund Sutherland, Don Passey, Hilary Holt, Colin Harrison, Tony Fisher, Andy Flett and Gordon Joyes.

BECTA/DfES (2001c) *ImpaCT2: Emerging Findings from the Evaluation of the Impact of Information and Communications Technologies on Pupil Attainment.*

BECTA/DfES (2002) *NGfL Pathfinders: Final Report on the roll-out of the NGfL Programme in ten Pathfinder LEAs,* A report to the DfES by Bridget Somekh, Derek Woodrow, Sally Barnes, Pat Triggs, Rosamund Sutherland, Don Passey, Hilary Holt, Colin Harrison, Tony Fisher, Andy Flett and Gordon Joyes.

BECTA/DfES (2003) *The Performance IndICaTor: A Customer Satisfaction Survey of ICT in Schools.* Web page accessed Jan 2004.
http://www.ictadvice.org.uk/performance/documents/all_sections.pdf

BECTA/DfES (2004) *An Investigation of the Research Evidence Relating to ICT Pedagogy,* A report to the DfES by: Editors: Cox, M. and Webb, M.; Authors: Cox, M., Webb, M., Abbott, C., Blakeley, B., Beauchamp, T. and Rhodes, V.

BENNETT, R., HAMMILL, A., NAYLOR, C. and PICKFORD, T. (1997) *Working with Children in College: an evaluation of an exploratory IT module with undergraduate primary student teachers*, Journal of Information Technology for Teacher Education, Vol 6, No. 3, 1997 pp285-303.

BESA (2000) *ICT in UK state schools survey 2000.*

COX, M., PRESTON, C., and COX, K. (1999) *What Factors Support or Prevent Teachers from Using ICT in their Classroom?* Paper presented at BERA Annual Conference, University of Sussex, Brighton, Sept 2-5 1999.

DAWES, L. (1999) *First connections: teachers and the National Grid for Learning,* Computers & Education Vol 33 Issue 4, 1 December 1999, pp 235-252.

DEARING, R (1994) *The National Curriculum and its Assessment: Final Report,* London: School Curriculum and Assessment Authority.

DfEE (1995) *Superhighways for Education.* London: HMSO.

DfEE (1997a) *Preparing for the Information Age: Synoptic report of the education Departments' Superhighways Initiative.* London: DfEE.

DfEE (1997b) *Connecting the learning society: National Grid for Learning. The government's consultation paper.* London: DfEE.

DfEE (1998a) *Open for Learning, Open for Business. The Government's National Grid for Learning Challenge.* London: DfEE.

DfEE (1998b) *Initial teacher training and the use of information and communication technology in subject teaching* (Annex B of DfEE Circular 4/98). London: DfEE.

DfEE (2000) *Statistics of Education: Survey of Information and Communications Technology in Schools, England: 2000.* London: HMSO

DfES (2001) *Statistics of Education: Survey of Information and Communications Technology in Schools 2001.*

DfES (2002) *Statistics of Education: Survey of Information and Communications Technology in Schools 2002.*

DfES (2003) *Statistics of Education: Survey of Information and Communications Technology in Schools 2003.*

ESTYN (2001) *Information and Communications Technology in Initial Teacher Training Courses: Secondary Phase.*

ESTYN (2002) *A Review of Information and Communications Technology Provisions in Schools and its Impact on Raising Standards.*

GALANOULI, D. and McNAIR, V. (2001), *Students' perceptions of ICT-related support in teaching placements.* Journal of Computer Assisted Learning, 17 (4), pp396-408.

HARRIES, N. (2000) *Technology on the brink,* TES Articles, 07/07/2000.

JAPONITE (2001) *A Report on the Employment of I.T. Technicians in Schools.* Joint Advisory Panel on Information Technology in Education.

KENNEWELL, S. (1999) *Information and Communications Technology in Subject Teaching: Can Teacher Education Succeed as Tailor to the Emperor?* The Welsh Journal of Education Vol. 8 No. 2, pp35-47.

KNIGHT, R. (2002) *Time Out,* TES Reports, 14th June 2002.

LEASK, M. and MEADOWS, J. Eds. (2000) *Teaching and Learning with ICT in the Primary School.* London: Routledge.

LEASK, M and PACHLER, N., Eds. (1999). *Learning to Teach Using ICT in the Secondary School,* Routledge.

LEASK, M and WILLIAMS, L. (1999) *Whole-school Approaches: Integrating ICT across the Curriculum:* Chapter 12 in LEASK, M and PACHLER, N. Eds. (1999) *Learning to Teach Using ICT in the Secondary School,* Routledge, p194.

LIBERAL DEMOCRATS (2001) *Summary of Liberal Democrat Survey on: Information Communications Technology In Schools.*

LOVELESS, A. (1995) *IT's Just Another Plate to Spin: primary school mentors' perceptions of supporting student experience of information technology in the classroom*, JITTE Vol. 4, No.1, pp 39-50.

LYNCH, W., Hobbs, B., and Hollanders, H. (1999) *Dancing on Quicksand, The role of the ICT co-ordinator in the primary school*, Research in Education No. 62 pp32-40.

MCKINSEY & COMPANY (1997) *The Future of Information Technology in UK Schools,* London, McKinsey & Company.

MOSELEY, D., HIGGINS, S., BRAMALD, R., HARDMAN, F., MILLER, J., MROZ, M., TSE, H., NEWTON, D., THOMPSON, I., WILLIAMSON, J., HALLIGAN, J., BRAMALD, S., NEWTON, L., TYMMS, P., HENDERSON, B. and STOUT, J. (1999) *Ways forward with ICT: Effective Pedagogy using Information and Communications Technology for Literacy and Numeracy in Primary Schools.* Newcastle: University of Newcastle.

MUMTAZ, S. (2000a) *Using ICT in Schools: a review of the literature on learning, teaching and software evaluation.* June 2000. A publication from: The Centre for New Technologies Research in Education, Institute of Education, University of Warwick, Coventry.

MUMTAZ, S. (2000b) *Factors Affecting Teachers' Use of Information and Communications Technology: a review of the literature,* Journal of Information Technology for Teacher Education, Vol. 9, No. 3, pp319-341.

MURPHY, C. and GREENWOOD, L. (1998) *Effective Integration of Information and Communications Technology in Teacher Education,* Journal of Information Technology for Teacher Education, Vol. 7, No. 3, pp413-429.

NATIONAL ASSEMBLY FOR WALES (2000) *Education and Lifelong Learning Committee: Information and Communication Technology in Education, Expert Advisor Report.*

NFER (2001) *Annual Survey of Trends in Education, Digest No. 11: Information and Communications Technology (ICT) in the Primary School*, NFER.

NG, S (2002) *The use of information & communications technology (ICT) in teaching & learning English in primary schools in Wales & Singapore.* MA(Ed) Thesis, University of Wales, Swansea.

NPADC (National Policy Advisor and Development Committee) (2001), *The Impact of Schools IT2000*, Sept 2001.

OFSTED (2001) *ICT in Schools: The impact of government initiatives - An interim report.* London: Office for Standards in Education.

OFSTED (2002) *ICT in Schools, Effect of government initiatives, Progress report.* London: Office for Standards in Education.

PELGRUM, W. J. (2001) *Obstacles to the integration of ICT in education: results from a worldwide education assessment.* Computers & Education 37, pp163-178.

PRESTON, C.; COX, M.; COX, K. (2000) Teachers as innovators: an evaluation of the *motivation of teachers to use information and communications technologies,* MirandaNet.

PRICEWATERHOUSECOOPERS (2001) *Teacher Workload Study: Final Report.* London: DfES.

PRITCHARD, A. (2001) Meeting the Requirements of the Initial Teacher Training *National Curriculum for the Use of Information and Communications Technology in Subject Teaching, with One Year's Cohort of Postgraduate Primary Trainees*, University of Warwick, Coventry, United Kingdom, Journal of Information Technology for Teacher Education, Vol. 10, No. 3, pp293-309.

RONNKVIST, A., DEXTER, S. L., ANDERSON, R. E. (2000) *Technology Support: Its Depth, Breadth and Impact in America's Schools,* Teaching, Learning, and Computing: 1998 National Survey, Report #5, Center for Research on Information Technology and Organizations, University of California, Irvine And University of Minnesota.

SAUNDERS, M., LEWIS, P., THORNHILL, A. (1997) *Research Methods for Business Students*, London: Pitman Publishing.

SELINGER, M. and YAPP, C. (2001) *Can ICT improve the recruitment, retention and morale of teachers?* in ICTeachers by Michelle Selinger, London: IPPR.

SIMPSON, M., PAYNE, F., MUNRO, R. & HUGHES, S. (1999) *Using Information and Communications Technology as a Pedagogical Tool - Who Educates the Educators?* Paper presented at the European Conference on Educational Research, Lahti, Finland 22-25 September 1999.

SOAMES, S. (2000) *BBC News Online Forum, Technology in schools: Ask Michael Wills,* Accessed Jan 2004. http://news.bbc.co.uk/1/hi/talking_point/forum/737533.stm

STEVENSON, D., ANDERSON, I., BERWIN, N., HEPPELL, S., SUMMERS, N., WHATFORD, C. and WINKLEY, D. (1997) *Information and Communications Technology in UK Schools, An independent enquiry*, London: The Independent ICT in Schools Commission.

WAMG (2003) *Raising Standards and Tackling Workload: a National Agreement.*

WELSH ASSEMBLY (1999) *Pre 16 Education, Schools and Early Learning Committee: Policy Development - LEA Procurement of ICT, Collated Responses.*

WELSH ASSEMBLY (2000) *Pre 16 Education, Schools and Early Learning Committee, Agenda Item 4: Policy Review - Information and Communications Technology (ICT) in Education.*

WILLIAMS, D., WILSON, K., RICHARDSON, A., TUSON, J., and COLES, L. (1998) *Teachers' ICT Skills and Knowledge Needs: report on a study conducted for Scottish Office Education and Industry Department.* Aberdeen: The Robert Gordon University.

WILLIAMS, D., COLES, L., WILSON, K., RICHARDSON, A. and TUSON, J. (2000a) *Teachers and ICT: current use and future needs*, British Journal of Educational Technology, Vol. 31, no. 4: pp307-320.

WILLIAMS, D., COLES, L., RICHARDSON, A., WILSON, K. and TUSON, J. (2000b) *Integrating Information and Communications Technology in Professional Practice: an analysis of teachers' needs based on a survey of primary and secondary teachers in Scottish schools*, Journal of Information Technology for Teacher Educational, Vol. 9, No. 2: pp167-182.

WIS (WALES INFORMATION SOCIETY) (1997) *Education and Training Work Group: Notes of Meetings during 1997.*

APPENDIX A:

HISTORY OF ICT IN EDUCATION

1988: National Curriculum implemented with 3 core subjects – English, Maths and Science and 7 foundation subjects: History, Geography, Technology, a Foreign Language, Art, Music and Physical Education.

1994: The Dearing Report on the Curriculum revised its structure and separated IT from DT.

Jan 1995: The Education Departments' Superhighways Initiative (EDSI). The Secretary of State for Education's challenge to British education to exploit the potential of a UK education superhighway.

April 1995: Superhighways For Education, Consultation Paper on Broadband Communications from the Department for Education, The Scottish Office, Department of Education Northern Ireland and the Welsh Office (raising the whole debate about the potential of new broadband networks for education and training and inviting responses and pilot project submissions from industry and education.)

Nov 1995: Superhighways For Education - The Way Forward. Summarised responses to the consultation and naming of the pilot projects.

March 1997: Information and Communications Technology in UK Schools – An Independent Inquiry (The Stevenson Report). Led to the setting up of the NGfL. Used input from the McKinsey report.

March 1997: The Future of Information Technology in UK Schools (The McKinsey Report). This report was developed by McKinsey & Company, with the aim of producing a completely independent analysis of the issues, challenges, and opportunities surrounding the use of information technology in schools.

July 1997: White Paper – Excellence in Schools. (Secretary of State David Blunkett).
This White Paper sets out our vision for education in schools in England; a second White Paper later this year will do the same for lifelong learning.

July 1997: White Paper – Building Excellent Schools Together. (Secretary of State for Wales). Policy framework for education for the following five years representing the distinctive nature of the education system in Wales. A clear, coherent strategy will be put in place for ICT.

Oct 1997: Consultation Paper – Connecting the Learning Society. The National Grid for Learning Consultation. (Result of the Stevenson report).

May 1998: Our Information Age. The Government's vision of the opportunities for Britain presented by new technologies.

June 1998: Connecting Schools, Networking People. Becta document. ICT Planning, Purchasing and Good Practice Guidance for the NGfL.

Sept 1998: Green Paper – The BEST for Teaching and Learning in Wales. (Education minister for Wales). Deals in greater depth with principles set out in BEST. Separate Green paper for proposals especially adapted to the needs and circumstances of Wales.

Sept 1998: Information Technology became a core subject.
All trainee teachers required to achieve set standards in ICT to be awarded QTS.

Nov 1998: Paper – Open for Learning, Open for Business. The Government's National Grid for Learning Challenge. Follow up to Connecting the Learning Society, which was the consultation paper on the NGfL.

Dec 1998: Green paper – Teachers Meeting the Challenge of Change.
Sets out Government's proposals to improve the teaching profession. Plans announced for new national tests for all trainee teachers in numeracy, literacy and ICT.

Autumn 1999: New Opportunities Fund (NOF).
Money allocated to train practicing teachers in how to integrate ICT into subject teaching.

APPENDIX B:

QUESTIONNAIRE

ICT QUESTIONNAIRE FOR PRIMARY SCHOOLS

All details provided for this survey will be treated with the strictest confidentiality.
Information in Section 1 to be used for contact purposes only.

SECTION 1: School Details *to be completed by the head teacher / secretary*

Please amend any details that are incorrect:

School Name : «School_name»
School Address : «Road»
«Area»
«Town»
Post Code : «Post_Code»

Telephone : «Tel»

FAX : «Fax»

e-mail : _____

Name of Head : «Title» «Initials» «Surname»

IT Co-ordinator : _____

School Size : Number of children _____
% of SENs _____
% of free school meals _____

Type of school : _____
(e.g. LEA, voluntary aided).

LEA name : _____

I will be following up this survey with a select number of case studies. If you would be prepared to spare half an hour to take part in the interviews please tick the box below.

☐ I am interested in taking part in the interviews.
☐ I am willing to be interviewed over the phone.

Please return to Angela Davies, EBMS, University of Wales Swansea, Swansea SA2 8PP.

SECTION 2:Equipment and Usage *to be answered by ICT Co-ordinator*

2.1 What computer equipment does the school have – please add others to the list :
(do not include machines used solely for administration purposes)

COMPUTER TYPE	OPERATING SYSTEM	QUANTITY
Windows PC	3.1	
Windows PC	95/98	
Windows PC	NT	
Acorn	RISCOS	
Acorn	RISCPC	
BBC		

2.2 What are your 3 most commonly used peripherals :
(e.g. printer, scanner, digital camera)

1. _____
2. _____
3. _____

2.3 Does the school have SEN computer equipment? Yes..☐ No..☐
(If Yes please give examples below):

_____
_____

2.4 What 5 software packages do your teachers use most?
(e.g. word processor, spreadsheet, drawing) :

1. _____
2. _____
3. _____
4. _____
5. _____

2.5 Is your choice of software limited by any of the following constraints :
(please tick all that apply) :

Software not supported by the LEA.... ☐
Lack of training available..... ☐
Cost of software too high.....☐
No budget available.....☐
Suitable software is unavailable.....☐
Other *(please specify)*.....☐

_____

2.6 Does the school have an Internet link? Yes...☐ No....☐

2.7 Which Internet Service Provider do you use? _____

2.8 Do you visit any Internet sites for help with software or hardware problems? Please specify : _____

_____

2.9 Where have you purchased your computer equipment from :
(Please tick all that apply and state name(s) alongside):

Through LEA.....☐ _____
Local supplier.....☐ _____
National supplier.....☐ _____
Second hand.....☐ _____
Voucher Schemes...☐ _____
Competitions.....☐ _____
Other.....☐ _____

2.10 Were any special deals included with equipment purchase e.g. on-site maintenance beyond warranty period, training days, telephone support?

_____

_____

_____

2.11 What source of funding do you use for purchasing computer equipment?
(please tick all that apply)

School budget.....☐
LEA.....☐
Government fund eg NGfL..☐
School/PTA fundraising.....☐
Other (please specify).....☐ _____

2.12 Does the school receive funding particularly for ICT e.g. NOF, GEST?
(please specify source of fund and tick the relevant column for use of money):

Source of Fund	Hardware	Software	Training

SECTION 3: Computer Support Provision *to be answered by ICT Co-ordinator*

3.1 Is there a set procedure that teachers follow when there is a problem with computer hardware or software? Yes...☐ No...☐

3.2 Please outline the initial steps a teacher would take to solve the problem :

_____

_____

_____

3.3 Does the school have support/maintenance contracts for its computer equipment with any of the following? *(please tick all that apply):*

LEA (Service Level Agreement)..... ☐
The hardware supplier..... ☐
A local computer company..... ☐
Another educational establishment..... ☐
Other (please specify below)..... ☐

_____

3.4 What does the contract include? *(please tick all that apply):*

Extended warranty..... ☐
School site visits..... ☐
Removal of equipment for repair..... ☐
Telephone support / helpline / e-mail..... ☐
Other (please specify below)..... ☐

_____

_____

3.5 How far away is the support provider and is this a problem? *(Examples please):*

_____

_____

3.6 With a maintenance call-out what is the usual response time for resolving a problem? *(please give some examples below):*

_____

_____

3.7 If the school has no maintenance contract for a piece of computer equipment what options are there for having it repaired/replaced? *(please give examples below):*

_____

_____

_____

_____

3.8 Does your school have support for any of its software packages?

Telephone support for questions about how to use software.....☐
Telephone support that offers a school visit for difficult problems..☐
Support that offers e-mail correspondence.....☐
None.....☐
Other (please specify below).....☐

_____

3.9 With the software support contract what is the usual response rate for a call with a problem? *(please give some examples):*

_____

_____

3.10

About the ICT Co-ordinator	Yes	No
Is the ICT Co-ordinator's job a full-time post?	☐	☐
Is it an extra responsibility for a teacher?	☐	☐
Can they easily be released from class to solve problems?	☐	☐
Do they have a time allowance to carry out responsibilities?	☐	☐

3.11 Do the ICT co-ordinator's duties include technical support and to what extent?

_____

_____

_____

3.12 Does the school use AOTs (adults other than teachers) specifically for ICT help? Please specify *(e.g. learning support assistants, teacher's aids, parents) :*

_____

_____

3.13 If the school has no support contracts and the ICT co-ordinator cannot solve the problem, where do you go for help? *(e.g. parent governor, expert pupil, another school's technician) :*

_____

_____

3.14 What are the 3 most recent computer related problems from the last 3 months?

1. _____
2. _____
3. _____

3.15 If a computer or printer is out of use does the school have a contingency plan? *(e.g. spare resources, replacement agreement with supplier etc.)*

_____

_____

_____

SECTION 4: *Open format questions - feedback from this section is vital to project*

4.1 Do you think there is enough local affordable computer support to meet the needs for curriculum requirement?

4.2 Do you know of any other support services available in the area?

4.3 Ideally how would your school like to be supported?

4.4 What are your plans for ICT development for the coming year?

APPENDIX C

CASE STUDY QUESTIONS AND ANSWERS

1. **Who provides your technical support and have they changed since the questionnaire? If yes who are they now and what was the reason for change? Have things improved now?**
   If not has the situation changed since the questionnaire as far as response times?

   All case study schools use their local education authority for ICT technical support covered by a Service Level Agreement. The ICT Support Centre was originally based in one county that has since been split into two separate counties thus making it local for some schools but in an adjacent county for others. This has caused some concern for those schools based outside the county.

   The following comments were made by each school on the subject of improved services:

   A: There were problems with the support provider because of poor service but after confronting the issues they are now very pleased with the support they get, although sceptical the improvement could be due to the large number of purchases they have made recently for the network suite and not as a result of the complaint.

   B: Problems are being dealt with much quicker than the previous year; a technician arrives within 1 or 2 days after the phone call. Although they are very pleased with the service, technicians now refuse to look at other problems if they haven't been logged in the same call. The head appreciates that a tighter controlled system gives better service in the long run.

   C: The technicians are still prompt at responding to problems but they are slow to complete. Managed services are not feasible.

   D: Service has always been good but it seems quicker recently – more staff at the ICT Support Centre but the setup is more complex. There are different departments for software and hardware problems. If a technician

is called out for one job he won't look at any other problems in the same visit if they haven't been logged. Ordering equipment takes a very long time.

E: The ICT technical support provider needs more investment and the head would be willing to pay more, within reason, to help improve the service. Response times are much the same but the service is first class considering the size of the outfit.

F: Callouts used to take at least 2 weeks now they come out pretty quickly because of the network. Previously a printer disappeared for 2 months until they chased it up –now they keep a record of the reference number quoted for the equipment taken away.

2. **Did you know at the time of any alternative technical support providers even though they may not have been available to you? Why did you not choose them?**

A: Aware of some alternatives but afraid to make a change. Looked at possibility of 6 schools employing a shared technician based at one of the schools. The cost of the SLA would cover this as they pay £5,000 and another school pays £9,000 but it depends on the size of the school.

B: No – haven't looked elsewhere because of cost

C: No. She knows of companies that lease equipment but they are too expensive.

D: No – haven't really considered alternatives although talked about having a technician allocated to the school but it would cost too much. At a headteachers' meeting last year plans were discussed to set up a local county equivalent to the shared ICT Support Provider based in the next county but it was agreed to leave things as they are. There appears bias toward the schools in that county for example some of them are aware of follow up sessions to the NOF training whereas this county's schools have not yet been informed.

E: ExpertTech will provide competitive priced hardware and software but they aren't so good with curriculum support. Also aware of Evesham computers but haven't investigated further. Previously bought computers from a private company called Lasergem who support the machines but they don't offer curriculum support.

F: No.

3. **About your technical support contract, what does it include and were there options for differing levels of cover (e.g. extended warranty, phone help, on-site support, callout, pick-up for repair, training).**

A: Blanket cover – no obvious options. Staff development handled separately.

B: Fixed contract.

C: Fixed contract that includes training package.

D: Standard fixed contract.

E: There were no options just a fixed contract which includes callout, telephone support, curricular support and return for repair.

F: Not sure – probably fixed contract.

Equipment situation

4. **Has the number or type of computers changed in school since the questionnaire? How many computers do you have now and what type are they?**

A: Had 13 Windows NT computers and 4 Acorn RISCOS. They now have an ICT suite with 9 machines networked together. Total of 20 PCs. The national ratio is 1:10 but theirs is 1:4.5

B: They have 20 personal computers in total (12 for juniors making 3 per class). They are soon to be networked but space is a problem. They got money for administration from a member of staff and bought a laptop.

C: They have since bought 2 more laptops.

D: They have 7 more PCs and a total of 12 laptops for teachers (3 more than before).

E: One computer per classroom with internet access - at least Windows 98. Now has a network suite with 14 computers. Used GEST funding to buy 3 - 750 Durons at £500 each with 17in monitors and speakers and printer for £70. Bought extra contract to cover these machines. Planning to get a computer from The Welsh Resource Centre for school use.

F: Now have 12 PCs networked in a computer room. Ordered 6 new PCs to be delivered in January funded by the PTA.

Has old equipment been replaced or new equipment bought to supplement?

A: Still has old Acorns but will phase out keeping one back as it has equipment attached

B: Cannot replace all Acorns as they are needed for the control systems recommended by the ICT Support Centre (7000s used for sensors). Worried about what will happen when these computers break down as they cannot be replaced.

C: Old equipment is still well used. The A3020s are used for control and the A7000s have lots of good software so it would be too expensive to replace them all with PC versions.

D: They still use Acorns as they have Welsh software on them. They also have monitor and control and database programs on them. No intentions to get rid of them.

E: Only use 2 of the old Acorn computers – others to be stored away

F: They still have and old WOMPI project computer and 10 Acorns that are being phased out because it is hard to get software for the floppy disk machines.

5. **What alternatives are available to you when choosing an equipment supplier and what influences your choice (e.g. LEA, budget, location, post sales technical support or extended warranty, need for curriculum support?).**

A: The ICT Support Centre offer a very competitive price – too lazy to look elsewhere.

B: The ICT Support Centre offer competitive prices and give contract cover so they don't buy elsewhere.

C: The ICT Support Centre influence choice because of support and training but they do use Tesco vouchers and buy Welsh software. Leasing is not an option.

D: Always buy from the ICT Support Centre. Also use Tesco vouchers as computers are supported by the ICT Support Centre.

E: Cost is always the main consideration – the ICT Support Centre are very competitive but restricted choice of hardware – Mertec and Toshiba. They also send out regular information sheets with latest offers at very competitive prices. The ICT Support Centre will sometimes agree to support other equipment.

F: They get a price list sent by the ICT Support Centre and prices are competitive. They don't buy elsewhere because they wouldn't be covered by the ICT Support Centre contract.

6. **Are you connected to the internet? Who is your internet service provider – via Baglan or independent? How often does the school use it, what for and do you have any problems? Describe.**

A: Connected to the internet through the ICT Support Centre. Used daily. Don't find a problem with response times

B: Yes connected to the internet via the ICT Support Centre. Can be very slow but they are having broadband installed soon

C: Connected to the internet in Phase 3 but can't use it as server has had constant problems so couldn't plan to use it in lessons. Connected via NTL paying them directly for use – server was supposed to drop the link at 6pm but often stayed on-line overnight costing them for use. Other schools have had this problem.

D: Yes using BT line via the ICT Support Centre. Very good to use – no problems encountered.

E: Were connected to the internet in April/May 2001 - one of the last schools to be done but have benefited by getting the latest server. Connected via the ICT Support Centre with very few problems and every class has internet access

F: Connected to internet via the ICT Support Centre – received training in March. NOF training 75% completed. Computer suite is all linked so are junior classrooms.

7. **Do you have any networked computers and if so what problems do you have?**

A: Network suite with a few minor teething problems. The ICT Support Centre will talk the head, in his role as ICT co-ordinator, through trying to solve problems but they have to come out to fix if that doesn't work.

B: Computers aren't networked yet as there isn't room for a network suite anywhere in the school. There is a computer (donated by Ford) linked to the one in the secretary's office just outside the room allowing teachers to update assessments without disturbing her work.

C: No room available for network suite.

D: No as there is nowhere to put one

E: Network suite with 14 computers and print server – had faulty server repaired back at the ICT Support Centre. They are usually efficient. Head not sure if they own the server or not.

F: Network suite in a computer room. Problems are dealt with quickly by the ICT Support Centre.

Software Support

8. **Do you have separate software support or is it included in hardware support contract?**
How do you sort out software problems that aren't covered by a support contract?

A: The ICT Support Centre deal with software problems. With software bought elsewhere they haven't had any problems.

B: Included in the ICT Support Centre contract. The head is the ICT co-ordinator with experienced in IT and can also sort out a lot of problems herself. Will buy other software and support it themselves.

C: Software support covered by the ICT Support Centre contract. They need to identify what the cause of the problem is – hardware, software or server before they call out someone as problems are handled by different staff and only one will come out.

D: The ICT Support Centre help with software problems – also get phone helplines with some packages

E: Use the ICT Support Centre as it supports the packages it sells. Off the shelf packages usually have a phone number for help although the head is quite proficient with most software.

F: Software supported by the ICT Support Centre

9. **Have you changed the software you use and for what reason?**
Do you feel restricted in your choice of software -why? (cost, suitability, support).

A: Microsoft charge £25 per computer for a license which is too expensive. The head as ICT co-ordinator does buy software from sources other than the ICT Support Centre.

B: The head as ICT co-ordinator confidently buys non-curriculum software off the shelf which isn't supported by the ICT Support Centre.

C: Bought a lot of software before an inspection last year so haven't bought any more recently. Cost is a problem especially for site licences

D: Upgraded the Desk Top Publisher. Not enough Welsh Software available especially at infant level. More coming out from Granada?

E: The ICT Support Centre offers only certain packages so they are limited to choice but will buy off the shelf software if required.

F: Had to buy a package (Logo) to do the ICT Support Centre in-house training but don't use it yet. Cost of software restricts purchases. Lack of software; mainly use Textease.

ICT Co-ordinator

10. Who is your ICT co-ordinator – a long standing member of staff, newly qualified teacher, non-teaching person especially recruited for the job?

A: ICT co-ordinator left recently and the head has taken on the responsibility.

B: The current head was the deputy head and the ICT co-ordinator but was promoted to head recently and kept the role. A new deputy head has been appointed to start in January taking over role as ICT co-ordinator. She built her own web site at her previous school.

C: The ICT co-ordinator was a newly qualified teacher joining the school with an interest in IT and the head was reorganising staff roles so the previous co-ordinator stepped down to allow her to do the job. As there are only 4 staff in the school they each have 2 or 3 co-ordinator roles to perform anyway.

D: Long standing member of staff.

E: Long standing member of staff.

F: ICT co-ordinator was also deputy head but is now on long term sick – probably won't be back. No-one reappointed yet – standing in only.

11. How was the person chosen – volunteer, best person for the job, specially trained?

A: Best person for the job.

B: The head trained herself up in IT on courses outside school as she realised it was an essential skill. She was therefore the best person for the job. The new deputy will become the ICT co-ordinator as she has good IT skills.

C: She was the best person for the job.

D: Best person for the job.

E: She volunteered as no-one else would consider doing it.

F: A nursery teacher interested in IT volunteered to take over responsibility temporarily when the ICT co-ordinator/deputy head went on long term sick.

12. **How do you think your ICT co-ordinator copes with technical support with regard to their training and skills? Do they have sufficient support themselves?**

A: The head as ICT co-ordinator copes extremely well. He is self taught and has a flair for the subject. Their ICT Support Centre are prepared to talk him through dealing with some problems.

B: She copes very well having been on training courses, has a keen interest and has a computer at home. Expects new ICT co-ordinator to cope extremely well.

C: She copes very well and is very interested to learn more. She is not afraid to try and sort out problems and has support form the previous ICT co-ordinator in the school. She also feels well supported by their ICT Support Centre.

D: Copes very well with support from their ICT Support Centre and has a helper in the infants department as it is a large school.

E: Head does most of the support. ICT co-ordinator's strength is with the older Acorns but she can sort out basic problems with the newer computers and asks for help when needed. More INSET is required to keep her up to date with newer technology.

F: The covering ICT co-ordinator tries her best but doesn't feel skilled enough to do the job long term. There is an NVQ ITEC student there on a Skills Building Course who is very capable and communicates successfully with their ICT Support Centre – they talk her through most problems, but school can't take her on as position has to be filled by teaching staff.

13. **Do they have a non-contact time allowance to deal with problems (how much) or is it an extra responsibility for them. How do they cope with this on a day to day basis.**

A: As non-teaching head he does not have contact time so he is always available.

B: As head she doesn't have fixed contact time so it isn't a problem.

C: School too small – have to fit in around class times – usually break or lunch time. There is no staff cover for it to be done immediately.

D: Large busy school with no time allowance – fixes problems in break time or after school. Gets teachers to list problems so they can all be looked at together.

E: No allowance – done in her own time or has to find cover to leave the room to fix urgent problems. School copes quite well as the head can deal with most problems.

F: No time allowance, difficult to fit in as you just can't leave the classroom. At the moment with the ITEC student there is a useful extra person to help solve problems

14. If you had no restrictions how would you like your technical support to be handled?

A: Cluster schools together in regions and have an area manager for each sector within the ICT Support Centre. A lot of heads he knows are young males with a natural enthusiasm and interest in IT.

B: Leased computers with cover so they can be kept up to date and a Technician on site

C: The school belong to the Gower Consortium – a private group of Gower schools' ICT co-ordinators (not unique to Gower) who meet together for talks and seminars to help each other with problems. They have discussed leasing but it is not suited to them and considered employing a technician to share between these schools but nothing has been followed up.

D: Personal technician for the school.

E: There is no need for a full time technician in primary schools so maybe 1 day or 3 half days of a qualified technician would be useful although problems don't happen to plan so the arrangement would need to be flexible. Have discussed the possibility of a cluster of 5 schools sharing a county technician but this hasn't got any further. Have also attempted to arrange borrowing or sharing a High School technician but the schools asked (Dynevor and Dylan Thomas) were not interested.

F: Someone to be on call for niggly problems like the ITEC student would be useful. Also the school needs a deputy head as well as an ICT co-ordinator so an ICT literate deputy head would be a good solution.

Current problems and solutions

15. Do you have a procedure for sorting out technical problems and is there paperwork to monitor and record the progress of a problem?

A: The head as ICT co-ordinator is the first contact point for problems and he uses their ICT Support Centre's Call references to record the problems

B: Yes – the call reference from their ICT Support Centre is recorded in a book with details about the problem so the secretary can handle it if the head as ICT co-ordinator is unavailable

C: There is no definite procedure but she makes a note of the their ICT Support Centre call reference to follow it up.

D: Makes a note of their ICT Support Centre call references for follow up. All problems come via Karen the ICT co-ordinator.

E: Their ICT Support Centre give a call reference for each call logged by them to monitor progress so a record is made of this to follow it up – can be different style depending on problem

F: The ITEC student handles calls to their ICT Support Centre and records the Call Reference number to use for chasing up repairs

16. Does the ICT co-ordinator try to deal with problems themselves or just contact their technical supporter?

A: The head as ICT co-ordinator deals with problems himself and calls for help as last resort.

B: Yes – deals with problems unless help from the ICT Support Centre is needed.

C: She tries to fix most things herself and calls the ICT Support Centre for help when needed.

D: ICT co-ordinator tries to fix problems first and then rings the ICT Support Centre.

E: Staff member asks ICT co-ordinator or the head whoever is available but no record is made of problem. Their ICT Support Centre is called as a last resort these days since the new head arrived.

F: The ITEC student is the first person to be asked for help at the moment; then they ask the covering ICT co-ordinator and then the supply teacher. Their ICT Support Centre is called as a last resort.

17. **Please can you give me some examples of problems that have occurred lately- how were they handled?**

A: Problems with using Internet Explorer after Netscape had been installed originally. Network printer would not respond to two of the PCs in the suite.

B: Digital camera faulty – taken away for repair. Internet access problems and very slow. Monitor problem. Mice break frequently.

C: Problems with server. Also a problem with sticky ON/OFF buttons and keyboards sticking.

D: Printer and camera problems – sent back for repair. Floppy disk stuck in drive

E: Recently had a server installed with lots of problems – callouts were answered more quickly by top guy as problem continued – eventually returned to base for rebuilding. A print server was installed recently but they had problems with sending prints to it – their ICT Support Centre came out a few times but they can now fix it themselves by resetting the system. A CD drawer was pulled out of a PC and that went back for repair.

F: Printers not working on the Acorns. Internet not accessible because of the server. Internet is very slow because they go through their ICT Support Centre to filter content – often get timed out of the BBC site and have to retry.

18. **Generally how long does it take to sort out a problem?**

A: Days not weeks, usually 3. Generally sorted out straight away.

B: If taken away can take two weeks.

C: Calls are answered promptly but it can take a week to get someone to come out. If the equipment is taken away for repair it can take another week to get it back

D: Someone comes out within a week – if taken away then 1-2 weeks.

E: Most problems take about a week to be completed but has taken 3 weeks to send a machine away for repair.

F: Can be straight away on the phone – the ITEC student can understand the problems well enough to explain to their ICT Support Centre and she can interpret the response. If equipment is taken away it can take a while to return –the covering ICT co-ordinator can drop off things as she lives in Port Talbot. The ICT Support Centre come out to fix any network problems.

19. Is there a deputy to cover the ICT co-ordinator when they are unavailable?

A: No – they would phone their ICT Support Centre direct.

B: Yes. Y5 and Y6 belong to a computer club and have formed an IT Squad – they watch the head as ICT co-ordinator fix problems and learn from her so they can do it themselves next time. They are taught to perform routine tasks and can fix common problems to help out.

C: No.

D: Yes – in the infant department.

E: The head solves most problems and there are others who can help too.

F: There are an ITEC student and a supply teacher who are usually on-hand to help.

20. What software problems have you had recently and how did you organise a solution.

A: None.

B: (No answer)

C: Problem with Textease crashing because of conflict of versions being run – engineer called out to help sort out problem

D: Helplines available with some software packages or phone their ICT Support Centre who get back to them.

E: Don't get many problems with software that the head can't solve himself or a quick phone call to their ICT Support Centre can't fix. Last problem was with First Find It trying to save a file but the teacher was doing it wrong – the NOF trainer was at school and helped sort it. Most problems can be fixed with a phone call or they will phone back within 2 days.

F: They have a lack of software. Mainly use Textease and had to buy Logo for training

Training and Inset days

21. Who provides your computer training for the computer and the software?

A: The ICT Support Centre provide software training but nothing technical. NOF training is good for beginners but it includes no skills teaching and

nothing technical. The head as ICT co-ordinator also runs his own in-house training sessions for the staff.

B: Their ICT Support Centre. The heads have special training days in administration as part of SLA contract. Also use the Welsh Centre based in St. Helen's School for Welsh as a second language – advisory teachers for IT in Welsh. The head as ICT co-ordinator has organised an INSET day for after Christmas at school run by herself.

C: NOF, their ICT Support Centre and the ICT co-ordinator. Sometimes they have guest speakers or training sessions with the Gower consortium.

D: The ICT Support Centre. The NOF training was excellent – the co-ordinator helped a lot.

E: Only recently started NOF training – in the last batch. Provided by their ICT Support Centre although the head holds his own training sessions when he feels they need one.

F: Their ICT Support Centre hold training days where the teachers can see what other software is available as the school doesn't have relevant packages. Training sessions are organised by a supply teacher on an ad-hoc basis with the help of some parents.

Is training provided at the school or do you visit the training provider?

A: The ICT Support Centre have training days that you book staff onto but then you have to pay for cover for them to go. The ICT Support Centre do come to the school but charge by credits which are allocated to the school depending on number on roll. NOF training is done at the school – good for beginners but no skills are taught –more like an assessment – good for them as they have an assessment after Christmas.

B: Both. The school has 8 credits per year from their ICT Support Centre and it costs 4 per day for training. This is nowhere near enough for a whole year as ICT develops so quickly and systems are dated before the staff get to use them. Also it is expensive to get cover for staff to go on training. GEST funding is available to the school. NOF training is complete but they were misled – thought it was training sessions but turned out to be more like an assessment. TILT training from government is very good – impressed with the equipment loaned to teachers to learn on.

C: Both. Depends on time available and credits allowed which can be used for INSET or in class training. Need supply to cover if during class time.

D: Both – have credits for INSET so it is flexible – either on-site or off.

E: At their ICT Support Centre for NOF and at school for in-house sessions

F: When their ICT Support Centre come to the school they charge 16 credits for 2 people to come for a day – different staff have different "values" and a ratio of 1:8 per group. 16-20 credits are allocated per year. When they come for training the teacher has to have cover unless it is an inset day but it is more beneficial for them to be taught on their own equipment. Currently undergoing NOF training (by their ICT Support Centre) at school but it is just like an assessment not actual training.

22. What do you consider to be the training needs for the ICT co-ordnator and members of staff who need to use computers?

A: (No answer)

B: In the New Year the new ICT co-ordinator is going to send a questionnaire to all the teachers to assess their training needs in ICT. There is to be an INSET day first day back.

C: Training from their ICT Support Centre is good enough

D: NOF was successful but needs to be followed up with more training for staff to improve skills. Weakness with Find It and monitor & control

E: The ICT co-ordinator was very experienced with the older equipment but not so familiar with the newer machines – could benefit from some up to date training. The head is an experienced ICT person and handles most problems himself.

F: The school needs to appoint an ICT co-ordinator as they wouldn't pass an inspection with the current situation. The ITEC student is there on a placement for her NVQ Skill Building course which could take 3 months – 3 years.

APPENDIX D

DATA TABLES

D. 1 DISTANCE FROM SUPPORTER

Size	Distance		Given Miles	Calculated Miles	Problem	Description of problem
Small	Far	1	15.0	.	No	
		2	.	12.5	No	Equipment taken quickly
		3	14.0	.	No	
		4	12.0	.	No	Not usually
		5	20.0	.	No answer	
		6	.	17.0	No	
		7	16.0	.	No	Not a problem
		8	10.0	.	Yes	Time taken for visits/repair
		9	.	41.0	No	
		10	.	40.0	No	
		11	10.0	.	No	
		12	15.0	.	No	No problem as they come to the school
		13	20.0	.	No	No problem
		14	20.0	.	No	No problem
	Near	1	.	9.5	No	
		2	2.0	.	No	
		3	.	6.0	No	Short distance
Large	Far	1	10.0	.	No answer	
		2	18.0	.	Sometimes	It can be a problem
		3	.	12.0	Yes	Often don't come for several days
		4	.	16.0	No	Response time the only problem
		5	10.0	.	No	
		6	.	14.0	No	Response time more of a problem
		7	.	12.0	Yes	Have to send equipment to them
		8	10.0	.	Sometimes	Depends how busy they are
	Near	1	.	5.0	No	No major problem
		2	.	8.5	No	Not really - engineer lives near school
		3	.	8.0	No	
		4	.	9.0	Sometimes	Sometimes delays due to excessive demand
		5	6.0	.	No	
		6	.	7.0	Yes	
		7	.	5.0	No	local
		8	.5	.	No answer	
		9	8.0	.	No answer	
		10	2.5	.	No answer	
		11	5.0	.	No answer	
		12	.	9.5	No	Not too much of a problem

D. 2 CODED RESPONSE TIMES

Response times quoted	Coding
1-3 days	Days
up to month	Weeks
half day	Day
few days	Days
1-2 days	Days
weeks or months	Weeks
3 days	Days
1-2 weeks	Weeks
Within 24 hours	Day
Next day	Day
Within 7 days	Days
Day to 2 weeks	Weeks
3 weeks	Weeks
2-3 days	Days
Within week	Days
1day - 1 month	Variable
2 days -3 weeks	Variable
Within 2 days	Days
1 - 2 weeks	Weeks
At least 3 days	Days
Same week	Week
7-14 days	Weeks
few days- 2 wks	Weeks
taking longer	Variable
weeks - months	Months
1 week	Week
10 days	Weeks
up to 3 weeks	Weeks
good	Days
up to 6 months	Months
Within a week	Week
48 hours	Days
3 days	Days
1 week	Week
1week - 3 month	Variable
5-7days	Days
within 2 weeks	Weeks

D. 3 TECHNICAL SUPPORT DUTIES

Extent of technical Support	Coding
SW and HW problems if possible	Yes
Limited by experience and knowledge	Yes
Early days so lots of help needed	Yes
Day to day problems/support	Yes
After school or lunchtime INSET	INSET
No	No
No	No
Attempt to get system up and working	Basic/limited
Basic check system setup and software	Basic/limited
Limited to simple problems	Basic/limited
Asked first before Baglan	Yes
No - contact Baglan	No
All problems except hardware faults	Yes
Limited	Basic/limited
Covers on-site initial problems	Basic/limited
SW install and use, add peripherals	Yes
Day to day support minor problems	Basic/limited
Partly	Basic/limited
To extent of ability of co-ordinator	Yes
Basic - setup computers and install SW	Basic/limited
Not to a great extent - passed on	Basic/limited
Limited extent, not qualified, Baglan	Basic/limited
Check equipment, setup, order and add SW	Yes
No ICT co-ord appointed yet	
If not resolved call support	Yes
INSET to limit of co-ord expertise	INSET
No	No
No	No
Not supposed to be technicians	No
Allowed 1.5 hours per week for duties	Yes
No	No
No	No
No	No
If able to fix problem	Yes
Subject to personal knowledge	Yes
Limited - trouble shoot HW/SW problems	Basic/limited
Only for simple queries and problems	Basic/limited