OECD/CERI ICT PROGRAMME

A Case Study of ICT and School Improvement at

Highgrove School

Development of a computer based student tracking system in order to monitor student progress

6-10 November 2000

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Contents
Page No.

1. EXECUTIVE SUMMARY

1. **Introduction**

As part of the OECD qualitative research Case studies of Organisational Change this study was carried out during 6-10th November 2000 at Highgrove School[1].

The data collection was carried out by means of:

1. Interviews with teachers and children, administrators (headteacher, governor), students, parents and technology specialists.
2. Observations of school functioning including Year 7 Parents Evening.
3. Collection of school documentation.
4. Survey of teacher ICT practices.

The research focused upon a major whole school reform and the part that ICT has played in that reform. In this case the whole school reform was the school s development and implementation of student tracking systems providing data for parents, teachers and students for the purpose of monitoring student achievement and setting goals and targets. The system also allowed the comparison of the performance between teaching groups.

1.2 The whole school reform: **Development of a computer based tracking system in order to monitor student progress.**

The school s initiative to build a comprehensive database holding the data on all students was intended to facilitate monitoring of individual students progress and achievements throughout their whole school career. The intention was that the use of the system should:

- enable classroom teachers, form teachers and heads of year (HoY) to review students performance at anytime;
- ensure that students who were underachieving could be identified;
- encourage students to monitor their own progress against their personal targets, which they have set

with their teachers;
- provide detailed information for parents, students and teachers about a student s estimated capability and current achievement.

1. **Evidence relating to the research hypotheses.**
2. **Hypothesis 1: Technology as catalyst or as additional resource?**

The evidence supported the rival hypothesis that ICT was not the catalyst for change but was an additional resource supporting changes that were initiated by teachers. Procedures for monitoring pupil achievement at an individual level were of concern before software to manage this process was available. The evidence supports the hypothesis that the forces which drove the improvements (i.e. teachers desires to monitor students progress more closely) also drove the application of the technology to this specific educational problem.

1. **Hypothesis 2: Traditional diffusion patterns apply or is the diffusion pattern of ICT innovation different?**

Overall the evidence supported the hypothesis that traditional patterns for the diffusion of innovation applied. However, there was some evidence to suggest that a skills deficit maybe an additional factor related to ICT innovation which hinders the diffusion of an innovation.

1. **Hypothesis 3: Staff ICT competence is critical or are infrastructure and student competence more important?**

The data supported the hypothesis that teacher competence was a critical factor in the successful implementation of the ICT related reform, rather than student competence or technical infrastructure. Teachers needs placed demands on the infrastructure.

1. **Hypothesis 4: Is the gap between more and less advantaged students stable when ICT access is increased?**

The data supported the hypothesis that with equal access to ICT, gaps between the high and low poverty students would not increase. Students had high levels of access at school and home. Student background (i.e. advantaged or disadvantaged) was not cited as a critical factor influencing either student use of ICT or student achievement using ICT.

1. **Hypothesis 5: With improved ICT academic standards will stay the same or increase, or decrease?**

The evidence supported the hypothesis that successful implementation of ICT leads to the same or higher academic standards. There was a small amount of evidence that some time is wasted by students who are unable to deal with the amount information obtainable from the internet.

1. **OVERVIEW**

Highgrove High School was a large co-educational secondary school (11-18yrs) located on two separate sites on the outskirts of a large city. The school catered for students at Key Stages 3, 4 and 5 (age 11-14/Years 7-9; age 14-16/Years 10-11; age 16-18/Years 12-13) of their education. The students

attending the school came from a range of backgrounds. Seventy per cent had English as a second language and 18 per cent were eligible for free school meals (a socio-economic indicator). The number of students on roll at the time of the data collection was 1914, including 450 in the Sixth Form. Around 60 per cent of students overall (and 80-90 per cent in the sixth form) reported having a PC at home, with at least 40 per cent having Internet access.

The school consistently received many applications above its Published Admissions Limit of 300 each year. The school allocated 15 per cent of admissions according to a child s performance in a special entrance test. The remainder of places were allocated according to four admissions criteria: where the child had a brother or sister currently attending the school; where the child s parent/guardian was a member of the permanent staff of the school or one of the four local primary schools; where the child had an exceptional medical condition and needed wheelchair access; and where the child lived near to the school.

The curriculum at Highgrove High, in common with other state secondary schools in England, was determined by the National Curriculum. Specific Orders for each subject outline the content that should be covered, although teachers were free to use a range of teaching and learning approaches. From the inception of the National Curriculum in 1989, there have been three core subjects (English, mathematics and science) which were compulsory in state schools for students aged 5-16; from September 1998, Information Technology (as it was then called) was added to the list of core subjects. Again, schools had flexibility in determining how students should cover the ICT curriculum, either by learning it as a separate subject, or by using ICT as a resource to support different subjects across the curriculum. One teacher commented *ICT is taught as a distinct subject in Years 7, 9, 10 and 12. Cross curricular use of ICT is also well-established* .

The focus of the case study at Highgrove High School was the use of a whole school tracking system to provide data to parents, teachers, and students in order to monitor student achievement (compare current achievement with predictions from a variety of tests), set goals, identify areas which students needed to focus on and compare differences in performance between teaching groups. The sharing of some of this data (e.g. NFER Cognitive Abilities Test (CATs) results) with parents, as Highgrove staff do, is not common practice in English schools. Teachers within the school used a combination of paper-based record keeping and computerised record keeping. Staff had developed the school s own computer database for storing records on individual student achievement: data entered included the results of formal assessment (at least twice per year) and grades allocated by teachers for course work. The data stored recorded students achievements in different subjects, and teachers could use this information to set targets for classes, groups and individuals. The school was moving towards students having greater involvement in agreeing their own targets on the basis of their past performance tracked using the database.

The Information and Communications Technology (ICT) coordinator commented on the ease with which the system could be used by teachers throughout the school, saying that *From the users point of view you just press one button It is easy to use...* .

Highgrove High catered for the school years 7-13. After students had taken formal tests (NFER CATs) in Year 7 (aged 11-12) and Year 9 (aged 13-14), their parents were invited to the school for an evening of discussion regarding the results of the tests. The parents were invited to work with the school to ensure their child built on the baseline provided by the tests. At the end of Year 11 (aged 15-16), students were presented with a Record of Achievement which recorded achievement in all areas of school life.

The data tracking of each student was particularly well developed for target setting once a student reached the Sixth Form. Prior to the beginning of each term, subject teachers negotiated a Target Minimum Grade (TMG) with each student as well as three Individual Learning Targets, which were designed to help a

student reach his/her TMG. At the end of each term, subject teachers met with students to assess whether or not targets had been met and to agree new targets for the following term. All of this was recorded on an Individual Action Plan. The use of the computerised data tracking system enabled the school to produce Grade Reports each term documenting students levels of attainment alongside their TMGs, as well as internal test results.

The Individual Action Plans and Grade Reports form part of the Sixth Form Record of Achievement, alongside participation in sports, extra-curricular activities and work experience, therefore providing a detailed picture of all aspects of a student s achievement and progress.

As the school took students from age 11-18 years (key stages 3 (years 7 to 9), 4 (years 10 to 11) and 5: (years 12 to 13)), all students had previously attended different schools from 5-11 years (key stage 1(years 1 to 2) and 2 (years 3 to 6)). Both parents and students were therefore only able to contrast the levels of resources, the availability of data on their child s progress and use of ICT at Highgrove High with those experienced at their children s primary schools. Without exception they indicated that they were impressed by the school s openness and honesty about student data and that having their own child s data had helped them to participate more fully in their education. A group of Year 7 parents, who had just received their child s first formal test results since beginning at the school, commented on how they were amazed that this procedure was not common to all schools.

The students who were interviewed were also very positive about the student tracking system, the majority of whom said they had felt encouraged by seeing their results, either to do better in a particular area or to continue working hard. Some teachers whose children attended other schools commented that, as parents, they did not have the access to their own children s data that they wished for.

1. **THE PAST**

There have been considerable changes in the area of ICT in recent years at Highgrove High School, especially in the development of the whole school tracking system. The headteacher took a lead in this process of development.

The development of ICT within the school proceeded in two main stages. The first stage began in 1988 when the headteacher decided that their investment should focus initially on the administrative use of ICT. He gave the administrative staff dedicated tasks to perform and brought in Apple Macintosh computers, encouraging the staff to improve their ICT skills in general, and in particular to take National Vocational Qualifications.

The second stage of his whole school plan was to have computers in all classrooms. Many of the current staff can remember the school having BBC computers, followed by an Archimedes computer network. The first student tracking system was developed using the BBC computers to help students pick their options and make future course choices. With the demise of the BBC computers, the school looked for another system but staff were unable to find hardware available on the market that would suit their needs. This resulted in the school developing their own system, using Claris Filemaker (Version 3), which they used extensively, initially to help with options and issues relating to the curriculum, but later, with the help of the Technology teacher, to collect and give an overview of students grades.

***The innovation in its current form, was initially led by one of the deputy headteachers, and latterly more departmental leaders including the ICT coordinator have become involved. The ICT coordinator now has the responsibility for the re-designing of the database* (teacher).**

The headteacher also said,
I encouraged a former head of ICT to become more of a manager than a curriculum deliverer and we contacted a number of organisations to provide hardware, software and guidance. I pushed for improved resources...I have to encourage, but a policy is needed as well. I initiate a lot, but the direction is informed by the teachers because they understand the potential use.

The headteacher believed that the use of ICT requires commitment from teachers and in the last few years he has tried to create a *climate where teachers are confident in its use* .

1. **THE PRESENT**

The ICT coordinator spent time with a consultant designing the structure of the database so that all teachers in the school could access and use it easily. The headteacher had wanted the broadest possible use of the system and for all teachers to become skilled in its use and for schemes of work to be informed by it.

The benefit of this system was related to the teachers access to the student data stored on the database, which could be easily shared and discussed with students and parents at appropriate times throughout the academic year. The tracking system also enabled teachers to use the data for the purposes of grouping students into classes or sets , and for targeting students who were underachieving.

The school used tests designed to measure students ability to predict their academic achievements in subsequent examinations. Students sat the NFER CAT tests in Years 7 and 9, which gave an indication of their potential performance in the mandatory tests in English, mathematics and science at the end of Year 9. The following year (Year 10), the students sat which were designed to give an indication of student performance in their GCSEs (General Certificate of Secondary Education) in Year 11 (the Year 11 Indicator System (YELLIS) tests: http://www. cem.dur.ac.uk/yellis). Students who studied at the school s sixth form also sat tests in Year 12 to give an indication of performance in A-Level (Advanced Level) and GNVQ (General National Vocational Qualification) examinations at 18+ (A-level Indicator System (ALIS) tests: http://www. cem.dur.ac.uk/yellis). One teacher commented:
We know which students we can make a difference with turning potential into performance. We can use the data to set realistic targets and keep parents informed and involved.

Teachers had different levels of involvement with the student tracking database. Subject teachers were

expected to enter the grades for all students in their classes. Those with managerial roles also had to know how to analyse the data and, therefore, training had been given at various levels. Several teachers commented on the benefits that the tracking system had afforded them. One teacher said: *I know more about them* [students], *there s now more linking with the curriculum.*

Within each Key Stage, particular teachers were responsible for specifying the content for the records in each year group. Heads of year and heads of department could trace students performance in all subjects, enabling them to have a better understanding of a student s progress. At Key Stage 3, the headteacher of the lower school was responsible for overseeing the entering of grades onto the database each term. He also manipulated the data, enabling him to provide feedback to teachers, parents and students. The data recorded at Key Stage 3 included results of the National Curriculum Assessments and NFER Cognitive Abilities Tests (CATs). Progress on students performance was reported to parents at an interim stage and in the form of an end of year report. The database allowed students progress to be monitored at two points each year throughout Years 7, 8 and 9. The headteacher of Key Stage 3 explained the benefits of the database for the lower school:
It helps identify the students I like looking at the verbal reasoning scores so that I can find out who the weak linguists are and target their literacy skills.

At Key Stages 4 and 5, the responsibility for tracking students progress fell to the relevant Key Stage heads. Again, students achievement and effort grades were entered for each subject and these were reported to parents as interim and end of year reports. In addition, Target Minimum Grades (TMGs) were set for students which were predictions of the grades that students would achieve in examinations at 16 and 18 years of age.
Other teachers suggested ways in which the system had improved their knowledge and understanding of ICT, as well as helped them in guiding their teaching practices and preparing lesson plans. *It gives a profile of the group this helps you decide how to pitch the delivery of a lesson, how to pace it* (teacher).

Students had also benefited from the tracking system in a number of ways. The factor mentioned most often was that they have more information about their performance which allowed them to discuss any problems with their teacher and focus on specific areas of weakness.

1. **MAIN HYPOTHESIS**
2. **Hypothesis 1: Technology as catalyst or as additional resource?**

Technology is a strong catalyst for educational innovation and improvement, especially when the World Wide Web is involved. The rival hypothesis is that where true school-wide improvement is found, technology served only as an additional resource and not as a catalyst, that the forces that drove the improvements also drove the application of technology to specific educational problems.

1. ***Evidence in support of hypothesis 1:***

1. ICT was a catalyst for this reform. The development of the school system started shortly after the computers were introduced into schools. Without ICT, the system would not operate. Support for the concept of using ICT to monitor student progress closely came from many teachers.

- [We] *can not function without it* [ICT]. *We d move so far back. It s difficult to see how any school could say they weren t reliant.... Administration would be extremely difficult* (headteacher).
- [We] *could not function at this level of complexity. We d still be setting targets but it would be harder to achieve* (teacher).
- *Ultimately we see it* [the tracking system] *as a system for saving time and a way of targeting underachievement. It is an essential tool for helping grades increase* (teacher).

1. ***Evidence in support of the rival hypothesis:***
2. Although ICT may have acted as a catalyst in allowing more sophisticated systems of student monitoring to be developed, the ethos within the school was established through the style of leadership adopted by the senior management team. The headteacher s style of leadership, which encouraged teacher-led innovation including ICT applications, allowed teachers to develop a system suited to their needs.

- *My role is to initiate. I want individuals to participate as managers and teachers in turning principles to action. I have set up key stage committees to share management tasks and a resources committee to manage financial commitments for resources. If individual teachers understand finances they make more realistic demands for resources for curriculum delivery* (headteacher).

- *The system has been organic* (teacher). *It began as a way to computate students choosing subjects. It came from a dialogue* [between senior staff and teachers] *supplemented with changes in technology* (teacher).

1. The teachers used paper-based records as well as the computer-based records.

1. ICT was seen as a tool for teachers to use as appropriate: *The school has a culture where ICT is the norm* (teacher).

1. ***Summary***

The evidence supported the rival hypothesis that ICT was not the catalyst for change but was an additional resource supporting changes that were initiated by teachers. Procedures for monitoring pupil achievement at an individual level were of concern before software to manage this process was available. The evidence supports the hypothesis that the forces which drove the improvements (i.e. teachers desires to monitor students progress more closely) also drove the application of the technology to this specific educational problem.

1. **Hypothesis 2: Traditional diffusion patterns apply or is the diffusion pattern of ICT innovation different?**

The diffusion of the innovation/improvement (and therefore of ICT) followed the traditional diffusion pattern for innovations, as outlined by Rogers (1995). The rival hypothesis is that technology functions differently from traditional innovations and that therefore different diffusion patterns occur.

1. ***Evidence in support of hypothesis 2:***

1. Innovative teachers led development.

- *I pushed for improved resources some teachers took a lead....There are substantial numbers of individuals who innovate... Some do not recognise that they are innovators, they do a lot of work themselves using the technology. 5/140 staff are resisters* (headteacher).

- *The reflective teachers who were interested in the development of teaching and learning took to it*

first (teacher).

1. Once the clear value of the innovation was demonstrated, others adopted it.

- *Those who adopted it first were those with direct responsibility. It was those in disciplines who could see the use who ran with it. Within each department there are different levels of competence and use* (headteacher).
- *Teachers who are resistant to using it will use it when shown the relevance* (ICT coordinator). *One teacher who turned against the IT when it was started, kept loads of statistics on student s progress and began to see teachers knowing how to use the statistics using it better than him. He bought his own computer for home and started getting involved Other teachers were at different stages and needed guidance* (headteacher).

1. There seemed to be a number of reasons why individuals or departments resisted the innovation:

- *One department is resistant staff have been here a long time and are reluctant to drop the old system they have been using. One HoD doesn t have a computer in his office* [been here 30 years] *and there s another. It is not difficult in this school to have one if you want one* [i.e. a computer] (teacher).

- *Some were reluctant to use it because of lack of time and space...* (teacher).

- *But that goes back to the fear people had when computers were first introduced* (teacher).

- *We have got the classic technophobes who never use it because they do not understand it* (teacher).

1. ***Evidence in support of the rival hypothesis:***

1. This particular innovation necessitated training teachers to use the system. This requirement for training may affect the traditional diffusion pattern. Those with posts of responsibility were trained first:

- *I did training with heads of year so they were some of the first to use it to look up grades* (teacher).

- *We are targeting groups that needed to use it, we ve never had a full programme for all staff. It was only available to heads of year and heads of department and guidance staff when entering grades was first introduced. Other staff felt they would also like to do that. The plan was originally that the grades would be entered by administration staff, but staff liked entering their own grades for their own classes. They get involved and very enthusiastic about it* (teacher).

3. Some staff do not see the reform as relevant: *There are still staff who do not see it improving what they are doing. We need a catalyst to link subject expert and IT expert. Still teachers see it as a bolt on. Not speeding up or making work better* (teacher).
4. Lack of specific ICT skills may hamper some teachers in taking up the innovation: *ICT is time consuming, for example keyboard skills slow people up. It was not until I could type more quickly than I could write that I used the computer more. Lack of keyboard skills constrains people* (teacher).

1. ***Summary***

Overall the evidence supported the hypothesis that traditional patterns for the diffusion of innovation applied. However, there was some evidence to suggest that a skills deficit maybe an additional factor related to ICT innovation which hinders the diffusion of an innovation.

1. **Hypothesis 3: Staff ICT competence is critical or are infrastructure and student competence more important?**

Successful implementation of ICT depends mostly upon staff competence in the integration of ICT into instruction and learning. This hypothesis assumes that teachers mediate ICT applications when they are successful, and that ICT s academic value relates positively to teacher competence. This rival hypothesis is that the school technological infrastructure and student ICT competence rather than staff competence determine ICT implementation outcomes.

1. ***Evidence in support of hypothesis 3:***
2. Staff knowledge was critical to development:

- *I initiate a lot of things but the direction is informed by the teachers because they understand the potential use* (headteacher)

- *There is a drawback if using computers, for example when* [Teacher X, an early developer] *left no-one had the knowledge* (teacher).

2. ICT staff training has been a priority. *On going staff training was a high priority* (teacher). The school has used many strategies to train staff in-service training support for higher education courses, industrial society training, Government funded opportunities. *I have brought people on site to train and taken opportunities from hardware and software suppliers e.g. ICL. Phoenix also provide training...We discussed with the governors assisting teachers to buy their own computers. We bought laptops which teachers can borrow as well as PCs. Teachers would have had to pay tax if we provided PCs. Many teachers have bought their own machines* (headteacher).

3. The school had developed their system in spite of the limitations of the technology e.g. having to deal with at least four major computer system changes from BBC, Archimedes, Apple and PC. *We ve always been limited by hardware* (teacher). *The system was upgraded in September to respond to needs* (teacher).

1. Staff were driving demands for the system to be developed further, for access to be widened to staffrooms across the school and for teachers to gain access from home. *It would be wonderful if I could have access to the system at home. As I can only work on the system at school it means I have to take the information home on paper* (teacher).

1. ***Evidence in support of the rival hypothesis:***

1. Filemaker Pro was selected as the software as it could be used across platforms. This was essential as the school was still using a mixed platform of Apple Macs and PCs.

1. ***Summary:***

The data supported the hypothesis that teacher competence was a critical factor in the successful implementation of the ICT related reform, rather than student competence or technical infrastructure. Teachers needs placed demands on the infrastructure.

1. **Hypothesis 4: Is the gap between more and less advantaged students stable when ICT access is increased?**

Gaps in academic performance between high and low poverty students will not increase when all students have equal access to ICT. The rival hypothesis is that equal access to ICT will lead to more advantaged students increasing the performance gap with disadvantaged (high poverty) students.

NOTE: The school had two Open Learning Centres, one for Key Stage 3 and one for Key Stages 4 and 5, with considerable banks of computers connected to the internet which were available for student use out of school time.

Evidence in support of hypothesis 4:

1. Access to ICT at home was considered important by parents and teachers, with a very high percentage of students having PCs at home including internet access. *The majority of students have PCs at home 26/26, 39/40 in A level* (ICT co-ordinator). These percentages were similar in student groups lower down the school who took part in the research. *All except one parent had a computer at home with internet access* (teacher).

1. ***Evidence in support of the rival hypothesis:***

There was some evidence that students of different types use ICT for different purposes. The evidence presented in this area was strongly related to ability rather than background and is discussed below in the section relating to hypothesis 5.

1. ***Summary:***

The data supported the hypothesis that with equal access to ICT, gaps between the high and low poverty students would not increase. Students had high levels of access at school and home. Student background (i.e. advantaged or disadvantaged) was not cited as a critical factor influencing either student use of ICT or student achievement using ICT.

Hypothesis 5: With improved ICT academic standards will stay the same or increase or decrease?

Successful implementation of ICT will lead to the same or higher academic standards in spite of the low quality of many ICT materials. Academic standards are a function of teacher and school expectations and not of the standards of textbooks, ICT materials, and the like. The alternative hypothesis is that ICT use will lead to a lowering of academic standards as students spend more time on marginally beneficial searches and in browsing poor quality Web and courseware content.

1. ***Evidence in support of hypothesis 5:***

- Teachers considered a strength of the system was that it provided them with data which enabled them to focus on the individual student s progress and targets.

- *If students are aware* [of their personal progress] *it will make them more conscious that staff know what they are doing. It is a big school so it is good* [for students] *to feel recognized as individuals* (ICT co-ordinator).

- *Those students who are not successful are seen with their parents and head of year and put on a separate appraisal system (this involves setting short term targets so it is more manageable for the student - parents are asked to sign document to confirm that child has been working on targets). The period of appraisal varies, can be anything from 2 weeks to 2 months. Other students may be identified who are under-performing but parents do not need to be involved* (teacher).

- *I discuss the data outcomes with my students because I have the data...I tell them I know their profile and that I expect more. We discuss expectations. You can pick out anomalies..., Some might find out these issues by discussion, others by looking at the data...- those who were predicted with D & E s were getting B s. Midway through Year 10 students with low NFER* [scores] *are getting high grades in technology* (teacher).

1. It was felt the ICT system contributed to the raising of achievement: [without ICT] a*ttainments would drop because we re not tracking our students* (teacher).

- *But low ability* [students] *are probably monitored more carefully so lower ability changes are probably tracked better (bottom 20% and sets 2/3/4). So that is 40-50 students per year that get intensive checking* (teacher).
- *Underachievers get most benefit because they are identified quicker. When I was head of year 11, I had to identify the borderline C/Ds that was very easy to do. I also had to scan for careers - who was likely to do GNVQ, A level that was easy* (teacher).

1. Teachers commented that generally student ICT use improved outcomes:

- *Motivation is increased due to high quality presentation. There is good discipline and other benefits* (teacher).

- *The students do ICT tasks because they want to rather than because they have been told to. It is not like learning off a blackboard* (teacher).

- *In art it* [use of ICT] *gives children more confidence because it means they can save their work and experiment with it unlike when doing paintings when they are scared to spoil it. There is a large amount of information on the web e.g. for an upcoming visit to the Tate they can do some research and find out about the paintings there. They have access to a wealth of information that was not available previously* (teacher).

- *There has been a shift in the quality of research and that has been brought into the quality of students assignments* (teacher).

4. It may break down fears of failure: [Use of ICT] *breaks down barriers of children who are scared to make a mistake. It is easier to delete work that is wrong. It is a fast resource. It takes less space than books* (teacher).

- *It helps low ability or intermediate children more. It is also a big boost for girls who because of their ethnic background and parental pressure could do with a boost.... good for low ability children especially because they do not have to worry about their presentation because its comes out neat from the computer. It also helps in their subjects and spelling* (teacher).

- *Boys can present better girls do better than boys generally but now boys can do better* [than they used to do]. *Boys do good work but used to have shabby presentation. The less able children are also helped because they have better presentation now* (teacher).

- *The students in the project can follow course materials via the intranet so for example new students starting in the second week just start at the beginning. None are held back and none are stuck because they missed a previous session* (teacher).

5. Teachers also felt that ICT freed up time and enabled them to work more efficiently: *It reduces paper work and makes our job easier, less time consuming* (teacher).

1. ***Evidence in support of the rival hypothesis:***

1. There was some concern that telling students their predicted grades may be demotivating***:*** *You have to be careful of demotivating the students as well. It can be quite difficult to convince them they can do a lot better than the predictors* (teacher).

1. A number of teachers commented that the ability to use ICT effectively did not appear to be linked with academic ability.

3. There was some concern about inappropriate usage of ICT resources.

- Half of the students in one Year 10 group agreed with the views that *students can end up wasting time printing stuff that they do not really need, computers are used too much and work can be done without them; they could look through a book instead; you end up not taking as much time over your work if you use a computer, you do not learn as much* (Year 10 student).

- *Because youngsters are printing out neater things they automatically assume that the work is good* (teacher).

1. ***Summary***

The evidence supported the hypothesis that successful implementation of ICT leads to the same or higher academic standards. There was a small amount of evidence that some time is wasted by students who are unable to deal with the amount information obtainable from the internet.

6. PROJECTION TO THE FUTURE

All members of staff at Highgrove High who were interviewed commented on how useful the student data tracking system was in various aspects of their work and that it should definitely remain, and gradually be extended and improved to allow greater access and flexibility. There were a few areas, however, that were mentioned as issues that were to be addressed in the future.

The first of these was access to computers enabling staff to enter the relevant data onto the tracking system. The heads of year/key stage have their own computers, but the subject teachers often had to use the machines in the communal areas. In addition, a few teachers reported that the machines were slow when using the database, so they sometimes felt that it was quicker to use paper-based records. The school intended to supply all staff with computers within the next financial year.

A number of other factors contributed to the sustainability of the tracking system. Consistent application and development had meant that it was embedded within the broader teaching culture, and supported by teachers who shared in its benefits for teaching. However, to ensure full use of the data, staff suggested that initial and ongoing staff training needed to be addressed on a whole school level, beginning with the heads of departments and heads of year so that the system access was extended gradually allowing every teacher to input their own data onto the system. This training would ensure that all members of staff were not only aware of the advantages of the system, but also capable of using the resource as part of their teaching programme.
Another current problem that teachers were keen to overcome was that of having two different systems running concurrently, one on PCs, the other on old Apple Macs. Many teachers felt that the system could provide extremely useful data, but that all the data needed to be on one system to make it more accessible. As one teacher commented:

I have just reported on my Year 11 exam reports. In the report I have presented a profile on each student...their grade, the breakdown of their course work and their exam mark, their expected and predicted grade. Then mid-term Year 11 results and their end of Year 10 assessment. If there were time I would have gone further back, but I had to stitch that together from different files...The next stage is connecting it all together.

The planned replacement of existing Apple Macs with PCs will simplify teachers use of the system.

1. **APPENDICES**

APPENDIX A: METHODOLOGY

1. **Contact period**

First contact was made with the school, in the form of a site visit, on 15th September 2000, followed by a draft itinerary being sent to the school. The actual data collection took place between 6th and 10th November 2000, totalling five school days with two researchers.

1. **Data collection**

The following itinerary documents the data collection for the OECD study for the five days in school.

		Data collection
Mon	am	Arrangements with headteacher Interview with the headteacher (1)
	pm	Interview with the headteacher (2)

Tues	am	Interview with the headteacher of ICT (1)
	pm	Focus group interview with students (lower school)
Wed	am	Interview with the headteacher of ICT (2)
	pm	Focus group interview with students (upper school)
Thurs	am	Interview with ICT coordinator (1)
	pm	Interview with LEA adviser Interview with parents
Fri	am	Interview with ICT coordinator (2)
	pm	Debrief

Key

ICT Information Communications Technology
LEA Local Education Authority
( ) Number used when interview spanned more than one session

Notes

1. All interviews were of approx. 1-2 hour unless otherwise stated.
2. All classroom observations were of a typical lesson (approx. 60-75 mins)

3. Organisation of the data collection
Two researchers were present for all interviews and observations. During interviews, one researcher conducted the interview and the other took notes. All interviews were also recorded using audio tape.

APPENDIX B: ICT PRACTICE SURVEY FOR TEACHERS

Q 1.How comfortable are you with using a computer to do each of the following?

Task	Very comfortable	Comfortable	Somewhat comfortable	Not at all comfortable
Write a paper	7	5	1	1
Search for information on the WWW	6	6	2	0
Create and maintain web pages	1	0	4	9
Develop and use a data base	1	5	6	2
Send/receive e-mail	8	0	6	2
Programming	0	0	0	14
Draw a picture of diagram	4	2	7	1

n = 14

Q 8. On average, how often do your students do the following for the work you assign?

Task	Almost everyday	A few times a week	Between once a week and once a month
Use a computer for any purpose	0	11	3
Use of WWW	0	2	6
Create web pages	0	0	0
Send or receive an e-mail	0	0	0
Use a word processing program	0	6	7
Use a computer to play games	0	4	5
Use a spreadsheet	0	0	4
Use a graphics program	0	2	5
Join in an on-line forum or chat room	0	0	0
Use a graphing calculator	0	0	0
Use a digital camera	0	0	0
Use an instructional program	0	1	5

n = 14

Q 20. How would you rate your ability to use a computer?

Rating	Number
Excellent	2
Good	6
Fair	6
Poor	0

n = 14

Q 21. Are students computer skills ever assessed formally?

Response	Number
Yes	9
No	5

n = 14

Q 22. If you assign World Wide Web searching, how much freedom do you allow students in locating sites to visit?

Response	Number
No restrictions	1
Some restrictions	3
Designated sites only	10

n = 14

Q 23. Do any of the classes you teach have a web page?

Response	Number
Yes	0
No	14

n = 14

Q 24. What proportion of the computer use in your class is directly related to the course content?

Response	Number
All	4
Most	10
Some	0
Very little	0

n = 14

Q 25. What proportion of the computer use that you assign is done by students individually?

Response	Number
All	2

Most	5
Some	5
Very little	2

n = 14

Q 26. How often do you use a computer at home for preparing teaching?

Response	Number
Almost everyday	0
Several times a week	5
Once a week	7
Rarely	2

n = 14

Q 27. Have you ever participated as a student or instructor in a virtual course through the Internet/World Wide Web?

Response	Number
Yes	1
No	13

n = 14

Q 28. Have you ever participated as a student in collaborative learning over the internet/WWW with students from other classes?

Response	Number
Yes	0
No	13

n = 14

Q 29. Do you participate in any on-line professional chat rooms, forums, or the like?

Response	Number
Yes	1
No	12
Missing	1

n = 14

Q 30. How many e-mail messages do you send and receive each day?

Response	Number
None	6
1-5	7
6-11	1
More than 12	0

n = 14

Q 31. Have you ever done any of the following?

Task	Yes	No
Made changes to a computers memory chips, hard disk or processor	1	13
Installed an update to an application programme	3	11
Installed a computer on a network	1	13
Created or managed a web site	1	13
Developed a database with more than 25 records	2	12

n = 14

APPENDIX C: DOCUMENTATION

1. Documents
Documents collected from the school, and used in the preparation of this report included:

- Information and sample data on NFER CAT scores
- Examples of students records
- Information given to students on use of computers
- Copy of bid for schools 2001 ICT Infrastructure and PC replacement plans
- Examples of database materials
- Overview of new school database PowerPoint presentation
- Information on the Advanced VCE Information Technology course

2. School OFSTED report main findings
The following is an extract from a document reporting the main findings produced by the Office for Standards in Education (OFSTED) following an inspection of Highgrove High School in May 1998. Inspection reports are available from the OFSTED web site (www.ofsted.gov.uk).
Highgrove High School is a very effective school which achieves high standards in all that it does. The good quality of teaching, the high standards achieved by pupils and the sensitive leadership produce a vibrant and happy school that provides good value for money.

The school s provision is very effective in promoting pupils learning, their respect for others and belief in themselves, and a sense of their place in society. The curriculum is a particular strength of the school. The rich, broad and exciting experience it gives to pupils makes a very strong contribution to pupils achievement.

The inspirational leadership and effective management make a very powerful contribution to the school s positive climate for learning, high standards, rich curriculum and excellent relationships.

APPENDIX D: Extract from the Nomination Form for Highgrove High School

B. Basic site description

1. *Type of site (age levels/grades, public/private, special populations or services):*

11-18 years (Year 7 - Year 13). State maintained (Foundation)

1. *Location of site (urban, inner-urban, suburban, small town, rural):*

Inner-urban

1. *Socio-economic status of parents (describe indicator used):*

75% students have English as a second language, 20% free school meals

1. *Number of students plus notes on any imbalances in representation by gender or citizenship:*

1921 Citizenship: almost 100% UK. Ethnic South Asian - more than 50 %

1. *Percentage of students moving to another school before the end of the academic term:*

Very low percentage

1. *Total site budget:*

1. *Percentage of budget (approximately) spent on ICT:*

1. *Sources of income:*

Lettings e.g., Local Operatic Society, Sports Hall, Gymnasium turnover £100,000

1. *Other significant resources received in the past two years (volunteers, corporate donations, etc.):*

1) Grant for Grant Maintained schools 2) matched funding for Science and CDT from government £250,000.
3) Standards fund £50,000 Year 1, £70,000 Year 2 4) Business deal with caterers 50% share to redevelop catering facilities.

C. Staff

1. *Name, title, phone, and e-mail address of lead administrator:*

Confidential

1. *Number of staff:*

140 teaching and support staff

1. *Percentage of staff who do not complete the full academic year:*

Very low percentage

1. *Average number of hours spent teaching for teachers whose primary assignment is classroom teaching:*

18 out of 20 periods (each period 75 minutes in length)

D. Academic schedule and performance

1. *Academic schedule (start/end dates, weekly days/hours):*

September July; 20 periods per week, 75 minutes each.

1. *Organisation of instruction (timetable type, special educational needs provisions, etc.):*

2 weekly timetable slots of 75 mins (20 periods/week)

1. *Formal assessment procedures (types of tests, dates given, purposes):*

GCSE 16+ A level, NFER CATS Year 7, Year 9. Key Stage 3 SATs. Examinations take place in the summer term or at the end of modules of work

E. Improvement/Innovation

1. *Description of improvements or innovations (400-500 words--please attach, along with relevant documentation).*

See main report

1. *Main indicators of success of the improvements:*

Children and parents find the systems encouraged students to set higher goals.

1. *Role of information and communication technologies (ICT) in improvements (400-500 words please attach).*

See main report

F. ICT

1. *Brief description of the main technologies (ICT) used at the site:*

www; intranet. Student access is encouraged through the Open Learning Centres

1. *Total number of WWW-usable computers*

Limit because of band with and supervision. 200 - mostly Pentiums

1. *Total number of other computers*

150 networked non internet; 10 non networked mostly Pentiums; 20 Macs from administration not www. (Technical support from web: Novell support is good on-line.)

1. *Locations of computers (labs, classrooms, library, etc.)*

Library, labs, classrooms, dedicated suites

1. *Type of Internet connection*

Leased line. 512KB moving to 2MB next year.

1. *IT Pupil Code of Practice*

There was an agreed code of practice about the use of internet and email. Monitoring of websites accessed was undertaken by technical staff. Individual users could be identified. In addition filtering software was used and student use of computer suites and computers in the Open Learning Centres was monitored by staff.

1. *Examples of the layout of the computer suites (in the Open Learning Centres computers were clustered in groups.)*

Room 1: 30 networked computers available for pupil use outside lesson times.

Room 2: 30 networked computers available for pupil use outside lesson times.

The research described in this report was funded by the Department for Education and Employment.

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[1] In order to preserve the anonymity of the school and staff, this is a pseudonym.