



Evaluation of the DfES ICT Test Bed project

A case study of the learning platform(s) in one cluster

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The development of the learning platform in one of the ICT Test Bed clusters has been trailblazing, which has meant that there have been many challenges and new decisions to be made at every stage, each of which has impeded progress. Furthermore, it is not simply a matter of identifying technical solutions but also a matter of major cultural change. This requires a significant focus on change management but can also take longer to achieve in larger educational institutions. Therefore, it is not surprising that the learning platform is still at a relatively early stage of development at the end of the ICT Test Bed funded period and the significant achievements to date and the resulting wider impact across the LA should be recognised and celebrated. The use of the learning platform at secondary school in this study is more advanced than in many secondary schools in the UK due to the hard work and commitment of staff and senior managers, yet it is still not fully embedded which is hardly surprising given the enormity of the task. The lessons learned so far will be hugely valuable in view of the subsequent policy developments; this has been a genuine 'test bed' initiative, laying a trail for others to follow. This study represents a snapshot in time of the implementation and development of a learning platform in the cluster of schools.

It should be noted that there are many alternatives to providing some of the functionality of a learning platform and, before taking the decision to purchase one, schools – particularly primary schools – should give careful consideration to what is in place already within their institution and what requirements, if any, still need to be met.

Key findings

What was the vision behind the learning platform established in one cluster and to what extent has the vision been realised?

- The vision for the schools involved included:
 - maximising the affect of the home provision of computers and connectivity in ICT Test Bed
 - promoting e-learning, engagement and personalised learning
 - increasing family engagement and reaching the 'hard to reach'
 - reducing teacher workload, improving efficiency and sharing resources.
- Those schools that have embraced the use of learning platforms to support teaching, learning and management have made significant progress in many aspects such as day-to-day school management, homework management, communication and parental involvement. Whilst there is evidence that some aspects (e-mail, school diaries, bulletin boards) have become embedded in some schools it is still in early stages of infancy particularly in relation to use in primary schools and use by parents.
- Where the learning platform is beginning to be embedded, changes are being driven by enthusiastic staff with strong and effective leadership.
- In this study access to pupils was limited and there was no access to parents. Therefore it is difficult to draw any conclusions relating to

home uses. However, staff reported that homework submission had improved at the secondary school, and usage statistics suggest an increase in activity by parents when access to attendance data was enabled.

- The provision of a content development team ensured that a strong support structure was in place (including a comprehensive programme of training events from beginner to advanced). The central control from the secondary school meant that individual primary schools had less control in relation to the administration of the system.
- There were some concerns that linking school and home through ICT would lead to some families having less need to visit primary schools, thus reducing personal contact. However the schemes that were established to train families in ICT skills and the learning platform served to strengthen existing home-school links.
- The LA has supported the adoption of the learning platform and all secondary schools in the authority have taken it on, and some pilot primary schools have been supported in developing usage prior to offering access to all primaries. In addition, the content development teams have developed learning platforms (including a range of content) for schools outside the authority and outside the UK. This is a significant achievement and an indicator of success.

How are teachers using the learning platform in relation to homework and in other ways and how effective has this been to date?

- Teachers in these ICT rich schools (and communities) were confident that pupils had some form of access to ICT outside the classroom. For example, the LA supported the development of a number of learning centres where ICT access was available prior to ICT Test Bed. They thus set homework reliant upon technology use rather than being inhibited by digital divide concerns.
- Most staff (including support and admin) used the learning platform at least for email and for storage of and access to some documentation and resources. Benefits included:
 - sharing ideas
 - better communication
 - more flexibility in working practices
 - access to up-to-date information
 - making processes more efficient, thus saving time
 - being able to prepare work for supply staff more easily.
- There was some staff resistance at primary level to promoting pupil use other than email largely due to lack of confidence or lack of time, but also because such changes had not been 'required' through school policy decisions.
- There was some evidence of exemplary use at both primary and secondary level by hard working enthusiasts who could see the potential benefits of a learning platform. Some of these staff have been instrumental in working with the LA and headteacher Partnerships in engaging other schools in the cross-authority learning platform development.

How are pupils using the learning platform?

- Pupils at the secondary school were using email regularly according to some staff. Those in Key Stage 3 and particularly in Year 7 were undertaking some homework online. Staff reported that the amount of homework submitted had increased and that the online system alleviated the burden of chasing outstanding work. Some pupils were accessing content and resources such as schemes of work but this form of use had not yet been a focus.
- Pupil use at two of the three primary schools visited by the evaluators was limited to classes led by teachers who were enthusiastic about the potential of the learning platform. These pupils were accessing homework online (either through the curriculum management system or the class homepage) as well as emailing. In the third primary school, pupils used email and accessed commercially created content (without record keeping facilities) at school and at home, generally out of choice rather than being directed to do so. However, use other than email was limited according to pupils interviewed, particularly after the novelty effect had worn off.

How are schools using the learning platform to communicate with parents and what is the impact of this? How are families using the learning platform?

- Parental access, particularly in primary schools, was very limited but this feature had only recently been enabled and only partially in primary schools.
- The learning platform was being used to provide general information for parents such as newsletters and school uniform, together with access to resources to support continuing education.
- Access to attendance, achievement and behaviour data was enabled in the secondary school and had increased parental usage (as measured by page hit statistics relating to the learning platform).
- Where parents engaged fully with everything that was offered such as opportunities for training staff perceived that there had been a positive impact, for example on ICT skills and awareness of how to support children's learning.

Messages for other schools considering implementing a learning platform

- Get users involved as soon as possible to identify what is needed (teachers, pupils, parents and governors). Sites for each the groups need to be relevant and purposeful.
- Consider the functionality within a commercial learning platform in relation to what already exists within the school. What functionality is required in relation to communication and collaboration,

document and content management, MIS systems, home access, record keeping, administration and security¹?

- Ensure that staff are involved in developing processes and systems; there needs to be a sense of ownership for full and active participation.
- Visit other schools that have a commercial learning platform or alternatives in place. If training opportunities are limited this is a beneficial activity.
- Undertake training where possible. This will provide an overview of how to develop the learning platform together with more specific advice, hints and tips.
- Identifying staff to lead by example can be beneficial and accelerate the processes of development and embedding, but there needs to be strong support from senior leadership. That is, change management should include bottom-up and top-down drivers.
- The change management tools, developed by the National Remodelling Team in 2003 to support workforce reform agenda and now incorporated within the Training and Development Agency for Schools (TDA), are very helpful when implementing a learning platform [see <http://www.tda.gov.uk/remodelling/managingchange/tools.aspx>].
- Presenting the rationale and strategic reasoning for introducing the learning platform to staff could minimise resistance to change.
- Introducing the learning platform features in stages can ensure that all staff have positive experiences. Changing to the learning platform email system at the outset encourages regular use and develops familiarity.
- Formalisation of process changes through policy decisions (eg in relation to email use and planning) can be helpful.
- As with any change management process, staff need time to familiarise themselves with new tools and techniques, and to develop resources. Some staff will undertake this of their own accord as a result of personal interest. Others may need incentives such as funding, release time or mandatory staff training.
- Shifting document storage to the learning platform enables access from anywhere and reduces the need to print. Thought needs to be given to organisation and access of such materials.
- To maximise efficiency, introduce a cultural change from sending out information (via whole school email) to requiring staff to search for information (visiting bulletin boards regularly).

¹ A helpful starting point is the Becta matrix for learning platform functionality:
http://matrix.ncsl.org.uk/GMATRIX_679799_80991066/1165941961863/rebrand/matrix/index.cfm?matrix=136&forcenew=yes

- In relation to day-to-day management of the learning platform there needs to be a clear delineation of roles and responsibilities. Sites within the platform need to be checked and updated regularly.
- There is strength in numbers; implementing a learning platform as a cluster of schools (here school-led but it could equally have been LA-led) can offer mutual support and encouragement, the sharing of good practices and ideas, and access to a wider range of content and resources. Others (eg Russell et al., 2005; Twining et al., 2006, p27) also highlight the benefits of this approach.
- To promote family engagement with a learning platform, one-to-one training is beneficial and maintaining personal contact through appointed staff or parent representatives can also help.
- Think creatively about 'quick wins' and hooks to encourage use by all stakeholders.
- Shifting from traditional homework practices to online homework combined with a rewards system can be motivating, increase homework submissions and may reduce workload. However, issues of quality and potential over-mechanisation need to be addressed.
- Engaging staff to design content can ensure that resources meet individual needs, but even with financial reward (which of course has funding implications) it can be challenging for teachers to find the time to engage in this process.

Introduction

At the start of the ICT Test Bed project, the cluster of schools in this LA had already secured substantial funding to create a community learning network, linking together a secondary school, seven local primary schools, community centres and libraries through broadband technologies (ICT Test Bed plan, secondary school, 2002). In addition the 2002 Ofsted inspection at the secondary school raised some concern about homework provision within the school. In response to this the leadership group at the secondary school stated in its ICT Test Bed plan that standards in teaching and learning would be raised through the 'introduction of a 'portal', within which a homework facility will be embedded. Homework facilities will be operating by summer 2003.' [p.23] This aim was developed jointly with the seven primary schools in the cluster, and complemented the interests of the LA which already had two pilot projects that had been in place for some time and were exploring the potential of learning platforms.

The main purpose of this study was to explore the impact of the learning platform in this ICT Test Bed cluster on homework practices, and linking school and home. In order to comply with the evaluation team ethical guidelines and so that no endorsement is given to a particular product, the schools, staff and learning platforms have been anonymised.

The key research questions were:

- what was the vision behind the learning platform and to what extent has the vision been realised?
- how are teachers using the learning platform in relation to homework and how effective has this been to date?
- how are schools using the learning platform to communicate with parents and what is the impact of this?
- what other content is being provided and how is the learning platform being used to support teaching and learning more generally?
- how are pupils using the learning platform?
- how are parents/guardians using the learning platform?

The data were collected from interviews (including demonstrations) in the secondary school and two primaries, with individuals recommended by the schools rather than with a representative sample of staff. This may have had the effect of focusing attention on successful elements of the development, but given the relatively early stage of roll out of the learning platform this is likely to have provided more information to guide the work of others. The interviews were held between March 2006 and July 2006:

- Interview with a senior manager in the LA
- Interviews with members of the content development team, based at the secondary school
- Interviews with teaching staff, senior leadership and pupils at the secondary school
- Interviews with school bursar, senior leadership and pupils at primary school A
- Interviews with senior leadership and teachers at primary school B
- Attendance at conference on cluster learning platform July 07
- Incidental interview data from previous studies (including data from primary school C)

It should be noted that for reasons outlined below one of the primary schools (primary school A) trialled a learning platform from a different provider to the rest of the schools in the cluster but also implemented the learning platform chosen by the cluster as well. This provides an interesting contrast and there are additional lessons to be learned from the choices made by this individual school.

Learning platforms and government policy

As part of the government educational reforms (DfES, 2005a) and the personalised learning agenda (DfES, 2004), all schools should have a learning platform by 2008:

“By 2008 all schools will be able to offer access to e-learning resources both in and out of school. We will encourage all schools, by this date, to make available a personal online space available to every pupil.” (DfES, 2005a, p.60)

This should promote innovative use such as online homework and marking, and link school and home. Pupils will have a safe and secure personal online space for accessing e-learning resources, storing work, recording achievements, and communicate and collaborate with peers (DfES, 2005b). In some cases parents may have online access to information about their child and the school, which will be further enhanced if the learning platform is integrated with the MIS providing parental access to attendance, behaviour and attainment data (DfES, 2005b).

The intention is that learning platforms will underpin other government initiatives such as the workforce reform agenda (DfES, 2005b). Indeed, it is argued that the learning platform should enable teachers to work more efficiently, tailor resources to meet individual needs and learning styles, and track pupil progress as well as communicate with their peers both in and out of school, and share resources. The use of learning platforms should also support cross-institutional collaboration, e-portfolios, pupil inclusion and preparing pupils for working life.

The two learning platforms

The learning platform which was implemented across the whole cluster will be referred to throughout this report as learning platform A.

The functionality included:

- communication tools including public/open email, messaging (although not enabled at the time of the study), bulletin boards, discussion forums
- a curriculum management system enabling teachers to create activities, import activities, assign them to individual pupils or whole classes using scheduling if required, offering auto-marking facilities with override options, and recording individual pupil achievements with additional tools to manage this such as highlighting underperformance
- provision for organising additional learning resources and other documentation such as planning
- the ability to access the learning platform from outside the school via the web
- areas designed for staff (including access to shared school diary and noticeboards), pupils and parents
- survey tools including online questionnaires
- integration with MIS offering electronic registration and access to student data on attendance, behaviour and achievement, together with optional modules for pupil report writing

- parental access to the MIS so that they can track their child's progress and check on attendance
- security and controlled access so that each user can only see information that is relevant to him/herself whether staff, pupil or parent.

The functionality of learning platform B was more limited but included:

- communication tools including private/closed email, bulletin boards, discussion forums
- provision for organising learning resources and other documentation such as planning
- the ability to access the learning platform from outside the school via the web
- areas designed for staff, pupils and parents; pupil personal pages had not been enabled.

Security and controlled access so that each user can only see information that is relevant to him/herself whether staff, pupil or parent.

The local authority vision

The educational vision for the whole authority had at its foundation the requirement to embed ICT into educational services. “[The] effective use of ICT is of paramount importance in the [LA] vision, to improve communications, to deliver curriculum materials and to act as a vehicle for the exchange of ideas and the democratisation of learning” (LA, 2005, p20). As a central part of the vision, it was intended that a common learning platform would eventually be rolled out to all schools and other educational services. Through a range of initiatives including building schools for the future the intention was to transform teaching and learning, drawing on the personalised learning agenda (DfES, 2004). The aim was to develop a learning platform that would provide (p.55):

- collaborative learning spaces
- conferencing (including video)
- secure personal email for staff and students
- local (secure) instant messaging for staff and students
- personalised learning spaces accessible from home or school
- on-line and off-line assessment
- e-Portfolios – accessible to students, teachers and parents/carers
- content and resources (locally created and commercial packages)
- integration with MIS systems.

The vision of the LA was that the learning platform would increase flexibility and support personalised learning through offering greater choice as to when and where learning could take place, offering greater learner autonomy. It was believed that the use of learning platforms to facilitate greater levels of communication would have wide ranging impact from teachers communicating electronically with students, to greater parental and community involvement, and better communication between agencies. This in

turn should contribute to raising standards and aspirations (particularly important in an area of social deprivation such as this), transforming teaching and learning, providing greater access to rich resources, and upskilling the workforce. Furthermore, the learning platform should enable teaching to be transformed, greatly increasing opportunities to share ideas and resources both within a single school and between schools: "Primary schools and secondary schools will be able to share experiences and ideas through improved connectivity and through a programme to support the required change management" (LA, 2005, p.23).

The vision(s) of the schools

The vision of the schools was spearheaded by the headteacher at the secondary school but certainly shared by many of the key stakeholders (senior staff from both the secondary and primary schools) in the development of the learning platform. However, it seems that understanding the full potential was challenging for some individuals. This is hardly surprising when at the time there were few concrete examples of learning platforms in school environments.

The underlying rationale was to maximise the impact of the provision of computers in the homes and promote e-learning and engagement. The original vision was that the learning platform would be an indispensable one-stop shop for all stakeholders, broadening opportunities and in particular facilitating personalised learning (DfES, 2004) for pupils. A further element was to increase family engagement and access hard to reach communities. Finally, the potential for improving efficiency and sharing resources was also recognised at the outset: "I think also coming into it, was trying to reduce teacher workload. [...] Working smarter, faster, the whole concept of the teacher training to be a learning manager." [content development team]

Learning platform A (functionality described above) was launched in September 2004 and the curriculum management system was fully enabled in May 2005. In the summer of 2006, the perception was that the vision would be fully realised within a year, having already developed a system that was *'70 per cent there'* [content development team].

The extent to which the vision has been realised

Staff perceived that there were varying degrees of engagement with the learning platform across all ICT Test Bed schools (and indeed within schools). Five of the seven primary schools were using the learning platform for the school diary, and document storage including planning. In some cases, individual teachers were storing all documents within the platform rather than within the school intranet as this facilitated home access. All school staff and all pupils had been given email addresses. Parental access to the learning platform (family portal and skills for life training services) had been made available and offered (via a letter and invitation to attend training) in at least two of the primary schools and at the secondary school. The secondary

school had also just enabled access to additional data relating to attendance, targets and achievement, the timetable, merits and behaviour (via the integrated MIS system). This facility was due to be introduced in primary schools in September 2006.

Development to date

The development of the learning platform was driven through strong leadership (a well-acknowledged factor in successful ICT innovations, see for example Scrimshaw, 2004) within a school-managed approach rather than an LA managed approach. The secondary school had a service level agreement with the LA to provide the learning platform and content. This has meant that the LA had less control than in previous authority experiences of ICT innovation. This was part of the overall LA policy of supporting school-led improvement initiatives and capacity development.

The procurement process was initiated and overseen by a member of the content development team, the implementation manager, with support from Becta and the LA. The cluster had specific requirements from the outset such as being able to link to the MIS that had already been implemented and facilitating right to left scripting for use in some of the students' home languages. The procurement process was problematic as the suppliers competing for the award of the contract, who were sourced from the Becta website, were not able to provide examples of learning platforms in use in primary schools or even demonstrate the features that the schools desired. The suppliers attended a meeting of representatives from all the ICT Test Bed schools and gave presentations which were described to be 'very technical'. The implementation manager, who had a great deal of ICT expertise, was unable to attend the meeting at which the decision was made for reasons beyond his control. He commented that the original decision may have been different if he had been on hand to offer assurances and guidance. This could have been the case but a senior officer at the LA noted that all the presentations were 'visionary'. Some members of the cluster rightly felt that seeing tangible evidence of a product was important and this affected the decision making process: *"They weren't prepared to go ahead without seeing what had been offered [actually in use in schools]"* (senior officer, LA). The cluster as a group (cautiously) selected one provider initially with the proviso that visits to schools using the learning platform could be arranged. However, this opportunity did not materialise for a variety of reasons. After six months, causing an obvious delay in the process, the cluster switched to another provider (the preferred choice of the implementation manager and the headteacher at the secondary school). The solution the cluster finally opted for was based on a set of products in their early stages of infancy and at the time had only been implemented in one other secondary school and no primary schools. However, the supplier was able to demonstrate the products to the group:

The procurement of the learning platform was a difficult process, as a lot of the solutions were not fully developed. The one we opted for was [learning platform A] which when demonstrated showed a working solution that was solid with familiar features, it was a firm basis to start from. [Senior officer, LA]

Those responsible for implementing the learning platform did what they could to learn how best to proceed. Visits were undertaken to the one school in the UK at that time that had already implemented the same learning platform and several schools that had implemented the curriculum management system (which operates independently). Staff also worked closely with an infrastructure services business. Thus they were able to get some idea of how the system could best be set up. Tearle (2004) for example argues that infrastructure for technical support is a key factor in successful ICT implementations in schools.

The chosen solution was implemented in September 2004. This included an environment which supported communication and resource management, together with the curriculum management system which was implemented in May 2005. Teachers were asked to provide designs for suitable activities through a 'storyboarding' process. Tearle (2004) noted that when teachers are able to see the relevance and purpose of ICT use, as should be the case when they are involved in the development of digital teaching resources, there is likely to be a greater effect on take-up of ICT in teaching practices. The process was refined and became more formalised, more detailed, more iterative and with greater user involvement.

Well we work really closely with the teachers from the story boarding to the end result. We often give advice with the storyboarding to begin with so we'll try and tell people what we can do, what they can expect from us, the kinds of things they can ask us to do. [...] In the early days, because people were finding their feet as we were ourselves, we'd often have to go through it again with people and say can you give us a bit more detail here. [Content development team]

The benefit of taking on a learning platform in development has been the opportunity to work closely with the supplier and help to influence the functional developments, thus ensuring that implementation has been driven by needs rather than available functionality. This has been rewarding for the staff involved.

Email and communication tools

The LA web-based email system was replaced with email facilities offered through the learning platform. The strategic intention was that this would be a quick win as teachers were already largely using email and this would help to familiarise staff with the features of the learning gateway. This approach has been successful in other schools (Harris, 2006). In addition, students were provided with their own email address. Staff noted that there had been a steady increase in email traffic.

In the primary schools, teachers noted that there was some limited email exchange between staff and students. This was primarily in relation to student concerns or seeking homework help, and was seen to be beneficial. At the time of the study the number of emails (for example, in one school said to be around three per week) was seen to be manageable. Pupils at one primary school said that they used email every few weeks or so to email friends for fun. One pupil said that he emailed his friends when he had forgotten to note what the homework was. Pupil email use, whilst raising some issues and concerns such as child protection, was largely seen as beneficial:

One of the things that having that facility has done, is that it has increased the self-confidence and the self-esteem of some of the children. It has allowed them to communicate in a way that they didn't have before, and they weren't able to go up and talk to somebody but they could email which is one step removed. [Content development team]

Pupils in one primary school were using email in a buddying system which staff perceived was beneficial. Harris and Kington (2002) describe a case study that used email in a similar way, 'e-pals', that was believed to have developed personal attributes.

Email was used in the secondary school between staff and pupils for sending and receiving work, and asking questions. For example, in IT pupils emailed their work to the teacher during weekends and holidays. Again the workload was seen to be manageable. Pupils also emailed each other their work for self-assessment and when working in teams, and asked each other for advice about homework.

There are a number of issues relating to email use that schools have had to deal with. These are discussed below under both 'achievements and factors for success' and 'challenges'.

Staff at both primary schools in the study noted that the school diary, notices and staff meeting minutes were held in the learning platform. This meant that staff could easily access the information from home or school. The information (such as last minute staff changes) was delivered to all teachers' desktops rather than relying on them to find out the information by for example going into the staffroom to look on the whiteboard. At primary school B the communication system had been embedded within the learning platform.

"When I first came we had a daily briefing session, so of course we don't have to do that anymore because staff were saying we don't need [it]. They just come in, put their [interactive whiteboards] on, get [the learning platform] up and check their diary. So we just have a beginning and end of week briefing now so people are actually in the classrooms setting up, which is where they should be really, isn't it." [Senior manager]

Staff were very positive about this cultural shift and it had become the norm such that they referred to the learning platform in many conversations in relation to communication and documentation.

Technical fault reporting had already been implemented online at one of the two primary schools in the study using the survey tools in the learning platform. This has ensured that the way in which faults are handled is more efficient as well as providing documentary evidence of the technician's workload. Tasks were then assigned to relevant members of staff (the IT co-ordinator, admin staff, the technician) by the technician. At the other primary school a similar system had been implemented on the intranet and it was planned to move this into the learning platform. Similarly the survey tools in the learning platform had been used to track equipment, a problem which arose because staff did not always complete the required paperwork. The form required staff to provide their name, identify the equipment and when it would be returned. This made the management of equipment much easier. The survey tools had also been used to provide a log of videoconferencing. By locating these processes within the learning platform staff had more reason to access it and use it, again developing familiarity with the package.

One primary school had trialled a discussion forum with staff, but there had been no responses. This option had not yet been developed for use with students although staff were beginning to think about the application of this communication tool. The online survey tools were being used to differing levels of success with staff (see examples above), parents and pupils.

The 'homework system' at the secondary school

The concept of 'homework' was radically changed, shifting from a traditional paper-based practice to one which was online, automated and accessible anywhere and anytime. An online homework system based on the curriculum management system was still under development in the summer of 2006 with an initial focus on core subjects in Key Stage 3. A reward scheme was in place and achievements of students who had completed all required homework were celebrated. The curriculum management system enabled staff to create basic activities (without animations) using a wizard and templates. Teachers were also designing interactive resources which the content development team then developed using tools such as flash and which were then imported into the learning platform. For example in textiles, an activity had been developed whereby students dragged and dropped an image associated with a type of fabric onto an image associated with its origin. Resources could also be created using standard software packages and integrated within the learning platform.

The curriculum management system enabled pupils to access their homework anywhere. At the time of the study paper systems were available for those without Internet access at home or students could attend a homework club or access the technology in school at other times. However, it is notable that on the whole it was assumed that pupils had some form of access, whether at

home, in school or through provision in various community centres across the area. It was perceived by both teachers and pupils to be easy to access.

Teachers could administer the homework through the software. On entry they could clearly see the 'assignment inbox' identifying new submissions from students. For example one teacher doing a demonstration had set some homework the previous evening and he could see that two students had already completed it. This facility enabled teachers to easily identify outstanding work. The teacher could set an assignment for a whole class or individual student, and set the due date and time. The assignment could be distributed immediately or at a set time, enabling staff to ensure that keen students did not access assignments prematurely whilst facilitating planning and allowing students to see what topics would be covered. Assignments could be identified as mandatory or optional, offering opportunities for extension activities. In addition, the 'assignment' could be undertaken by the whole class simultaneously in an ICT suite for example as a test.

Once submitted, assignments could not be changed and could be auto-marked if the teacher chose, providing immediate feedback for students. Alternatively assignments could be sent to the teacher for marking (depending on parameters set by the teacher). Even when auto-marked a teacher could choose to manually adjust the score for example by giving credit for 'working out'. The teacher could grade the work and provide a comment for the individual concerned.

The automated system provided the teacher with electronic records of all work set and the marks achieved by all individuals. Students achieving lower marks were highlighted on the screen enabling the teacher to readily identify those who needed more help. This type of method for record-keeping for assessment scores has been found to be highly effective (Harris & Kington, 2002). Teachers could access the work giving them most concern simply by clicking on a link. The overview of all students' marks could be exported to a spreadsheet easily if preferred. At parents' evenings teachers could show parents completed homework and feedback.

The use of the curriculum management system in primary schools

In the primary schools involved in the study, the learning platform had not yet been used in relation to homework at primary school A. Teachers made pupils aware of the content provided in the chosen alternative learning platform, learning platform B, but no formal homework was set relating to its use. The curriculum management system had been used in two other primary schools but only by the 'learning champions' in Key Stage 2 and not extensively, although it was still early days. At primary school C homework was set online on a regular basis, with the teacher printing off the activities for the small number of pupils in her class who did not have home internet access. For example, for science homework pupils were presented with an image of a flower and answered multiple choice questions on male and female parts. This was automarked so that the pupils obtained feedback immediately. Pupils were also able to comment in the self-evaluation box, identifying topics

that they found easy, challenging and hard using a simple traffic light system. This enabled the teacher to identify topics that needed revisiting prior to the SATs.

Other ways in which pupils are using the learning platform

In primary school B, the content management system had been used to create a class home page for a Year 6 class, extending the use of the learning platform from school management to classroom management. This feature has not been developed in the secondary school. It was not perceived to be relevant because each subject specialist teaches a number of different classes and year groups, although it could be used in a similar way to organise lesson materials. The page was set up with links to resources relating to literacy, numeracy, science and languages. Other information included 'star of the week', weekly spelling lists, links to surveys (for example on pupil perceptions of SATs preparation), and a section of news (for example SATs week, trips, competition deadlines). The teacher used to send homework via email but at the time of the study had changed her practice, providing the information on current homework on the class homepage with links to relevant resources. Pupils had also uploaded their classwork and used the survey tools to create quizzes. At this school, staff could attend a drop-in session and make use of a template, enabling them to customise their own class homepage and hence ensuring ownership (recognised as an important factor in successful ICT implementations, eg Tearle, 2003). However, attendance at 'optional inset' events was low and take-up was slow perhaps due to a lack of confidence (a commonly identified barrier to ICT uptake, see for example John & Baggott la Velle, 2004; Sutherland et al., 2004) or a perception that it was another job to undertake rather than being of benefit. That is, these teachers had not yet seen the value of using ICT, another barrier to uptake (Mumtaz, 2000; Tearle, 2004).

Additional features of the learning platform included uploading private and shared documents enabling students to easily transfer work between school and home, and accessing documents such as lesson resources, past papers and other content providing a digital cabinet of activities. These resources potentially offered a form of personalised learning (DfES, 2004) as pupils could undertake each activity at their own pace, in a chosen order, and any number of times ie follow a personal learning pathway. However, this was not facilitated within the curriculum management system and hence progress and assessment were not recorded. The students' portal also acted as a school planner with facilities for recording the timetable. One Year 7 pupil said that she liked being able to see the canteen page and what was being offered for lunch each day.

A few of the Year 11 pupils in an observed IT class described how they were already using the learning platform. Use was not widespread which was hardly surprising as this year group had not been targeted to date. The individuals who were already using it described the benefits as being easy to access from anywhere, being able to safely store work, accessing past papers

and subject resources. One pupil noted that the maths site was particularly well developed.

Pupils at primary school A said that the alternative learning platform (learning platform B described below) was easy to access from home and that they accessed the commercially created content for fun but not on a regular basis. Pupils noted that they had used the resources more initially when it was perhaps a novelty to do so. They also noted that they had used the content sometimes during lessons, for example in science, and also at the homework club. Although this learning platform had provided access to useful websites, the pupils said that once they were aware of them (sites for SATs revision for example) they tended to go directly to them as it was faster. The pupils' perception of this facility contrasted with that of staff who believed that this was one of the benefits of the learning platform. Pupils also noted that they had been asked to undertake research on the internet for homework but not asked to use the learning platform specifically in relation to their work.

Ways in which parents are using the learning platform

The local learning partnership, part-funded by ICT Test Bed but originating prior to the project, managed the distribution of over 1600 computers to families' homes, connecting almost half to internet services (filtered and monitored as in the schools). This was undertaken to meet the cluster objectives to support home-community links, reported elsewhere. One of the aims of the partnership was to introduce parents to the learning platform and provide them with access to information about their child's homework, progress, attendance and behaviour.

Parents had access to a family portal which was specific to each school. It was available for each of the primary schools but had not been developed by some, and access had not been provided in all schools. The family portal could include general news, school newsletters and other school information, information about individual children, and an easy means of communicating with the school. The facility to present information graphically or via video clips was perceived to be beneficial particularly for addressing language barriers. For example at primary school B the school uniform requirements were presented pictorially. At primary school A for example, parents could access school newsletters and guidance on how to support their child learning to read, questionnaires and the Ofsted report. The SESLP have developed a family portal for primary school C with information for homes, for example on how to support children with their homework. This portal also enabled access to English for speakers of other languages (ESOL) courses from the national institute for adult continuing education (NIACE) but this school wanted parents to study on the school premises rather than at home.

The local learning partnership had provided information about the learning platform and courses when parents collected the computer, provided one-to-one training on how to use the learning platform, created learning zones in local community centres for parents without internet access at home, run road shows and drop-in sessions, and produced booklets and guides. The

learning platform provided access to skills for life training resources such as ESOL courses from NIACE and other direct links, for example local job centre vacancies. The skills for life resources were originally available via the family portal but subsequently accessed via a direct link on the front page of the learning platform. An unresolved difficulty at the time of the study was that accessing the NIACE resources took users to the (external) NIACE site. A way of embedding these resources directly in the learning platform was being investigated at the time of this study.

Parents of secondary school students were given access in March 2006 and training was under way. This enabled them to access information relating to their own children such as attendance, attainment and some information on behaviour. When access to pupil attendance and achievement records was enabled for parents of children at the secondary school, usage data suggested an increase in activity by parents, possibly because they were able to check on attendance. Attendance would be of less interest for parents of primary aged children. Parents were also able to see what homework their child had been set, what had been completed and what was outstanding. One pupil perceived this to be negative! Twining et al (2006, p37) similarly note that not all children want parents to access detailed information relating to achievement and progress. One vision for the future (to address the time-consuming nature of printing and collating pupil reports described above, as well as the drain on resources) was to send parents all reports electronically. The secondary school family portal, that is a general area accessible by all parents, largely offered information about training courses.

In one of the primary schools the learning platform was being used to showcase pupils work and show photos of events. At least two parents were accessing the learning platform in this school regularly (although one was a member of staff at the secondary school). One pupil who went to India for six weeks to visit family was able to show them his animation work by logging onto the learning platform. The family took photos in India and uploaded them into the learning platform to share with the class.

It should be noted however that much of the functionality described above such as providing general information for parents and links to resources and training materials could be presented via a school website rather than being located within a learning platform. Similarly basic communication could be served by standard email use. The significant development is parental access to individualised data on pupil achievement and attendance. This had only been made available to parents at the secondary school and whilst evidence suggested that parents were making use of this facility it was still very early days (it could have been a novelty effect) and therefore difficult to draw conclusions. A senior officer of the LA felt that providing computers for homes had been the beginning of a culture change and made a good base for new government policies coming on stream to give computers to pupils. She believed that offering parents access to the learning platform in combination with a wide variety of strategies to support continued lifelong learning and stimulate parental involvement had already had positive outcomes.

Other ways in which staff are using the learning platform

Staff areas on the learning platform at the secondary school included resources to support staff training and development in assessment for learning. All training materials including those provided by the DfES were available for staff to dip into at any time.

Report writing was becoming easier for staff at the secondary school and the primary schools. For example, in one of the primary schools, the integration of the MIS with the learning platform meant that report templates could be automatically filled with individual student data such as SATs results. Staff could access this facility from home meaning that they could offering greater flexibility. In this particular school, staff were allowed to take a whole day (including the 0.5 PPA time) for report writing and could work from home if they wished. A bank of statements had been generated for the staff to use. The combination of using the statement bank and a template which was pre-populated with data where possible had made the task much faster and it was perceived to be much easier. It had replaced the report writing software the school had been using which they found to be problematic and inefficient (generating the same data twice thus repeating the same process and requiring reports to be exported into a word processor before being printed off).

It has had a huge impact for admin staff: "It really cut down on my workload and I just press a button on the day and they all print off and store against the children's records."

The facility to access the reports electronically from home offered greater flexibility about when and where teachers undertook this task.

Some teachers were using the platform to facilitate access to electronic resources at home rather than by transferring such resources using alternative methods such as pen drives. However, not everyone was doing so, particularly primary school staff.

The schools in the study were beginning to move documentation from paper-based to online systems. For example, at primary school A the starting point was the governing body. This was perceived to have saved a lot of administration time. Governor meetings at this school became paperless with the agenda displayed on the interactive whiteboard. All papers for the meeting were placed online eliminating the need to print out lots of documentation and distribute it, and saving time for admin staff. All communication is electronic.

At primary school B the IEPs were stored in the learning platform: "So if you want to pull out progress to talk to parents about, you have got everything on that child there. And we didn't have that before and that has made a vast difference to the way we report special needs to parents."
[Senior manager]

Staff were beginning to place lesson resources in the learning platform at both the secondary and primary schools. For example, at primary school C lesson materials were often provided for the supply staff who covered the PPA time for at least one teacher. Resources included presentations, word processed documents and useful websites. In some cases, attention was drawn to resources that could be usefully shared by placing notices on the 'stop press' area of the staff portal.

In one primary school the learning platform was being used to generate a repository of evidence of pupils' ICT skills. Pupils were selecting what they felt was exemplary work, and once the teacher had approved their choice, it was uploaded into the learning platform. This both provided a showcase of good practice and ensured that visitors such as Ofsted inspectors were able to access evidence of ICT attainment in one location (rather than searching through pupils' individual accounts).

Content development

Development of resources for the curriculum management system began in May 2005 and by July 2006 there were some 460 units (each about an hour's worth of learning resource). On the whole these had been developed by the content development team who were able to produce animations using flash. For example, teachers from other secondary schools in the authority working alongside the maths advisor had been commissioned to design resources to target the C/D borderline maths GCSE pupils. Funding was made available for 10 hours of storyboarding material from any department at the secondary school. The dance and drama department made the most of this opportunity at the time. Funding was provided for work undertaken in school holidays or during term-time. Similar arrangements were made for funding storyboarding by primary school staff. Service level agreements had been entered into (recording expectations formally) but at the time of the study only a very small number of storyboards had been generated, although the deadline for delivery had not been reached. Therefore, there had been an emphasis on content development for secondary level.

Protocols for creating content in-house had been developed ensuring that teachers (users) were involved in the process at several key points. Ownership and collaboration are key success factors in ICT uptake (Tearle, 2003; 2004). This process, described by staff as 'storyboarding' had been improved over time and had become more formalised as a result of becoming aware of the need for developers to be precise and communicate effectively with the teaching staff to ensure that their requirements were fully met.

Content development had become increasingly important, particularly it was perceived that selling content to schools beyond ICT Test Bed would contribute to sustainability. The cluster had tried to develop materials in-house. This had been achieved with varying degrees of success. There are challenges relating to creating content (tailor-made but time-consuming and even with reimbursement there has not been as much take-up as hoped due to lack of time) and buying in commercially available products (might not suit

needs or not necessarily easy to use). This is an issue that many schools and LAs are now facing (Harris, 2006; Twining et al., 2006). Another model under consideration involved students in Year 9 in the designing activities to be undertaken by Year 6 pupils.

Previously developed resources at the secondary school were moved from the school intranet to the learning platform in spring 2006. The only ones that remained on the intranet were large files such as video which took a long time to download from the learning platform. Access was faster on the intranet but it meant that these resources were not available outside school.

Some commercially available units for the learning platform had been purchased for use in science. Staff felt the content was appropriate but that the style of interface was not considered to be appealing. Furthermore, in order to use these units offsite, students had to install a special 'viewer' on their home machine, going against the philosophy of the learning platform, and additionally the units were causing the school system to crash occasionally when used in school. So the units were not assigned for offsite use and only used in lessons. At the time of the study there were not many publishers of units suitable for the chosen learning platform. The content development team investigated what was on offer but the preferred means of acquiring suitable content was to develop in-house. This was in order to create resources that would specifically meet teachers' needs, offering ownership and control, an important factor leading to successful ICT implementation (Tearle, 2003).

It was perceived that had the learning platform been in place from the beginning of the ICT Test Bed project that less commercially produced content would have been purchased and more of a focus on developing tailor-made content in-house:

<p>I think it would have been better if we had the [learning platform] from the beginning. We may not have purchased some commercial content. I think there is content within the school that is not particularly well used. [Content development team]</p>

It was noted that there was limited content available for primary schools in particular and also, that all content was not necessarily suitable for the specific nature of pupils in the catchment area (ie a high percentage of pupils from ethnic minority families).

As a delivery mechanism the learning platform was perceived to be much more efficient and much easier than "assign[ing] a website for every bit of software we did [which] was a bit of a chore." [Content development team]

The case of primary school A

With the support of other schools in the cluster, primary school A initially developed a learning platform from a different provider, here referred to as learning platform B. Having seen a demonstration at BETT 2003 and been

offered a free trial, and not being able to identify any appropriate tools already in the marketplace, staff felt that the solution they chose was better suited for primary schools. The member of staff from the provider was very enthusiastic and worked closely with the school business manager during the developmental phase of the product. The school were pleased to be helping to shape a product that would meet their specific needs and the needs of primary schools generally. It was believed to be challenging for some individuals in the cluster to really get a sense of the potential of learning platforms at this point in time when there was no opportunity to see the products in use in schools: *"We had this vague idea that we wanted VLEs but I don't think we saw the power or the possibilities of it as a group."* [Senior manager, primary school A]. At the same time the rest of the cluster were trying to come to an agreement about which learning platform to adopt. Staff at primary school A wanted to get things moving and did not want to be delayed. Whilst they continued to participate in the group's decision making process they felt that running another system in parallel could only be beneficial and indeed they found this to be the case initially.

The [other] primary schools were particularly interested in what we were up to. I think for them, it started to give them the idea what the [learning platform selected by the rest of the group] might be starting to offer. We had got those home computers in at that point and there was no content. That was always the issue that we'd given the computers out, because of the time the VLE was lagging behind giving out the computers, we were coming up to the summer holiday and we had [no content] to offer. That was the point that we decided we had got to get something in for the summer holiday. That was when the urgency became apparent. [Senior Manager, primary school A]

Primary school A purchased two interactive programmes from the provider designed for primary school children, one targeting Key Stage 1 and the other Key Stage 2, each with a substantial range of content, and also provided each pupil with an email address. In this way the solution was rolled out to pupils sooner than for the remainder of the cluster and was available in the summer of 2004. Links to useful websites were placed in the learning platform and these were believed to have been beneficial in relation to preparation for SATs. One of the packages (Key Stage 1) was used in lessons and the other (Key Stage 2) was used in the before and after school club and was perceived to have been helpful. Parents were provided with access to learning platform A. Areas which had not been developed included creating pupil pages to showcase work. Staff were able access for example meeting agendas and minutes, and a training package on fire safety that had to be undertaken annually. A senior manager created a discussion group for staff but no-one had responded, again supporting claims from Tearle (2004) that users of a technological tool need to understand its purpose and potential.

The individual from the provider with whom staff at primary school A were working closely visited the school regularly and pointed out aspects of the functionality, providing ideas for further development. However after an initial

push, this person left the company and the momentum seemed to be lost. The company did not seem to be interested any longer in developing the product for primary schools.

Although both platforms were still being run in parallel, emphasis began shift to learning platform A (that selected by the remainder of the cluster) partly because the MIS could only be accessed via this route. There were clearly benefits to be had with this approach. For example, there was a substantial amount of content development underway which was only available through learning platform A. Together with the MIS which was integrated, it was perceived to be more powerful and professional looking, and less restrictive than learning platform B which primary school A had opted for independently. learning platform A was also seen to be beneficial for cross-cluster sharing and accessing content. The servers for learning platform A were hosted locally whereas the servers for learning platform B were hosted elsewhere which undermined the sense of ownership and control. However the staff at primary school A effectively had more control of their own solution (they could create users for example) whereas to create new users in learning platform A they would have to go through the content creation team at the secondary school. The email system in learning platform B was closed such that pupils could only email other users within the environment. This had benefits in terms of increased security but was found to be quite limiting. Most importantly the advantage of a group solution, backed by a content development team, was the continued development and maintenance. Undertaking such a development as a single organisation was not cost-effective in comparison to many institutions working together (although this approach offers less control and hence less flexibility).

As staff at primary school A access the MIS system daily for electronic registration, the SMT decided to set-up the school diary, noticeboard and discussion groups here rather than directly within learning platform A. At the time of the study both platforms were still in development but staff were considering focusing on learning platform A only as they realised that running two systems concurrently was a barrier to change. Staff were planning to move documents that required home access such as planning to learning platform A, leaving other documentation on the school intranet.

Achievements and factors associated with success in relation to the implementation of the learning platform

In the secondary school it was perceived by the LA that there had been significant progress. The factors contributing to this were perceived to be the content development team and strong leadership. The learning platform had been most successful in schools that were proactive through the involvement of individual enthusiastic staff.

Transforming teaching and learning

Sharing ideas was happening within schools rather than between schools.

There doesn't tend to be much sharing of resources, physical resources if you like, but what there has been is a sharing of ideas. Because the information, because all the planning here is uploaded every week and it's visible to everybody, because of the transparency of the thing, there has been a sharing of ideas. One of the teachers actually said to one of the others, 'I saw that you were doing such and such in your planning. That is a brilliant idea. Can I use it?' Now had they had their planning in a folder stuck on their desk that would never have happened so there is a sharing of ideas more so than actually learning resources." [Content development team]

Sharing resources and planning amongst teaching teams had also become much easier as once the documents were uploaded they were accessible by any staff:

I was off ill at the beginning of the year, and it just happened to be a Sunday night that I was ill, so it meant that the planning was already up there so there was no problem for the next day regarding cover. [Teacher, primary school]

Home access meant that staff were able to be more organised and to work at times that were convenient to them rather than being forced to stay in school in order to store and access documents on the school intranet. The flexibility for staff offered through ICT was also recognised in the pathfinder project relating to the workforce reform agenda (Butt et al, 2004). The learning platform enabled staff to enhance delivery, manage and organise their workload, and collaborate and communicate more easily with other stakeholders.

Email improved communication between staff especially for those who had an early lunch break. It enabled staff to communicate with colleagues at any time and feel 'less isolated'. The communication tools embedded within the learning platform were perceived by many of those interviewed to be one of the strengths:

It's got communication built into it. It's got more of a community aspect to it. It's not just a content delivery route, it brings people together in a much more efficient way I think. [Content development team]

The focus in the secondary school at the time of the study (March 2006 – July 2006) was on implementing an online homework facility in English and maths in Year 7. Some staff in science had been trialling resources but the system had not been implemented across the whole department due to the range of teachers' experiences of ICT (a common issue with ICT implementations per se as identified by John & Baggott la Velle, 2004; Cuthell, 2005). More generally, it was perceived to be very effective and to have had a positive impact on levels of homework submission which has been problematic in the past. It was believed to be more motivating for lower ability children and

effective for high ability children. It had a positive impact on workload for staff who were using it regularly. Previously, chasing up outstanding homework used to be a laborious process. In relation to other year groups, use was adhoc and it had not yet been embedded.

The learning platform had proved to be beneficial for providing repositories of content to which schools could subscribe. (Previously the content was held on the internet and was less secure.) A particular example was the primary languages site. It had been set up as a community and therefore offered the same range of communication tools including a noticeboard to alert subscribers to training events and new resources for example. Resources included those for use with interactive whiteboards and units for use within the curriculum management system, largely flash based. Activities had been designed for cross-curricular uses and included for example some which were number-based.

School management

The learning platform could be set up with a staff homepage for an individual school within half an hour, providing a school diary, news and stop press facilities, and other information.

With a normal website, or with one of the other products, it wasn't that easy to do that. So that is a quick win, and when we launched in the schools the first thing they did was use the diary." [Content development team]

Thus as a school management tool, it was quick to set up and easy to use.

The ability to access the learning platform from home was much appreciated by many staff.

One of the thing that I found very valuable when I was part-time, I could go on at home and see what was going on. If I needed to write a message or post some news I could do it from home, so it was invaluable for me to actually keep track of what was going on within the school. [Teacher, primary school]

There were concerns relating to pupils' email use and etiquette. One primary school had set up protocols which stated that pupils should not expect responses from emails to staff immediately (an expectation arising from their experiences with instant messaging) and that language should be appropriate. Due to security concerns pupil emails were based on alpha- numerics rather than their names but pupil names could be used as an alias internally. Children were instructed not to email anyone they did not know. School staff had some concerns about pupils disclosing serious problems via email and it not being picked up straight away. However, if email makes it easier for children to express their feelings about such serious issues then it might bring such matters to someone's attention more promptly.

Change management

The learning platform was largely introduced to staff in small steps with training, slowly replacing previous paper-based systems with electronic ones. There was a strong drive by many individuals to identify 'quick wins'. One such example which was used as a catalyst for change was the switch from a web-based email system to the email system embedded in the learning platform. This has subsequently been used to raise awareness of other communication and management tools provided with the learning platform.

Getting them to do simple things, like just sending us announcements to put on the [learning platform]. I think that was hard for staff to suddenly go from using memos in trays to thinking well I can post something that everyone can see and I don't have to post letters in everyone's trays."
[Content development team].

A wide range of other 'hooks' was devised by individuals to increase usage of the learning platform. For example, one teacher organised a 'Sudoku challenge' with a small weekly prize which was considered to be successful.

Early adopters (selected in many cases as 'learning platform champions' due to their enthusiasm) acted as a catalyst for others, and accelerated the processes of developing the learning platform and embedding it into management, teaching and learning. They were provided with training from the national remodelling team staff, the content development team, the LA adviser and Becta. They then returned to their respective schools to cascade what they had learned through staff meetings and informally. This approach has been successful elsewhere (Tearle, 2004; Russell et al., 2005; Harris, 2006). However, this strategy has not been without its problems (see below).

Effective support structure

The establishment of a content development team (of 10 employees at the time of the study) undoubtedly contributed to the success of the learning platform within the cluster. The team was established prior to the introduction of the learning platform and was initially responsible for developing online resources and websites. In relation to the learning platform, the team was responsible for setting up new school sites (including the basic structure, email accounts and user logins), providing technical support, developing online help resources to enable users to develop the platform in their own schools and creating content. The team was supported by a company which initially helped to design and develop the chosen learning platform at the secondary school. A representative of this company visited approximately once a month to help the content development team to deal with any problems.

Parental involvement

A successful strategy in relation to parental support was to identify and employ 'learning champions'. In the ICT Test Bed project there were three, two of whom were parents.

“One was just somebody [from] outside the area. He was very intelligent; he knew the area very well; he had actually had some ICT training. He had been a tutor for adult education; he could speak their language; he was still down to earth and could still engage with them.” [Learning co-ordinator]

These champions talked to parents when they initially came to collect their computer from schools or in the library or at the school gates, dealt with problems, and encouraged parents to enrol on courses and visit schools. *“Engaging parents before the [learning platform] was very difficult.”* [Learning co-ordinator] It was believed by staff that many parents had become more ICT skilled, more confident, came into school more and chatted about homework amongst themselves, with their children and with school staff.

Challenges in the implementation of the learning platform

Change management

There were the usual barriers such as resistance to change and lack of time. There was a perception by some staff that there was much to learn and discover but insufficient time to do this, the result being that *“you use what you are familiar with.”* [Teacher, primary school] This is not an uncommon phenomena as evidenced by Mumtaz & Hammond (2002) in their study of word processor use for literacy learning in Key Stage 2. There was a perceived need for teachers to appreciate the potential and believe that the effort required to change practices will reap rewards (eg Tearle, 2004) and this requires effective change management:

[Using the learning platform forms] another step. You’ve got to put [resources] in, create [new resources] and put [them] in the [learning platform and] you’ve got [to adapt to the new system]. [...] [P]eople would say that they haven’t got the time [to learn the required skills]. But if [the learning platform] is a powerful tool, [teachers] would do it. I think it is not powerful enough yet. It is not as useful as people wanted it to be. As soon as people see the [potential] they will use it. The resistance disappears. It is not resistance to change or resistance to the technology, just [a lack of understanding of what it can offer]. I guess that has to be driven from us.” [Senior manager, primary school]

The change management strategies employed were differentially effective:

Change management strategies have been most effective where full senior management support has been given.” [Senior officer, LA]

Each school was asked to send two members of staff to change management training for the learning platform implementation in December 2005. They were asked to send a member of the senior management team and a ‘mover and shaker’ who was a respected member of staff. Where full management support was given this requirement was addressed fully. Irrespective of this,

those selected did not always maintain their role either due to leaving the school or because they found the additional workload to be too much. In addition attributing the title 'learning platform champion' to these staff caused ill-feeling in at least one of the primary schools as it was interpreted as expertise (whereas it was intended to represent enthusiasm).

As well as providing learning platform facilities for schools outside the cluster (all secondary schools in the LA, some primary schools and schools from outside the LA and the UK) sites have been developed for other groups such as gifted and talented co-ordinators. However, use was limited and once specialist funding disappeared (and individuals moved on) sites became inactive. This is perhaps due to the need for groups to self-drive such initiatives and again relates to change management. Someone from within such a group has to take responsibility for ensuring that cultural change occurs. That is successful innovations with ICT are underpinned by strong leadership (eg Scrimshaw, 2004). It could be that the group(s) could not see a need for using the learning platform, preferring instead to use existing systems and practices.

Primary school A had not begun to make the most of the cluster solution as they had implemented a solution as an individual institution rather than within a group. The staff and pupils were not engaging with it to the same extent as some of the other schools in the cluster. Pursuing an alternative meant that they did not take the same steps as other schools to embed the technology such as identifying learning platform champions or providing staff training (although they could have adapted such strategies). There are clearly benefits relating to everyone being in a similar situation which means that a maverick approach does not always reap rewards, although the intentions behind following a different pathway were well-meaning (and justifiable in a project intended to be a test bed). Despite implementing a learning platform before the rest of the cluster, a senior manager acknowledged that in terms of development the school had not made as much progress overall in this aspect.

Technical and functional limitations

The chosen learning platform was not designed for use across institutions so the original schools' 'shared site' did not provide full functionality (no surveys or questionnaires for example). To overcome this, another 'institution' was created which everyone had access to (all schools using the learning platform, not just ICT Test Bed schools). This site provided shared resources and a library of useful websites, and some school staff had begun to request advice and information. However, staff were not visiting this site regularly, tending just to use their own school site. As a result, the content development team sent emails to all teaching staff when information had been updated but this is not an efficient or desirable activity.

The learning platform was perceived to be largely reliable and effective but with the inevitable technical problems that occur when products are in development. For example, when homework was marked it appeared at the

bottom of a list of all homeworks set during the year, so that students had to scroll down to locate it and find out how they had done. In an early version of learning platform B trialled by primary school A it had been difficult to update the content but this had been made much easier in a later version. Another problem relating to the curriculum management system was the need to upload resources into two areas – the shared area for a department (to enable shared access) and the curriculum management system which operated as an independent application located within the learning platform. As well as duplicating activity perhaps unnecessarily this also required staff to login twice, once to each storage area.

School staff worked with the developers of both learning platforms (A and B) to ensure that subsequent product releases will resolve technical difficulties such as these. At the time of the study the curriculum management system was described as being ‘push out’. That is students were only able to undertake activities that had been assigned to them. It was possible to undertake other activities within the learning platform but the outcomes of these were not recorded for individual students. In order to truly support personalised learning the curriculum management system needs to enable students to choose their own pathway through resources. This should be provided when the current homework management system is replaced by a new module, a beta version of which should be available in the autumn term of 2006. Following testing, the secondary school plans to implement this upgrade in the summer of 2007. At the time of the study, in order to access the curriculum management system at home teachers had to download a client onto their home machines to create resources and assign them. This may have acted as a deterrent for staff who were not confident ICT users. This technical glitch should also be resolved through future system releases.

The integration of data and automation of services is desirable but not surprisingly proved to be a challenge initially as different providers (of learning platforms and MIS systems) worked together with school staff to identify solutions. This problem seems to be a major block for many other schools (Harris, 2006; Twining et al., 2006, p31). At the time of the study, content development team staff were trying to resolve technical difficulties in relation to linking the existing MIS to the learning platform. The desire was to ensure seamless integration of all systems. So that for example, when a new student was created in the MIS (ie on entry to the school) a profile for the student would automatically be created in the learning platform. The technical difficulties were believed to lie within the MIS system.

Interoperability issues were also causing some concern in relation to sharing across learning platforms in order to work across regions rather than within local clusters of schools:

“What you don’t want is 24 different processes before you can actually share. It has to be something that is easy and practical to use. [...] We need robust national interoperability guidance.” (Senior manager, LA)

Teaching and learning

There were issues that had not been resolved surrounding activities that cannot be easily marked automatically such as English composition and whether or not this approach generally over-mechanises assessment. In modern foreign languages at the secondary school for example the curriculum management system had been used for end of unit assessment. Staff in the department evaluated this in relation to traditional methods and believed that whilst such an approach was beneficial for assessing listening and reading, more teacher intervention was required to assess speaking and writing. Assessment of these two core strands of language learning cannot be so easily automated. However, it was possible for pupils to enter text responses rather than just select multiple choice responses, and one teacher noted that perhaps a cultural shift was required. Nevertheless, it is possible that such a system might influence teachers to focus on those elements which can be easily assessed – another variant on teaching to the test!

There is also a need to ensure that the assignments contribute effectively to teaching and learning through moderating assignments and uses of the curriculum management system. Teams of staff creating assignments together or commenting on each other's could help with this. As a senior officer at the LA noted:

It takes the routine admin work away for the teachers. [...]But again the strength [of the curriculum management system] will depend very much on the quality of those assignments. [...] It gives the access potentially but again it depends what goes in there. If there is a raft of closed activities in there and no encouragement to go beyond, you will not have autonomous creative learners.

It was perceived (by the LA) that the national primary strategies had not yet harnessed a strategic approach to ICT and this had inhibited developments in the project primary schools as well as more generally.

National delivery models, training – it's not modelling at the moment what we would want to see and it's not flagging yet the things we would want to see [in terms of ICT]. And there's that lag there that's giving us some tension I think." (Senior officer, LA)

In this LA, one approach to resolving this has been to integrate the ICT consultants within the strategy teams.

There were also tensions between safeguarding and protection issues, and learner autonomy. This in turn could inhibit the full potential of personalised learning.

Management issues

The scope and scale of the implementation used a lot of resources, some of which may have been more effectively deployed according to the perceptions of the LA:

“[I]t is an important development that really systematizes ICT instead of being bits and pieces here and there. It’s big, it’s scary and it takes a lot of resource. [...] [I]t takes some serious project planning at a time when a lot of other things are going on.” (Senior officer, LA).

As a trailblazing project it is perhaps not surprising that a huge investment of resources had to be made and demands on capacity were high. It highlights the need for effective change management strategies and meticulous planning. The LA also had concerns about whether there was sufficient capacity to support the primary schools’ development, given the significant demands of the implementation and the differing context of primary schools.

‘Behaviour event recording’ in the secondary and primary schools was still being addressed. All schools involved in this study were facing the challenge of how to deal with information about children; what to keep private (internal to school staff) and what to make public (available to parents). An upgrade to the MIS system should make this process easier in the future by developing separate entries for parents and staff.

The day-to-day management of the learning platform was an issue. There were staff concerns about workload. There “needs to be a delineation of roles and responsibilities” [content development team]. The workload could be shared. For example, primary school pupils could be supported to manage the class homepages and create activities either for their peers or for younger children. As another example, there was a perceived need for wider staff involvement in maintaining information for parents; leaving this responsibility to one individual without additional support proved to be challenging. Staff noted that linking school and home with ICT cannot be relied upon as the sole means of communication which means it has to be run in parallel with other systems, perhaps requiring duplication of activity. In relation to managing the stop press section, notifying staff of illness and supply arrangements, the responsibility needs to lie with staff who arrive early (not admin staff) such as a member of the senior management team.

LA staff noted that suitability for primary schools is key as is the ability to tailor the system for individual schools. There were some concerns about whether it is the right approach for the earlier primary phase, and this is an area for further evaluation.

Organisation of resources was problematic in at least one primary school. Documents such as planning were placed on the learning platform without initial consideration of how to organise them and eventually retrieving them became unmanageable. As a result, staff returned to using the intranet to store such documents which meant that they could no longer access them from home. In another primary school a similar problem arose but staff identified a solution using the learning platform which enabled staff to change the ‘views’ such that you could access planning documents for specific year groups. The same approach has now been applied to managing classwork and homework. At the secondary school the resources were organised by

department and linked electronically to schemes of work, ensuring that access to shared (and consistent) resources was easy.

Staff turnover inhibited the embedding of the learning platform, particularly in the primary phase. Changes of headteacher in five of the seven primary schools impeded progress. The importance of support from senior management in driving educational change in relation to ICT has been well-documented (Scrimshaw, 2004; Harris, 2006; Twining et al., 2006, p77) and was also identified in this study:

“At least for it to be a success, it has to be driven by key people, yes. But they must have the whole support of the head and [their] strategic involvement to be embedded.” [Teacher, primary school]

For a period of time at this school there was no headteacher and this delayed dissemination about the learning platform. It also meant that staff did not place as much importance on the learning platform as they might have done with strong direction from leadership.

It was perceived (by the LA) that the school-managed approach meant that sometimes the leaders did not listen to external advice which might have been helpful in resolving or avoiding some of the difficulties encountered. This innovative approach is changing accountabilities between schools and the LA. An additional layer of complexity had also been introduced with new types of relationship: school as provider and schools as their customers. This different approach has meant that some LA staff and individuals have not always felt totally comfortable. For example, some interviewees commented that the school-managed approach had led to some resistance and resentment from other schools in the area. However, this approach was supported by the LA, has been beneficial in other ways and school-led collaboration was being increasingly encouraged.

As email traffic increases so does staff workload (particularly at management level):

I find it one of the more stressful parts of the working day, that I switch on and cross my fingers that [the number of new emails is] going to be single figures. [Senior manager, secondary school]

It has thrown up some interesting management issues. How should a school deal with individual members of staff who have begun to send many emails to colleagues? Does sending an email pass responsibility onto the addressee and act as closure for the sender? Is email prioritised in relation to conversations and traditional letters because it is easily accessible? Should a school encourage parents to communicate via email and if so, what happens if traffic becomes unmanageable? Cunningham and Harris (2003) for example found primary teachers felt somewhat reluctant about allowing children to contact them via email outside school hours and relatively few teachers comfortable about this during school hours; in practice few emails were

received though they surmised this situation might change as email became more prevalent means of communication. Perhaps there need to be clear procedures and guidelines for its use more generally as well as in relation to pupil and parent use and security issues. This is in line with issues found in more general business email usage, and again, lessons can be learned from elsewhere in developing those procedures.

Project specific issues

In primary schools setting online homework was hampered by delays in providing home access to computers and internet services. The temporary solution was to provide work on disks. Even at the time of the study many homes still did not have internet access because they did not have telephone lines or did not come forward and identify themselves for the provision.

Support structures and workload

There was a strong focus on content development which has caused some concern for the LA particularly in relation to the primary schools. The LA was trying to raise awareness of managing existing content and communication tools within the learning platform, which had the potential for 'quick wins'.

One teacher noted that there had been some minor delay in generating resources due to inevitable development bottlenecks both within the content creation team and because of limitations of staff time. One solution was to buy in ready-made content but there was still a requirement for staff to identify which elements would be useful. Although funding was made available for teacher development of units for the homework system it was problematic. At primary level, funding was made available for 136 units but only four had been developed at the time of the study.

As a cluster of schools leading the development of learning platforms, the content development team and the 'learning champions' found there to be a lack of external support and working examples.

"And there was no training available then because it was very new, especially to the UK. And there were no books on it or anything really so we had to basically train ourselves up and just have a play. We did try to get information from the states on the website and stuff. But it was basically learning ourselves." [Content development team]

Obviously over time this should no longer be problematic.

Parental involvement

Challenges for involving families in the learning platform have included a lack of ICT skills and lack of confidence (also identified in Cranmer's study, 2006) technical faults, losing passwords and language barriers. In an area of deprivation with high levels of mobility, staff noted that many families had concerns about providing information, which could act as a deterrent to participating fully in a learning community.

I don't know why it is but we have things like questionnaires, parental questionnaires and they are not being filled in. I think there is a certain amount of fear from the parents about giving out information. [Content development team]

Staff at primary schools expressed concerns that online communication and dissemination means that parents could see less need to come into school. This could have implications for provision of ICT resources in schools which should be meeting the needs of the community, but potentially could be underused. However, in ICT Test Bed in this cluster face to face engagement was a key element for encouraging use of ICT with families. Learning Champions attached to each school ran coffee mornings and non-related ICT courses all with the aim of developing relationships to provide the opportunity for deeper understanding of use of ICT.

Sustainability

Income generation opportunities will be maximised in order to sustain the content development team. The LA has identified some funding to schools to support the financing of the learning platform development. There is an expectation that schools will fund the learning platform partly from the school budget, and incorporate ICT provision fully in their financial planning with the cessation of 'earmarked' ICT grants from government:

"We're currently pointing schools to the national guidance that roughly one third of your devolved formula capital should be spent on ICT." (senior officer, LA)

It is intended that both content and learning platform expertise (particularly implementation) will be marketed beyond the LA. Staff had been appointed to act as advisors to potential new schools, providing a strategic overview of what can be achieved and information about the funding and content for example.

Future developments

The secondary school was developing individual learning plans which were due to be piloted with Year 9 pupils first. This would offer the facility for e-portfolios by recording targets set and linking them to evidence. Future software releases were expected to enable blogging and wikis. The secondary school was also investigating offering online mentoring services for students, facilitating virtual classrooms using VOIP and web-cams, using texting services to alert parents to events, and connecting to the cashless dinner system so that parents could see what students had bought for their lunch. Staff were also considering whether or not to enable instant messaging. The longer-term sustainability of the platform service is being planned for with the LA through a trust mechanism and by the LA seeking to incorporate provision into the building schools for the future programme.

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