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Young learners' reflections working within a rich e-learning environment

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E-learning: It isn't delivering knowledge, it isn't building 'teaching machines', it isn't edutainment, it isn't doing what we did before but cheaper. But it is the opportunity for children to explore new expertise, take new risks, develop new collaborations, gain new understandings… It is about creativity not productivity. As we've seen in so many projects at Ultralab it is also about ***multiple media*** *and* ***multiple learning styles*** *together with the opportunity to change the mix to suit the context, the learners, their predispositions and their entitlements. (Heppell, 2002)*

ABSTRACT

E-learning is a word of the moment in the world of education. It has as its basis an immense variety of technologies and techniques. There are almost as many views on the place of ICT in underpinning teaching and learning as there are educational professionals. Such views are wide ranging: from enthusiastically optimistically to almost pathologically negative. But what of the views of the 'clients'? The students themselves?

This small scale study, set in the context of Chafford Hundred Campus – a new, technologically rich school with a highly innovative, personalised and integrated curriculum, has engaged students in discussing many issues surrounding e-learning. For example, learners reflected on the present and future roles of teachers in an e-classroom and the potential for collaboration and research-based learning.

The outcomes of this article clearly demonstrate that students in Year 8 at the Campus approach their 'connected' school with a mixture of both excitement and trepidation. They are motivated, inspired and engaged by their learning environments. They value the inputs of their teachers and wish to see their roles change, rather than be eroded by the emerging technologies for learning. They see value in a goal of working alongside teachers and learning support tutors, face to face as both their mentors and as fellow learners. They perhaps, comprehend the concept of the 'lead learner' more clearly that do we.

INTRODUCTION: AIMS, INSTITUTIONAL CONTEXT AND KEY ISSUES

Aims

This article concerns the growth of e-learning in schools. It looks at the changing roles of teachers and their relationships with their students. And, it concerns itself with the part that e-learning might have to play in addressing the broader pedagogical issues surrounding personalisation of learning. In particular, it sets out to explore some early perceptions of a new generation of young e-learners having experienced a rich and pervasive e-learning environment for 18 months.

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Stephen Heppell's above quote in respect of a definition of e-learning, whilst hard hitting, could be viewed as very encouraging when set in the context of an often highly cynical mind set that many in the teaching profession would appear to hold with regard to the so called e-learning 'revolution'. This paper serves to explore Secondary age students' perspectives on e-learning and is set very much in the context of the rather unique learning organisation within which the research is carried out. As a consequence, the research findings themselves may be limited in their generalisability. Nevertheless, as the literature review will indicate, the views of learners with respect to these highly relevant issues are rarely sought. In this respect, this small scale study adds value to the various debates.

Institutional Context

Location:

The context for this paper is that of Chafford Hundred Campus, Business and Enterprise College[1]. The Campus opened in September 2001 with its first intake of Year 7 students and the full range of nursery and primary-age students, drawn mainly from the immediate vicinity. The term 'Campus' alone signals its uniqueness as an institution: it brings together under one roof a nursery, a primary school, a secondary, adult education, a public library and facilities for the community at large. The Campus sits at the heart of a new, large and growing, private housing estate. Upon opening, the campus attracted national acclaim and we believe it will be the model for many to follow. Indeed, in respect of researching both school buildings and curricula of the future, it is already much frequented by project management teams for the new wave of academies.

Connectivity:

On the school-wide wireless network with very high bandwidth, microwave broadband internet access, teachers and students are able to enjoy the ultimate in e-connectivity. Students, teachers and Learning Support Tutors use laptop, handheld and desktop computers. There are now 800 students and teachers working with over 900 such connected devices. By default, therefore, learners are immersed in technology. However, the primary focus for curriculum planning and delivery at The Campus is very much concerned with 'learning to learn' alongside exploring approaches to personalising individual and collaborative learning. An in-house/commercial co-developed Managed Learning Environment (Connetix ™) provides both the e-learning platform and home e-portal to underpin this high level of connectivity and enhance opportunities for personalisation of learning.

Multi-sensory, integrated curriculum:

The Campus's core values on curriculum planning and delivery illustrate the firmly held belief that learning is potentially significantly enhanced by our seriously addressing issues of multiple intelligences, student preferred learning styles and post-learning learner reflection. To manifest these values, The Campus places multi-sensory and accelerated learning principles at the heart of its practice. Gardner (1993) identified seven autonomous intelligences. These are:

- bodily-kinaesthetic (gymnasts and dancers);
- musical (composers, performers);
- **linguistic** (poets, writers);

- **logico-mathematical** (scientists, mathematicians);
- spatial (architects, artists);
- interpersonal (skilled negotiators); and
- intrapersonal (mystics).

Gardner suggested that schools tend to focus largely on two of these areas (emboldened) and that this increases levels of disaffection in those children who do not excel in these areas. He suggests that schools should address the other five through a multi-sensory, brain-based model of learning. The Campus proactively responds to such a notion both in its curriculum planning and delivery.

To reinforce links in learning and to provide a more seamless Key Stage 2 – Key Stage 3 phase transition, The Campus adopts a curriculum model which is integrated where, for students aged 11 – 14, one 'Home Teacher' delivers much of the competence and key skills underpinned curriculum. In the integrated curriculum, learners work through extended project themes such as 'Japan', 'Conflict and Resolution' etc. and from these, there emerge clear and relevant learning outcomes in literacy, humanities, technology, numeracy, citizenship, science, PHSE and creative art. Such learning outcomes are both teacher-planned and learner-driven. Teachers and students are encouraged to adapt learning to individual students' own preferred learning styles, brought to light by the use of learning styles inventories. Planning for learning is then supported by the intelligent use of the pervasive and immersive platform of e-learning technology.

Pedagogical framework for The Campus:

One useful *framework* for describing the emerging model of learning provision at The Campus is that illustrated by Askew and Carnell (1998): functionalist, client-centred, liberatory and social justice. In this framework, summarised in the Literature Review below, The Campus delivers very much to the intrinsic model – client-centred and liberatory insofar as it works primarily to:

- bring about individual change as a prerequisite for change in society;
- facilitate interpersonal relationships;
- provide a curriculum based on developing skills of self-reflection and analysis of experiences;
- develop individual potential;
- develop commitment to social and cultural norms through shared understanding of social values; and
- provide a curriculum based on perceived needs and ability level of the individual.

To support the implementation of these models, learners' and teachers' *constant* access to the internet, applications, software environments, their own networked files via handheld, laptop and desktop devices is taken for granted. Technology is *everywhere*, yet it is paradoxically and appropriately, *not* the first thing that is noticed in classrooms; that would most often be the high quality of interpersonal relationships and collaborative learning. This model is intentional. 'Invisible in ICT; excellence in e-learning' is one of the slogans of The Campus. The framework of transformatory learning by Askew and Carnell, which underpins our thinking, is outlined below in the Literature Review.

KS4 internships:

From 14-16 the move is away from the integrated curriculum towards a greater curriculum personalisation alongside an extended work-related model – the "Internship Programme". In this, students spend one day per week on a termly cycle of work placements. E-learning and e-administration, through Management Information Systems and both Managed and Virtual Learning Environments, puts technology in its proper place in the support of learning.

To support both Key Stages, in respect of our technology infrastructure, the intention is to provide for *maximum connectivity*. The notion being that the provision of electronic anywhere, anytime connectivity, learning and support are a *right* of the learner at the start of the 21st century and can no longer be considered a privilege.

Key Issues

After only eighteen months of such innovative work, during early 2003, it was determined that it would be interesting to ask whether the realities were borne out from working within such an environment – realities beyond the rhetoric. And most significantly, how the students viewed their access to technology, the changing roles of and their own relationships with teachers, the manner in which learning is delivered, its impact on motivation, learning outcomes, achievement and attainment.

The two questions upon which this paper will reflect are, in essence:

a) What is the impact of the provision of a rich, pervasive e-learning environment on the learning experiences of a Year 8 group?
b) What are students' early perceptions of this mode of learning?

LITERATURE REVIEW

Overview

At the turn of the millennium the government of the United Kingdom provided huge financial resources as they inaugurated an electronic portal for primary and secondary education – the National Grid for Learning (NGfL). As Reynolds et al (2003) state: "From 1998-2002, £900 million were allocated to connect schools to the National Grid for Learning and provide related staff development to ensure that the connection was effective." Nichol and Watson elaborate on the vision: "The NGfl was prophetic, embracing a vision of the future that united politicians, theorists, bureaucrats, ICT experts, commercial and industrial interests, the media and – through them – the general public." Also, that "… there was a widespread faith across the Anglo-Saxon industrialised world that ICT would be the educational catalyst which would transform society in the post-industrial age to match the perceived challenge, even threat, from the tiger economies of the Pacific rim" (Nichol and Watson, 2003).

Clearly much was, and remains, at stake, not just for schools but for society as a whole. But in the relentless drive to move e-learning to the top of the agenda for education, the wider issues of what makes for highly effective e-learning pedagogy and the multi-faceted needs of the child-learner in particular appear to be either ignored or at best, paid lip service to.

As an example of this, Guile argues that teaching with ICT is not suited to the traditional pedagogical styles where teachers are "solely managers and didactic teachers" (Guile,

1998). Others are quite clear about the key principles for the way in which computer technology is used in schools, for example Bain: "…four principles are paramount. These are: that technology serves teaching and learning; students and staff need ready access; technology must be embedded and integrated in the curriculum; and staff require training." (Bain, 1996 quoted in Dimmock, 2000).

In 1998, Askew and Carnell published a book which set out to promote a radical new approach to learning which they called the 'transformatory approach'. The authors deem such an approach as being appropriate given the current movement towards post-industrial globalization and a knowledge-information economy. Transformatory learning is "about participating in the whole experience of learning". It "focuses on the learner, the learning context and the learning process" (Askew and Carnell, 1998). Transformatory learning emphasizes interrelationships between emotional, social, spiritual and cognitive aspects of learning, on learning as an activity, rather than blocks of things learned and with individuals taking responsibility for their own learning. Such a progressive framework for learning reflects the core values of The Campus and in particular the fundamental reasons that underpin our ICT provision and e-learning implementation strategies.

An optimistic view

The approach to the use of technology in support of highly effective learning by students at The Campus reflects the above as from implementation we shunned the more traditional 'drill and practice' model that still characterises that vast majority of schools in the UK. There are many advocates for placing students in a rich technological framework to allow a more open and research-based model of learning, At The Campus, we believe that this offers the greatest opportunity for students to work more intelligently and more freely within at least four of the classical seven models of information processing as summarised by Joyce et al (1997), notably:

- **inductive thinking** – particularly in the development of classification skills;
- **scientific inquiry** – particularly in learning the research system and how knowledge is produced and organised;
- **inquiry training** – understanding how to collect information, build concepts and build and test hypotheses; and
- **use of advance organizers** – increasing the ability to absorb information and organise it.

Given the above presupposition, that learners, supported by intelligently implemented, rich e-learning will become more autonomous in their learning, it follows that knowledge construction through supported self study is the key. I believe that teachers are, at least potentially, liberated, both by the technology and the approach. As lead learners and liberated learning facilitators, they are able, as appropriate, to fully engage 'student-researchers' in their development of higher order thinking skills of analysis, synthesis and evaluation in particular and within this, valuable sub-skills such as classification and discrimination of information. From an optimistic standpoint, the potential of technology, used skilfully in this way, to develop a generation of young people with the real skills of self and collaboratively empowered learning could take us way beyond the current rhetoric of the 'lifelong learner'. Furthermore, at the Campus, we believe that technology, in the hands of a reflective practitioner, far from being something that discourages collaboration and social development, through group work in the planning, development and plenary stages as well as through online discussion (synchronous and asynchronous), can lead to an emphasis on work within a number of models in the social family of models as laid out by Joyce et al (1997):

- **group investigation** – developing skills for participation in democratic processes. For example when different members of a group are required to research different parts of a project before bringing them together;
- **social inquiry** – social problem solving through collective academic study and logical reasoning;
- **positive interdependence**; and
- **structured social inquiry**.

In respect of the learning outcomes of students, as measured by quantitative attainment, it begins to emerge that ICT may have a positive impact on achievement for **some** students in **some** contexts. A recent DfES report suggests that "schools that were judged by OfSTED to have very good ICT resources had better achievement than schools with poor ICT" (DfES, 2002). The Campus itself is too young and lacking in public examination data, we remain unable to validly and quantitatively measure the impact of immersive e-learning environments on attainment outcomes. The impact of e-learning, within the context of our curricula will be evaluated after two full years of public examination results, in the Autumn of 2007.

A less optimistic view

Others, internationally, are less optimistic. A report by the Alliance for Childhood in the USA illustrates this (Cordes and Miller, 2000). It argues that parents and teachers are "distracted from the provision of children's basic needs – contact with other human beings and the natural world around them, space to grow and develop and time to be children" and that there is a "pressure to introduce them to technology: they impose the adult mode of seated, intellectually orientated approaches such as internet research."

Thus, the literature is awash with claims and counter claims from the optimist rhetoric of the apparently indisputably standards-raising ICT implementations which "increase the intensity of students' learning" (Moseley and Higgins, 1999) through to the more pessimistic rhetoric that "ICT in the curriculum has been broken-backed without a pedagogic spine to provide the necessary structure and support" (Reynolds, Treharne and Tripp, 2003).

Onto more specific implementations, such as learners' increasing access to the internet, there are also conflicting and contentious claims. Selwyn (1999), for example, claims that "the benefits of instant access to raw data from around the world are obvious, but other learning experiences are not so temporally and spatially reducible." And that, paradoxically, the internet "…expands and restricts the learner's worldview, both in terms of their values and sensibilities about time and events of culture".

Fierce Debate

It is clear from the above and through the many quotes that follow that the multi-faceted, e-learning debate is fierce and in part being played out on the 'front line', within the staffrooms of the nation's schools and colleges. Nationwide, teachers only recently completed their entitlement to basic skills New Opportunities Fund ICT training and are receiving their certificates against a backdrop of mixed criticism of the programme.

A great deal of feedback has been and continues to be received from teachers, operating pilots and working in schools at the leading edge of e-learning. Little, however, has been heard from the students at the 'receiving end' of this 'learning revolution'. This small scale study plays a part in redressing this imbalance and whilst addressing some of the above mentioned issues of metacognition, learning outcomes, achievement and attainment, it will focus most sharply on three key issues in this unique context at The Campus:

- the motivation of learners;
- the appropriateness and relevance of the use of ICT; and
- the roles and behaviour of teachers.

Framework for the analysis of data

In 2000, Dimmock summarized Hancock (1997) in his synthesis of the six key attributes that the 'Information Age' school might follow: these being interactivity, self-initiated learning, a change in the teacher's role, media and technology specialists as central participants, continuous evaluation, and a discussion-centred classroom environment. Given that all six of these attributes are highly representative of the core learning values of The Campus, it was from the outset, highly likely that they would be chosen to form the framework against which the analysis of data would be carried out. In the event, the first five of these were chosen (the discussion-centred classroom environment attribute was less appropriate for this particular study, particularly at the stage of e-learning development that The Campus was at, at this time). These attributes are summarized below (Dimmock, 2000):

1. **Interactivity**: students are highly interactive, communicating with other students through formal presentations, cooperative learning activities and informal dialogue. Students and teachers talk to one another about learning tasks in large groups, in small groups and in one to one.
2. **Self Initiated Learning**: students take charge of their own learning. They, rather than the teacher, ask the initial questions. They gather their own data rather than the teacher transmit or prescribe it; they analyse, interpret and synthesize the data in the context of the problem. They experience the higher order skills involved in the process of learning.
3. **A changing role for teachers:** .... from director to coach and facilitator. Information is obtained by the students from the computer and not from the teacher. Teachers stimulate and prompt the students to ask the right questions and set about solving them.
4. **Media and technology specialists as central participants**: they work with students to prompt the right questions and to guide in the availability of information resources. With teachers, they are instructional designers, developing curricula and helping to plan units.
5. **Continuous evaluation:** teachers and schools engage in ongoing evaluation of the materials they use and those which are available. They collaborate in software development and exchange information about new products

RESEARCH AIMS, METHODOLOGY AND RATIONALE

At the time of the research being carried out Chafford Hundred Campus was a relatively new establishment with only Years 7 and 8 in the Secondary wing. It has as part of its vision, a highly innovative and flexible curriculum which is planned to be underpinned by a pervasive and seamless use of wireless, networked and internet connected technologies.

The curriculum and access to that curriculum is led by the learning needs and aspirations of learners. A web-based Managed Learning Environment (MLE) is being developed alongside a London based programming company Connetix ™[2] to facilitate this flexibility. The image conjured up by the vision is one where teachers work alongside learning support tutors and other experts, to facilitate students' largely independent, e-learning.

Year 8 had then worked in this evolving structure with their 1:1 wireless laptop provision for nearly two years. The intention of this research was to engage a cross-section of this year group in a dialogue concerning their learning experiences, the impact of the available technology and their views on this movement and the possible consequences for teachers and learners, now and into the future. The whole year group was briefed in assembly and an enthusiastic, mixed ability Year 8 group was chosen as a sample.

The aim was to endeavour to start collecting data that reflected the views of young people at the leading edge of e-learning innovation and to summarise those views qualitatively. Research philosophy and strategy were to be interpretive and ethnographic in nature. Focussing on students' views and values through reflective dialogue did not lend itself to a quantitative methodology, particularly given the small sample. Data were collected in two ways. The first instrument was based on an asynchronous online discussion forum. This was set up via a password protected web page via my own website. The password protection and the asynchronicity of the instrument offered security on an otherwise public network. This formed part of the consideration given to research ethics in this study.

Ethics: Permissions and Anonymity

The permission of the Head of The Campus was sought and given for the research to proceed. All involved were told that their responses, be they in online discussion or face to face interview, would remain anonymous and that once the data were analysed and published, all original data, electronic and hard copy, would be destroyed.

Issues for Discussion on the Online Forum

Following agreement to begin, a brief pilot with three students, selected from volunteers by drawing straws, five 'issues for discussion' were compiled on an online discussion forum by myself and trialled on the pilot group to ensure that they were suitably accessible to the target respondents. They were written to address the three key issues underpinning these studies; notably

- the motivation and learning behaviours of learners as influenced by pervasive access to ICT for learning;
- the appropriateness and relevance of the use of ICT; and
- the changing roles and behaviour of teachers in such a context.

Once the pilot had been completed satisfactorily, the discussion forum was opened up to three mixed ability Year 8 classes. Students who had played a part in constructing these issues were encouraged to contribute a response to them or, in turn, to respond to other students. Students made their contributions towards the end of their early entry GCSE ICT lessons:

The discussion forum, originally hosted at my own website http://www.mrbennison.com, was a single forum with five distinct discussion issues as outlined below:

Discussion Issue 1: "If you use your laptops in Campus, talk about some of the different ways that you have used them. What do you use them for?"

This was an "ice breaker" question, to encourage free and open-ended responses.

Discussion Issue 2: "Some people say that over the next 5 to 20 years, computers, excellent software, other ICT technology and the internet will take over ALL the jobs that teachers now do.
How do you feel about computers being used more and more in learning?
What about a school with no teachers – just computers and technicians"

This issue reflects the research question and many elements present in the literature review, in relation to putting learners at the heart of the learning process and providing technological support for that learning.

Discussion Issue 3: "Carry on this sentence with your own views ...
Don't worry about getting carried away, just say what you think...

"The good thing about LEARNING things by using computers and other technology is ..."

Discussion Issue 4: "The problem about LEARNING things by using computers and other technology is ...."

These two issues were intended to encourage students to reflect on pedagogy in relation to the use of technology and to note whether students found themselves generally in the 'optimistic' or 'pessimistic' camps as reflected in the Literature Review.

Discussion Issue 5: Some people say that forcing young people to work more and more from a computer screen means they spend less and less time working with and learning from each other. They also might spend less and less time working with and learning from teachers.

They say this is a problem that computers will lower standards in education and will lead to young people who cannot work with each other. They will lack team skills etc.

What do you really think about this negative idea? Do you agree? Explain your views.

This issue aimed to challenge (or otherwise) the notion that extensive use of technology for learning served as an impediment to collaborative and co-collaborative learning, as suggested by some commentators.

Students from the three groups contributed over a period of nearly three weeks with a purposefully minimal input from any adult. Then, following a reflective analysis of the students' responses, a small cohort of students were randomly selected from those who had contributed and asked if they were happy to take part in a one-to-one, semi structured interview to elaborate on some of the issues raised by everyone in the discussion forum.

Selection of the candidates and construction of the questions for interview

As indicated, a small cohort of five students were randomly selected from the top fifteen contributors (in terms of frequency of responses on the discussion forum) as those who

might be more inclined to elaborate upon their ideas in face to face, semi-structured interview.

The five students were interviewed for approximately 15 minutes each. Three questions were posed which were created following the analysis of the online responses. This general and qualitative analysis indicated that the core of responses suggested three main issues of concern and interest to the bulk of the respondents:

- the value placed upon the availability of ICT and its ability or otherwise to enhance the learning experience;
- the importance of being permanently connected to The Campus network/world wide web via ever-present laptop; and
- the changing roles of teachers in this context.

Initially, these questions were piloted with three students who **did not take part** in the online discussion prior to being slightly modified for clarity and accessibility. These questions were as follows:

Question 1: How important is ICT, here at the Campus, in helping you to learn? Compare for example the importance of your laptop and the importance of your teachers.

Question 2: What difference would it make to you, if we took your laptops away from you and gave you access to computers only when a piece of work required it?

Question 3: Do you see computers taking over more and more of the jobs carried out by teachers in the years ahead?

RESEARCH FINDINGS: FINDINGS, ANALYSIS AND DISCUSSION

In their responses to both the online discussion and the interviews, students indicated clearly that they were aware of a whole range of applications of technology in schools and that some of these applications, they felt, served their learning needs better than others.

As indicated in the Literature Review, Dimmock (2000) summarises Hancock (1997) in his synthesis of the six key attributes that the 'Information Age' school might follow. Looking at the data, these attributes offer a highly suitable framework within which to reflect on some of the responses of students in this study:

1. **Interactivity**: students are highly interactive, communicating with other students through formal presentations, cooperative learning activities and informal dialogue. Students and teachers talk to one another about learning tasks in large groups, in small groups and in one to one. (Dimmock, 2000)

In their own words, students in Year 8 at Chafford Hundred Campus reflected both in online discussion and during interview that this type of use was both highly motivating and probably under-used. Out of over 95 elicited responses, 15 reflected this attribute – 3, typical of these, are illustrated:

"It's good to give presentations with PowerPoint ™. Teaching a class like that is a good way to make sure you learn something well". – Student D (Online Discussion)

"We have made contact with other students in other schools. Even in other countries. But we should do this more. Learning about other cultures this way is much more interesting than from a book. You find that people all over the world have similar problems". – Student H (Online Discussion)

"I think we should do more of this [collaborative learning with technology] otherwise it can get a bit boring just sitting typing on a keyboard and staring at a screen". – Student 4 (Semi-Structured Interview)

2. **Self-initiated learning**: students take charge of their own learning. They, rather than the teacher, ask the initial questions. They gather their own data rather than the teacher transmit or prescribe it; they analyse, interpret and synthesize the data in the context of the problem. They experience the higher order skills involved in the process of learning. (Dimmock, 2000)

In their responses, the majority of students clearly valued the empowerment of having 1:1 access to a connected, wireless laptop but frequently reflected upon the lack of empowerment in their use of it. There were 22 responses that referred in this way to self-initiated learning in one form or another. Five are listed below.

"Some of the things we do, like Global Maths ™ is just like using a text book except it's on the computer and you find out if you were right. I quite like that but it can get boring" – Student C (Online Discussion)

"We do get the chance to research on the internet but most of the time we are told which websites to go to or you find a website that just has too much information on it. I get really bogged down sometimes" – Student 2 (Semi Structured Interview)

"I like it when we have a lot of freedom to use the laptop. Like when we are given a project to do. I had to find out about fossils in Science and do a PowerPoint on it for the class. It was difficult to know what information to use and to leave out. I tried not to just copy and paste. At the end it felt like I had done something myself. We should do more of it". – Student J (Online Discussion).

The students who were engaged in this particular study were, in general, yet to be convinced that the tools were being used to any great extent in a fully collaborative way.

"I do think that the laptops make us more independent and we don't get as many chances to work in groups anymore." – Student 1 (Semi Structured Interview)

"(Working with laptops makes me) … appreciate PE and Technology (Design Technology) more because that's when I get to work with my friends" – Student 4 (Semi Structured Interview)

If these responses, to both interview and online discussion, are considered to be representative then there are issues for the school in respect of the training of staff to not think about technology as leading exclusively to a screen-facing independent learning agenda.

3. **A changing role for teachers:** .... from director to coach and facilitator. Information is obtained by the students from the computer and not from the teacher. Teachers stimulate and prompt the students to ask the right questions and set about solving them. (Dimmock, 2000)

The questions both in the discussion and interview that generated most interest and the greatest consensus centred on both the current and future roles of teachers within the technology rich learning environment. Out of around 95 studied responses, there were 62 that reflected in some way on the changing role of teachers. Six are outlined below.

"Computers are good in schools because they are the future, they help children with learning as much as teachers and at the same time it is taking a step into the future." – Student K (Online Discussion)

"I think that to use laptops every now and then is okay, but not every day. Teachers have different strategies and that can help some people learn more easily. Laptops are the same each day." – Student B (Online Discussion)

"I don't think that computers are better at teaching than the actual teachers! You can not learn everything off the computer; if you did life would be very boring. Also, teachers are passing on their skills to us and computer can't do that." – Student L (Online Discussion)

In these and other responses, students were very concerned at the prospect of 'exchanging their teacher for technology'. Many students reflected on the relative poverty of a learning environment with only technology and technicians.

"No I think we should have teachers as well. Computers can't teach you everything. Teachers can pass on their own ***wisdom*** *which computers don't have." – Student L (Online Discussion)*

"Computers quickly become boring but a good teacher can keep you interested for hours and hours. They make sure that everyone takes part in the lesson" – Student 6 (Semi Structured Interview)

I felt that it was encouraging to read and hear the overwhelming majority of students who took part reflecting on just how much they valued a 'good teacher' and really could not envisage a school without teachers.

A few were confident enough to reflect that they would rather learn from a computer than from a bad teacher though*! '….especially in Maths' – Student 6 (Semi Structured Interview)*

4. **Media and technology specialists as central participants**: they work with students to prompt the right questions and to guide in the availability of information resources. With teachers, they are instructional designers, developing curricula and helping to plan units. (Dimmock, 2000)

Very few responses referred to the support of additional specialists in the design and delivery of e-learning at the campus although many had very clear ideas in relation to virtual learning and the opportunities to collaborate with others (including experts) in their learning, via electronic means. Three are outlined below.

"Discussion and chat groups are good but it's not the same as being in person. Our (Chafford Hundred Campus) virtual reality is a good place to meet though" – Student H (Online Discussion)

Student H was reflecting on the three dimensional, walk-around, virtual reality mock-up of the Chafford Hundred Campus. This was designed and created by a Year 8 student following a short series of lessons in the use of the software. A number of students reflected on such exciting times ahead where 'meeting people' in 'virtual space' would make learning from people all around the world more realistic. One student, during interview, took this idea a step further when exploring question 3:

"It would be great if it was like the Matrix ™, where you could step into and out of different (virtual) worlds. Teachers could create worlds like History or Science then take us there. We could learn like stepping back in time". Student 3 (Semi Structured Interview).

Although a little worrying, given the certification of the film to which the student referred, the answer was a good example of a student independently reflecting and projecting into the future and how the classical 'teacher' might just still be employable as a 'world creator' and 'virtual guide' in this brave new pedagogical world!

In a slightly more currently realistic reflection, as part of the discussion group, another student commented:

"I feel that the more the technology is involved in education, the more different types of learning students have at their fingertips. It also provides a more fun way of learning with online games and websites specific to the point of learning. Teachers might not have to be got rid of because perhaps they can provide the websites and maybe some teachers could make their own websites with all their learning plans and learning resources put online!" – Student C (Online Discussion)

5. **Continuous evaluation:** teachers and schools engage in ongoing evaluation of the materials they use and those which are available. They collaborate in software development and exchange information about new products. (Dimmock, 2000)

In 33 responses, both to discussion issues and during interview, there was a real sense from some students of the 'experimental' nature of the work in which they were involved at The Campus: that, teachers were using the hardware, the networks, the software and were developing and collaborating in the development of largely untested resources. Some students reflected this in an exciting way. Others expressed a level of concern. Some of these responses are illustrated below.

"I do feel like we are a bit like that (guinea pigs). You need to have a lot of trust that the teachers actually know what they are doing. It's not like a normal school" – Student 2 (Semi Structure Interview).

"It (the network) lets us down quite a lot. I have lost a lot of work. I think things need to be tested more before we are using them." – Student 4 (Semi Structured Interview)

"Its exciting being in a school with loads of technology. More than any other school. It means we can try things out before anyone else does" – Student 6 (Semi Structured Interview)

"With the power of this technology, teachers here are kind of learning with us and that is exciting." – Student 6 (Semi Structured Interview).

These last two points, made quite independently during one of the interviews, illustrate a student drawing conclusions that amount to that which permeates much of the recent literature on learning and the role of the teacher and the teacher's relationship with learners. As Delors (1996) notes: "Better still, school should impart both the desire for, and pleasure in, learning, the ability to learn how to learn and intellectual curiosity. One might even imagine a society in which each individual would be in turn both teacher and learner." (quoted in Askew and Carnell, 1998). The single Campus 'Home Teacher' of the integrated curriculum delivered with extensive application of e-learning, at Key Stage 3 very much exemplifies this notion.

It can be concluded, even from the relatively small sample of responses discussed above, that children really do think about their learning environments. They are acutely aware of the experimental nature of The Campus and particularly of the changing roles of teachers, learning support tutors and the use of the technology within which there has been huge investment. They have well formed views and are quite prepared to share them.

CONCLUSIONS AND REFLECTION

Teachers and learners on a learning curve

In 1990s, Denning (1995-7) reported that "ICT use can lead to increased commitment to the learning task, enhanced enjoyment and interest in learning, an enhanced sense of achievement in learning, an increase in self-directed learning and enhanced self-esteem". Many of the student responses quoted above reflect the general impression that students gave about their experiences which, in the main, suggests a very positive attitude to learning which was enhanced by the availability and a varied use of the technology.

Students were happy to discuss the various approaches and behaviours of teachers in the context of student-centred learning with ICT. Predominantly, students reported that they had faith in the evolving work of teachers although they acknowledged, in their own way, that much was experimental and that teachers were on a steep learning curve too.

That the "teacher is a crucial factor in the process of introducing ICT in the classroom" and that "the selection and use of software by teachers can have a significant impact on the learning environment" is undisputed. (Smeets and Mooij, 2001)

It is also interesting to reflect upon the impact of teachers' individual pedagogical perspectives. Again, the same authors explore and conclude this with rigour: "Teachers who adhere to traditional transmission approaches to instruction prefer skill-based software, whereas most teachers who support constructivist views of teaching and learning use skill-based as well as open-ended software." (Smeets and Mooij, 2001)

Given that teachers following schemes of work at Chafford Hundred Campus cannot escape using the technology that surrounds them, an indication that teachers with perhaps slightly differing pedagogical perspectives at The Campus might also have a preference for embracing certain types of software begins to emerge with students' responses to issue 1 in the discussion. It is clear that a relatively small number of teachers stop at the point of using their laptop and projector for delivery whilst occasionally having students produce their work on word processor (linear). At the other extreme, a number of teachers clearly

explore the full use of the resources available and with their students and their laptops, in particular make extensive use of the internet, of linear and non-linear, managed learning systems and linked technologies such as measuring probes, control, CADCAM and video conferencing.

With this in mind, it is my view that post New Opportunities Funding training now needs to properly engage teachers in going way beyond software and hardware and also merely beyond paying lip service to rationale and protocols. Teachers now need to consider fully the learning needs of individuals, metacognition and the type, range and scope of use of ICT within an overall learning package offered to students. Observations made by Pisapia (1994) indicate that

> in exemplary classrooms, teachers may use resources in different ways, such as drill and practice exercises, simulations, problem-solving activities and productivity tools. A characteristic of these classrooms is that student use of learning technologies is woven integrally into the patterns of teaching. Teacher-centred teachers, on the other hand tend to use traditional instructional methods and to regard learning technologies mainly as basic skill reinforcers, motivators, or 'special treats'.

Differentiation is an issue too. As Smeets and Mooij (2001) indicate, "ICT may not be expected to contribute to creating innovative, student-centred learning environments unless the teachers involved pay attention to the potential of ICT to facilitate curriculum differentiation." Once more, the responses of students to many of the questions and discussion issues explored here would suggest that at The Campus we have amongst our own staff colleagues who fit into both categories and also many who have not realised the potential of ICT to support the learning of those with exceptional learning needs. As a school we must face this as a challenge and throw open the doors to a more reflective approach to our collective use and planned use of educational technology. Within the context of our approach to a Key Stage 3 Integrated Curriculum, these ideas become even more relevant and potentially empowering.

The metacognitive angle and opportunities for further study

An initial area of interest that had turned out to be relatively unexplored in this small scale study is that of metacognition. A future study might explore with students and with teachers how those with differing preferred learning styles respond to networked learning resources. Given that much of the learning that takes place in the realm of technology-underpinned delivery is non-linear, this was considered to be an issue in a study of non-linear learning in hypermedia programmes by Chen (2002): "… non-linear learning is closely related to students' cognitive styles. Not all learners appreciate non-linear learning, particularly when taking into account their cognitive styles." A more optimistic view is expressed by Rasmussen and Davidson (1996): "One of the most powerful features of computer-aided instruction is its capacity to individualize instruction to meet the specific needs of the learner."

Chafford Hundred Campus is an exciting place within which to work. There is a real sense of working in a team of staff, alongside students and parents with a mission to innovate, not as an end in itself, but rather as a way to empower and to realise the 'holy grail' of the lifelong learning culture. This small scale study makes clear that as we continue to write on the many sheets of blank paper that lay in front of us, we must, more frequently turn to our fellow learners, our 'clients' the students for their views, their visions and their innovations.

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NOTES

[1] See http://www.thecampus.org.uk
[2] See http://www.connetix.co.uk