



Open Source Software in Schools

A case study report

May 2005

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Introduction

This report examines eight case studies of schools included in Becta's Open Source Software in Schools project, funded by the DfES. It identifies the ways open source software (OSS) has been incorporated, used and managed in school ICT infrastructures. It also presents the perceptions of schools' senior management teams (SMTs), teaching staff and pupils about the impact and use of OSS.

The schools in the case studies were selected to represent the broad range of schools covered in the project. Four primary and four secondary school case studies were compiled from interviews with staff and pupils. These were examined to identify trends that may highlight how OSS is being used.

A full cost analysis of the project is given in the project report 'Open source software in schools: a study of the spectrum of use and related ICT infrastructure costs'. There is also a summary document. Both are available from the Becta publications website [<http://www.becta.org.uk/publications>].

Background

There are many different models of software licensing in the commercial sector, which present a complex set of choices to schools when purchasing, replacing or upgrading ICT equipment. Commercial licences for proprietary software in schools are generally charged on a computer, user or site basis.

In order to fully explore the contribution that OSS can make to the education sector, the Open Source Software in Schools project has three aims. These are to:

- examine how well the OSS approach works in practically supporting delivery of the curriculum and administrative management in schools, and the degree to which OSS currently in use is effective and provides adequate functionality to the educational user
- compare the total cost of ownership of using OSS with the total costs of non-OSS solutions, including the hidden costs associated with using any software in schools, eg user self-support
- highlight examples of successful school-based OSS implementations through case studies.

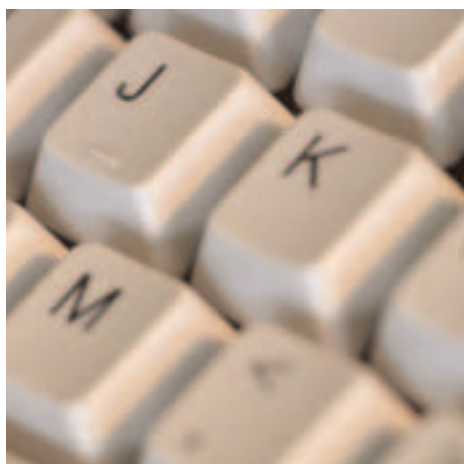
Methodology

Fifteen schools, across England, with an open source element in their ICT infrastructures, were selected for the project. To ensure the case studies reflected the diverse use of OSS in schools, eight schools were selected to represent a broad range of environments.

Case study data was collected during visits to schools, where interviews were conducted with members of the SMT, the network manager, teaching staff and pupils.

Open source software (OSS) has been defined (by Becta) as:

'software for which the underlying programming code is available to the users so that they may read it, make changes to it, and build new versions of the software incorporating their changes. There are many types of open source software, mainly differing in the licensing term under which altered copies of the source code may be redistributed.'



Summary of findings

The main findings are summarised below. Full case study reports for each of the schools follow.

Motivation

Six of the eight case study schools identified that their main driver for introducing OSS was the potential cost saving. Of those, three primary schools also stated that the technical support provided free of charge by the high school in their cluster was an important factor in their decision. Two of the case study schools stated they had also saved costs by using open source operating systems and thin-client networks to extend the life of old computers.

Other reasons reported for introducing OSS were its transparency and flexibility, and the educational value of providing pupils with a broader experience of operating systems and software.

Barriers

The main barriers to using and implementing OSS were stated as incompatibility with some curriculum software, inability to read files created in other applications, and lack of familiarity with the software and resistance to its use from teachers and pupils.

Networks

Seven schools used an open source operating system (Linux) on their servers and operated a client-server network. Secondary schools with larger networks also had Microsoft and Novell servers for specialist software such as school management information systems (MIS) or anti-virus software. The remaining school operated a peer-to-peer network.

Two schools used an open source operating system (Linux) on all their computers. Three used a mixture of Linux and Windows, and computers at the remaining three schools were wholly Windows. Many of the computers were dual platform, allowing the user to run either Linux or Windows, depending on the functionality required.

Computer software

Five schools had the open source productivity software StarOffice¹ installed on all or most of their computers. In the other three schools an OSS alternative, OpenOffice, was used. However, Microsoft Office was also present on the majority of computers in all schools.

A range of different OSS was installed throughout the schools, the most popular being IrfanView, Crocodile Clips, the GIMP, Audacity and Mozilla. Details of these packages can be found in 'Open source software in schools: a study of the spectrum of use and related ICT infrastructure costs'.

Distribution of OSS provision in case study schools:

Case Study	Category	Phase	Operating system		Applications	
			Server	Computer	StarOffice ¹	OpenOffice
1	Full spectrum ²	Primary	100%	100%	100%	0%
4	Full spectrum	Primary	100%	100%	100%	0%
8	Full spectrum	Secondary	60%	33%	0%	100%
5	Server plus applications	Secondary	100%	20%	100%	10%
2	Server plus applications	Primary	100%	0%	100%	0%
3	Server plus applications	Secondary	86%	20%	0%	90%
7	Server plus applications	Secondary	70%	0%	0%	100%
6	Applications only	Primary	0%	0%	75%	2%

¹ StarOffice is not 'open source' in the true sense of the definition, but it is considered part of this category as it is an inexpensive alternative, and has a number of open source components.

² Full spectrum schools are those that use more than the threshold value of 30% OSS for server and computer operating systems and also for computer applications.

Perceptions

Senior management team

The SMTs from seven schools stated cost saving as an advantage of using OSS. Three schools said the savings from using OSS had allowed them to spend money on additional support and hardware. Six schools also thought that the reliability and security of OSS was an advantage. One school stated that the transparency of OSS was more important than cost saving as they found it advantageous to alter it to their needs.

Head teachers

Two head teachers thought that OSS allowed their pupils to broaden their ICT knowledge and avoid becoming wholly dependent on application-specific skills. Other head teachers were concerned about the difficulties of replacing staff skilled in the management and support of OSS.

Teachers

Teachers in all case study schools seemed positive about using OSS on the computers. Teachers from four schools thought that OSS applications (mainly OpenOffice and StarOffice) were easy to use, and three teachers thought OSS was more reliable than equivalent non-open-source applications.

Pupils

Overall, pupils in all schools liked using OSS, although some issues highlighted were lack of familiarity with OSS and the effort required to learn how to use it.

Parents

One school offered parents the opportunity to use OSS by attending sessions where they worked alongside pupils. A CD-ROM with the OSS was made available to parents for a nominal fee. This led to a number of parents using OSS at home and enrolling in evening classes.

Open Source Software in Schools

Case study 1

Type of school	<ul style="list-style-type: none"> • Small rural primary school • 103 pupils aged 3–11 years • Recognised by the LEA as a highly effective school 2003–04 									
Open source use	<table> <tr> <td>Server</td> <td>100%</td> </tr> <tr> <td>Computer</td> <td>100%</td> </tr> <tr> <td>StarOffice</td> <td>100%</td> </tr> <tr> <td>OpenOffice</td> <td>0%</td> </tr> </table>		Server	100%	Computer	100%	StarOffice	100%	OpenOffice	0%
Server	100%									
Computer	100%									
StarOffice	100%									
OpenOffice	0%									
ICT in the school	<ul style="list-style-type: none"> • The school aims to introduce data projectors and interactive whiteboards. • It is anticipated that all teachers will have laptops and be able to teach with them. • Technical support for the infrastructure comes from the ICT manager at the high school. • The head teacher had previously taught in an OSS school, so introduced it to this school on arrival. <ul style="list-style-type: none"> • The main drivers for introducing OSS were cost and the support provided by the ICT manager at the high school. • The LEA provided a grant for ICT development, which helped with initial ICT set up, but does not support the school in its use of OSS. 									
Overview of hardware and software	<ul style="list-style-type: none"> • The school has a client–server network with one server running Linux (Mandrake). • All the curriculum computers use the Linux operating system. <ul style="list-style-type: none"> • The OSS applications used on the computers are StarOffice, IrfanView and Crocodile Clips. • Non-open-source applications used are Microsoft Office, Key Solutions and Integris. 									
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • Head teacher finds that the advantage of using OSS is that computers ‘freeze’ less often. • There are considerable cost advantages with using OSS. <ul style="list-style-type: none"> • The school receives good network management support from the high school’s ICT manager. • The only disadvantage is that some curriculum software applications will only run on Windows. 									
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The head teacher is delighted with the ICT provision the school has now, and attributes the success of its most recent Ofsted inspection with regard to ICT to Linux. • OSS has saved the school money, which has been used to pay for a part-time ICT teaching assistant <p>who teaches ICT to pupils, so the use of OSS is indirectly raising standards.</p> <ul style="list-style-type: none"> • OSS seems more reliable than Microsoft software, and the school has excellent support from people with superb OSS expertise. 									
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • A teaching assistant was not aware of the term ‘open source’, and knew nothing of Linux, but was well aware of the differences between StarOffice and Microsoft Office. • The teacher and teaching assistant appreciate having both StarOffice for straight text processing and Microsoft Word where they use WordArt for preparing display materials. • Pupils using Microsoft applications at home need to develop familiarity with StarOffice as well, but they seem to be able to pick it up very quickly – even the younger ones. <ul style="list-style-type: none"> • A school administrator seemed somewhat hostile to StarOffice, because Microsoft Office had been used for some years. • An administrator pointed out that most files are received in Microsoft Office format and they didn’t think that StarOffice would be compatible with everything they receive. 									

Case study 2

Type of school	<ul style="list-style-type: none"> • Medium-sized rural primary school • 231 pupils aged 3–11 years • It is an effective school where the strengths far outweigh the weaknesses 									
Open source use	<table> <tr> <td>Server</td> <td>100%</td> </tr> <tr> <td>Computer</td> <td>0%</td> </tr> <tr> <td>StarOffice</td> <td>100%</td> </tr> <tr> <td>OpenOffice</td> <td>0%</td> </tr> </table>		Server	100%	Computer	0%	StarOffice	100%	OpenOffice	0%
Server	100%									
Computer	0%									
StarOffice	100%									
OpenOffice	0%									
ICT in the school	<ul style="list-style-type: none"> • The head teacher would like to continue to build on the existing ICT provision, and provide and build upon good training for the staff so that their skills are imparted to the pupils. • It is intended that the pupil : computer ratio should continue to be improved, on a rolling basis. There is an intention to get more appropriate ICT into the foundation/early years end of the school. • Technical support for the infrastructure comes from the ICT manager at the high school. <ul style="list-style-type: none"> • Support for the curriculum use of ICT and day-to-day problems comes from the ICT co-ordinator and an advanced teaching assistant. • Cost and the enthusiasm of the high school ICT manager were the primary drivers for introducing OSS. • The head teacher feels that the LEA is not offering the school a choice for its administrative systems, and only provides support for non-OSS products. 									
Overview of hardware and software	<ul style="list-style-type: none"> • The school has a client–server network with one server running Linux (Mandrake). • There is one computer suite, and there are two 'mini suites' of half a dozen computers and other computers in classrooms. The Windows operating system is used on these computers. <ul style="list-style-type: none"> • The OSS applications used on the computers are StarOffice and IrfanView. • Non-open-source applications used are Microsoft Office, Key Solutions and Integris. 									
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • The head teacher reports that the lower cost is the main advantage of using OSS, which has resulted in the school being able to improve the pupil:computer ratio and spend money on technical support to keep everything running. • No disadvantages were noted. 									
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The head teacher reports that the current ICT provision is helping the school to do well at meeting current needs. • In the long term, the school wants children to be able to make their own choices about their learning, rather than for them to think there is only one prescribed path to take. OSS helps the school put this philosophy into practice. • The use of OSS relates to the school's long-term objectives of teaching children to be flexible and independent users of ICT, and not wholly dependent on application-specific skills. • Lower costs mean that the school has been able to provide a full range of software tools sooner than would have been possible otherwise. • OSS is seen as more stable and therefore needing less support. 									
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • A teaching assistant believes that it is easy to teach children how to use OSS, because they feel they know about "more than just Microsoft". • Teachers commented that, because OSS is free, pupils can use it at home too – with no costs incurred. • Teachers also commented that, with StarOffice, you decide what you want to do – Microsoft applications tell you what to do. OSS is as easy, if not easier, than anything else. • If you are already familiar with Microsoft software, then the differences with using OSS have to be addressed. 									

Open Source Software in Schools

Case study 3

<p>Type of school</p>	<ul style="list-style-type: none"> • Medium-sized rural secondary school • 712 pupils aged 11–18 years • The school is the first all-girl school in the country to be awarded specialist engineering status 									
<p>Open source use</p>	<table border="0"> <tr> <td>Server</td> <td>86%</td> </tr> <tr> <td>Computer</td> <td>20%</td> </tr> <tr> <td>StarOffice</td> <td>0%</td> </tr> <tr> <td>OpenOffice</td> <td>90%</td> </tr> </table>		Server	86%	Computer	20%	StarOffice	0%	OpenOffice	90%
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Computer	20%									
StarOffice	0%									
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<p>ICT in the school</p>	<ul style="list-style-type: none"> • The school aims to move to a situation where all teachers and students have “anytime, anywhere” access to IT – this means access both in lessons and at home. • The SMT sees online learning as important because it extends what the school is able to do. • New systems introduced into the school will run OSS – so its use will increase. • Maintaining the strategic ICT overview is the responsibility of the deputy head teacher, along with the ICT co-ordinator. • The ICT manager provides day-to-day support and 	<p>trouble-shooting, although 20% of his time is allocated to teaching.</p> <ul style="list-style-type: none"> • Cost was the main driver for introducing OSS, as OSS was the cheapest way to move the school’s ICT provision forwards. Setting up a thin-client network enabled the school to make good use of legacy machines, and thus equip the sixth form computer room, which would not otherwise have been possible. • The LEA provides no ICT support to the school, and some animosity has grown over the issue of the school using OSS. 								
<p>Overview of hardware and software</p>	<ul style="list-style-type: none"> • The school has a client–server network, with the exception of the sixth form computer room, which uses thin-client networking to make best use of older equipment. • All servers run Linux, except two Microsoft servers running SIMS and Sophos anti-virus software. • Computers in one computer room run Linux all the 	<p>time; other computers, including those in the two other computer rooms, all run Windows.</p> <ul style="list-style-type: none"> • The newest computers are a trolley of laptops – these run Windows XP and OpenOffice. • OpenOffice is available on over 90% of the school’s computers. Other OSS used includes the GIMP, Audacity and pdfcreator. 								
<p>Advantages and disadvantages of using open source software</p>	<ul style="list-style-type: none"> • The advantages of using OSS really centre on cost. The school has decided not to use Microsoft Office because it is expensive, not because it is unpopular. • The benefits of OSS on curriculum delivery are indirect – because OSS is cheaper, money can be spent elsewhere. • The ICT manager thinks OSS is more reliable, and good immediate support is available from the online OSS community. • Linux is seen as far more secure, for instance it is less 	<p>open to virus attack than Microsoft alternatives.</p> <ul style="list-style-type: none"> • The main disadvantage of OSS is that there is some resistance from students to the use of OpenOffice due, in part, to the power of the Microsoft brand. • Senior managers believe that, at least for now, the school will need to “keep a foot in both camps”. Since there is a wide expectation that Microsoft products will be available everywhere, certain tools are developed which will only work if Microsoft products are installed. 								
<p>Perceptions of senior management on the use of open source software</p>	<ul style="list-style-type: none"> • The head teacher reports that the ICT provision has come a long way recently – from one computer suite to four in two years. • The thin-client networking does limit the software that can be run. Even with some issues, the thin-client setup enabled the school to get some use out of computers which would have otherwise have been thrown out. 	<ul style="list-style-type: none"> • OSS is free, so savings can be ploughed straight back into investment in further teaching and learning tools. • One problem with using OSS and Microsoft applications is that pupils may need to learn how to operate both – this can lead to some disaffection. • Some classroom tools rely on systems having Microsoft products installed – this can limit the software that it is possible to use. 								
<p>Perceptions of teachers and pupils on the use of open source software</p>	<ul style="list-style-type: none"> • Teachers in general are aware of the cost and licensing issues around the use of OSS. • Teachers like the fact that OSS can be installed anywhere – for instance given to students to take home. • Some teachers advise that OSS is fine to use and there are no real issues in terms of ease-of-use. • There are some file-incompatibility issues. OSS tends not to be as ‘finished’ as commercial software – the interface is less ‘polished’. • One of the pupils uses OSS at home and finds it easier than using Microsoft products. Pupils advise 	<p>that having to find your way around new software needs some time and instruction at first. For many pupils, brief familiarisation sessions are not enough.</p> <ul style="list-style-type: none"> • Some pupils use Hotmail to send work as email attachments between school and home. For basic text processing, moving from Microsoft Word to OpenOffice is not a problem, but with more sophisticated documents, pupils would seek out a school computer with Word to continue with something they were using Word for at home. 								

Case study 4

Type of school	<ul style="list-style-type: none"> • Small rural primary school • 85 pupils aged 4–11 years • The school is popular and over-subscribed 									
Open source use	<table> <tr> <td>Server</td> <td>100%</td> </tr> <tr> <td>Computer</td> <td>100%</td> </tr> <tr> <td>StarOffice</td> <td>100%</td> </tr> <tr> <td>OpenOffice</td> <td>0%</td> </tr> </table>		Server	100%	Computer	100%	StarOffice	100%	OpenOffice	0%
Server	100%									
Computer	100%									
StarOffice	100%									
OpenOffice	0%									
ICT in the school	<ul style="list-style-type: none"> • The head teacher would like to see increasing co-operation between the cluster of schools in the area. Continuity, for pupils, with the high school will be increased so that they will log on to the network in exactly the same way whether they are at one of the primary schools or the high school. • Technical support for the infrastructure comes from the ICT manager at the high school. • On a day-to-day basis, support is provided by the school's administrative officer who manages pupils' log-ons and password allocation. <ul style="list-style-type: none"> • The main reason for introducing OSS is cost and the conviction of the high school's ICT manager that it was the right way to go. The switch to OSS was not carried out without "some anxiety", but it has been worth it. • Some LEA support came in the form of small-school grants for connecting the cluster schools together, but there has been no overt support for the school's use of OSS. 									
Overview of hardware and software	<ul style="list-style-type: none"> • The school has a client-server network with one server running Linux (Mandrake). • It has one computer suite and other computers placed in classrooms. Linux is used on these systems 80% of the time. <ul style="list-style-type: none"> • The OSS applications used on the computers are StarOffice and IrfanView. • Non-open-source applications used are Microsoft Office, Key Solutions and Integris. 									
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • The main advantage of using OSS is the continuity with the high school. • The stability and reliability of OSS has been great – the school can (and has) operated for weeks with no need for intervention. <ul style="list-style-type: none"> • The school feels that the cost of OSS is definitely lower, which has enabled crucial spending on more workstations and on buying in ICT teaching time. • A disadvantage of using OSS is the feeling of being somewhat out on a limb, and there is always the problem of convincing incomers that OSS works. 									
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The head teacher feels that the ICT provision in the school is good and getting better all the time. It is reliable, and cost savings from OSS have enabled the school to put money towards buying in part-time specialist ICT teaching. <ul style="list-style-type: none"> • One disadvantage of OSS is that some curriculum software will only run on a Windows operating system. Also, it has been difficult to find support personnel with the relevant experience and knowledge of OSS systems. 									
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • One teaching assistant likes OSS, as it is reliable and pupils need to be made aware that products are available other than those from Microsoft. • The pupils do not seem to mind whether they have Word at home, or StarOffice. At school, they have never complained about which they use. However, some pupils have commented that Microsoft Word is faster than StarOffice and that the toolbar is easier to read on Word. <ul style="list-style-type: none"> • The school has offered parents the opportunity to attend IT sessions in which they work alongside children in a lesson. A CD-ROM with the OSS used in school is available to parents for a nominal fee. A number of parents now use OSS at home and have enrolled in evening classes. Parents often say that they now use StarOffice at home rather than Word. 									

Open Source Software in Schools

Case study 5

Type of school	<ul style="list-style-type: none"> • Medium-sized rural secondary school • 527 pupils aged 11–18 years • Large number of sixth form (19%) and special educational needs pupils (24%) 									
Open source use	<table> <tr> <td>Server</td> <td>100%</td> </tr> <tr> <td>Computer</td> <td>20%</td> </tr> <tr> <td>StarOffice</td> <td>100%</td> </tr> <tr> <td>OpenOffice</td> <td>10%</td> </tr> </table>		Server	100%	Computer	20%	StarOffice	100%	OpenOffice	10%
Server	100%									
Computer	20%									
StarOffice	100%									
OpenOffice	10%									
ICT in the school	<ul style="list-style-type: none"> • The ICT plans for the next three years are to place the now-developed ICT infrastructure fully at the service of teaching and learning. • Increasingly, ICT will be central to all teaching and learning and will help make lessons more engaging. • ICT will be increasingly used to communicate within and between schools as the technology develops and becomes more reliable. • The ICT manager is responsible for managing and supporting the infrastructure. He was the main driver for introducing OSS in 1999 due to the lack of funds available, and its reliability and security. <ul style="list-style-type: none"> • Furthermore, there was an underlying feeling that there is an ethical issue of whether a school should be contributing to the profits of large, rich corporations or encouraging the open, collegiate approach to software development espoused by the OSS community. • The LEA provides support for the administrative systems in the school, but offers no support for the OSS elements of the infrastructure. 									
Overview of hardware and software	<ul style="list-style-type: none"> • The school has a client–server network with all the servers built in-house running Linux (Mandrake). • The computers used by the pupils mostly run Windows. It is intended to convert these to dual-platform Windows 98/Linux systems. <ul style="list-style-type: none"> • The computers have a number of OSS applications installed including StarOffice, IrfanView, OCS Inventory, Virtual CD ROM, TUXpaint and Crocodile Clips along with Microsoft Office and SIMS. 									
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • The school has an efficient, reliable, easy-to-manage network – built from OSS – which extends to the primary schools in the cluster. The network would not be as easy to manage with Microsoft software. • OSS is much cheaper. Parents have been made aware how OSS is saving costs and that their <p>children are experiencing alternatives to Microsoft software.</p> <ul style="list-style-type: none"> • A disadvantage of OSS is that it was difficult or, indeed, impossible to link to administrative systems. • Initially a few parents were unhappy about the introduction of OSS, but there is no problem at all now. 									
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The head teacher believes that the ICT manager's maverick style and drive have been crucial to the school's success. The school has a well-developed system in place, and the SMT believes it now needs to maximise the system's potential for teaching and learning. • Financial savings on software expenditure impact indirectly on teaching and learning by enabling <p>spending on other things such as hardware and technical support.</p> <ul style="list-style-type: none"> • There are some compatibility issues, but the disadvantages of OSS are outweighed by the benefits. Initially the technician needed to spend a lot of time on building the system, and so was not sufficiently available for real-time general support. This is no longer a problem. 									
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • One teacher felt happy with StarOffice in general, and believes its use has no adverse impact on curriculum delivery or student attainment. The pupils are quite adaptable; they do not feel threatened by the unknown. • Another teacher is not a fan of StarOffice and prepares all his lessons in Microsoft Office. He is a big Microsoft PowerPoint user and finds that <p>presentations do not translate easily to StarOffice. In spite of the "inconvenience" of StarOffice, he feels it is probably worth it for the savings – in order to put more hardware into the school.</p> <ul style="list-style-type: none"> • The pupils seem to prefer StarOffice to Microsoft Office because they have been taught how to use it properly. One commented that StarOffice is very reliable and "breaks less often". 									

Case study 6

Type of school	<ul style="list-style-type: none"> • Medium-sized urban primary school • 197 pupils aged 4–11 years • The school was rated as very good in the latest Ofsted report 									
Open source use	<table border="0"> <tr> <td>Server</td> <td>0%</td> </tr> <tr> <td>Computer</td> <td>0%</td> </tr> <tr> <td>StarOffice</td> <td>75%</td> </tr> <tr> <td>OpenOffice</td> <td>2%</td> </tr> </table>		Server	0%	Computer	0%	StarOffice	75%	OpenOffice	2%
Server	0%									
Computer	0%									
StarOffice	75%									
OpenOffice	2%									
ICT in the school	<ul style="list-style-type: none"> • The ICT plans for the next three years include improving the ICT support and training for the teachers. They are hoping to improve the use of ICT and the quality of curriculum delivery using ICT. • The head teacher carries out the role of ICT co-ordinator and buys in technical support from the LEA. • The school's previous head teacher introduced OSS 18 months ago with StarOffice and Super 	<p>Duper Music Looper. The main driver was believed to be the high cost of Microsoft licences.</p> <ul style="list-style-type: none"> • The LEA originally supported the idea of using software other than Microsoft (ie OSS options) in the school. The school tried a couple of options before alighting on StarOffice as the best one. 								
Overview of hardware and software	<ul style="list-style-type: none"> • The school has a peer-to-peer network linking the two administrative machines, and an extended peer-to-peer network for its ICT suite. • Each class has a PC connected to the internet, to the PC suite and to the colour laser printer. • The computers have a range of Windows operating systems from Windows 95 to XP. 	<ul style="list-style-type: none"> • StarOffice is loaded on approximately 75% of the computers, and has been available for 18 months. • The only other piece of OSS is Super Duper Music Looper, which is on about 30% of computers. • Microsoft Office is also available on 30% of the computers that have StarOffice on them. • Nearly every teacher has a laptop with StarOffice and Microsoft Word installed. 								
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • The school was not prepared to pay for Microsoft Office. • StarOffice originally cost about £20, with £5 to upgrade to V7 – but the school can now produce pdf files. • The head teacher advises that StarOffice is more straightforward for a learner, and this is backed up by feedback from the pupils. 	<ul style="list-style-type: none"> • One disadvantage of using StarOffice is lack of familiarity. While StarOffice is easier to use, teachers and pupils are more familiar with Microsoft Word, and therefore want to stick with it. 								
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The head teacher advises that the provision of ICT, including OSS, in the school has improved markedly since five years ago, when children were 	<p>only able to use computers during their free time. Now, the children have access to reasonably good ICT facilities.</p>								
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • The teachers interviewed advised that the pupils were confident using StarOffice and seemed to think that it is much easier to use than Microsoft Office. Compared to other software, there seemed to be fewer problems. No disadvantages have become apparent. 	<ul style="list-style-type: none"> • Training was not officially given for OSS, but was carried out through mentoring and observing others. • The pupils reported that they tend to use StarOffice as it is easier to use, but they also like Microsoft Office because of its functionality. 								

Open Source Software in Schools

Case study 7

Type of school	<ul style="list-style-type: none"> • Large urban secondary school • 1466 pupils aged 11–18 years • Ofsted considers it an excellent school 									
Open source use	<table> <tr> <td>Server</td> <td>70%</td> </tr> <tr> <td>Computer</td> <td>0%</td> </tr> <tr> <td>StarOffice</td> <td>0%</td> </tr> <tr> <td>OpenOffice</td> <td>100%</td> </tr> </table>		Server	70%	Computer	0%	StarOffice	0%	OpenOffice	100%
Server	70%									
Computer	0%									
StarOffice	0%									
OpenOffice	100%									
ICT in the school	<ul style="list-style-type: none"> • The vision is to have “anytime, anywhere” learning. A virtual learning project has already started, with the school hoping to put course materials together on a Virtual Learning Environment (VLE) in conjunction with the North West Learning Grid. • The ICT facilities in school are exceptional, with a brand-new e-learning centre, which opened in September 2002. • The expertise of staff in ICT is very good, with a continuous programme of training provided through the New Opportunities Fund. • Following unproductive trials of a Windows 2000 Server, the school is migrating the administrative network to Linux, running Samba. <ul style="list-style-type: none"> • The school is also looking to move the curriculum network over to Linux. • All the Linux internet servers are being updated and their existing RedHat distribution is being replaced with Slackware. • Decisions about ICT development are made through SMT meetings, which include the head of ICT. The network manager carries out the day-to-day ICT management. • OSS was introduced by the network manager because of its transparency and adaptability. 									
Overview of hardware and software	<ul style="list-style-type: none"> • The school uses Novell Netware and Linux file servers, and has eight ICT suites. • Apache on Linux has been used since 1997, and has been found to be at least as secure as other alternatives, and considerably more stable. • All computers have an internet connection through an internal Squid proxy server, which carries out web filtering using squidGuard. <ul style="list-style-type: none"> • The network is protected from the outside by a hardware firewall on the school’s main router, and a second firewall on an internal Linux router. • Less than 1% of the school’s computers run Linux. Pupil’s laptops have Windows 98 on them. All the staff laptops have Windows XP. Microsoft Office is used 90–95% of the time. 									
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • Linux for the curriculum network provides flexibility, multi-platform interoperability, better support for older hardware and freedom from expensive corporate lock-ins. • Linux is also very secure and more stable than a rival server operating system the school tested. • The use of any version of Microsoft Outlook or Outlook Express is strictly forbidden on the network, because of concerns over security and virus infections. <ul style="list-style-type: none"> • The network manager feels that the transparency of OSS is more important than the cost saving, because he is able to adapt it to meet the school’s needs. • The head of ICT advises that the lack of compatibility with pupils’ home software causes problems. Pupils bring in work that they cannot read – particularly Word or Excel documents. 									
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The head of ICT advises that the whole school worries about cost, but the introduction of OSS has had a significant impact. The SMT is now much more comfortable with value for money than it was in the past. <ul style="list-style-type: none"> • The SMT’s perception is that overall ICT provision is costly, but that it is quite good value. 									
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • Even though OpenOffice is available on the desktop and laptop computers, most teachers and pupils are unaware of OSS, because they mainly used Microsoft products. 									

Case study 8

Type of school	<ul style="list-style-type: none"> • Small mixed secondary school • 669 pupils aged 11–16 years • Exam results significantly above both county and national averages 									
Open source use	<table> <tr> <td>Server</td> <td>60%</td> </tr> <tr> <td>Computer</td> <td>33%</td> </tr> <tr> <td>StarOffice</td> <td>0%</td> </tr> <tr> <td>OpenOffice</td> <td>100%</td> </tr> </table>		Server	60%	Computer	33%	StarOffice	0%	OpenOffice	100%
Server	60%									
Computer	33%									
StarOffice	0%									
OpenOffice	100%									
ICT in the school	<ul style="list-style-type: none"> • The school's short-term plans are to facilitate a major dual-platform system throughout the school. • The long-term plans are to move towards mainly Linux and OSS. • The school is looking for OSS alternatives for all the current subject-specific software being used. • The school has an ICT co-ordinator/manager and a technician responsible for day-to-day ICT management and support. <ul style="list-style-type: none"> • OSS was introduced for its educational value, to provide pupils with a wider view of operating systems and software. • When setting up the first OSS network, the school was able to reuse old computers. 									
Overview of hardware and software	<ul style="list-style-type: none"> • The school has a client-server network with a mixture of Windows 2000, NT4 and Linux Mandrake servers. • It has a mixture of computer operating systems including Windows XP, NT and 98, Macintosh and Linux. • The Linux computers are dual platform with the Windows operating systems. <ul style="list-style-type: none"> • OSS includes OpenOffice, Mozilla, Konquer (default browser), GIMP, Pro Desktop, Calc, Audacity, Rosegarden. • Other software includes Microsoft Office, SIMS, Pro Desktop, 2D Design, Heineman language software, Pinpoint, Keybytes, Cudos and Streets Ahead. 									
Advantages and disadvantages of using open source software	<ul style="list-style-type: none"> • The school thinks that OSS was more reliable and secure than other operating systems. • The biggest advantage is cost saving. The school recently spent £13,000 on installing the latest ICT suite, including all OSS and Microsoft licences. A full Microsoft-equivalent set-up would have cost £44,000. <ul style="list-style-type: none"> • Remote management of the OSS network assists with the general network management. • Disadvantages are having to buy Microsoft licences for dual-platform systems, and teaching people how to use the new OSS and system. 									
Perceptions of senior management on the use of open source software	<ul style="list-style-type: none"> • The curriculum ICT facilities are good and getting better all the time. • Cost is the main advantage of using OSS, saving approximately one-third of the money that would normally be spent when equipping a computer suite. • The different platforms help to broaden the pupils' minds and skills and provide a wider knowledge of hardware and software. <ul style="list-style-type: none"> • Pupils need training on all the platforms, so that they get used to them quickly. • There is a risk that if the ICT manager leaves, the school would have a serious problem due to lack of other OSS expertise. 									
Perceptions of teachers and pupils on the use of open source software	<ul style="list-style-type: none"> • Teachers like the fact that OSS enables students to think about alternative software. They also like the fact that it is free and updateable, and it has good manipulation facilities. • OSS is very easy to learn, and students generally pick it up quite quickly. <ul style="list-style-type: none"> • Using OSS can make it slower to complete lessons because pupils are less familiar with the terminology that is used. • Pupils advise that when they first used OSS it was quite hard, but now they are used to it, they find it easier to use than Windows-based programs. 									

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