e-Learning

What it is, why it is important and how it will develop

A guide to E-learning for teachers, school senior leaders, curriculum and assessment planners and policy makers

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Contents

Executive Summary

- A descriptive definition of e-learning would be:
  '*E-learning occurs whenever ICT is used as the medium*'
- However, a definition that also asserts the effectiveness of e-learning is :
  'E-learning is learning that is enhanced through the effective use of new technologies'
- E-learning is important because the medium of ICT offers access to a greater range of source material, flexibility in how information is processed, enablement of the application of higher order thinking skills, and the means to design and create products constructed from information.
- A definition of e-teaching would be:
  '*E-teaching is teaching that supports learning where both make effective use of new technologies*'.
- The impact of the inspirational teacher on the motivation and determination of the learner is unlikely ever to be surpassed by an on-screen resource, now matter how well-produced.
- The relationship between ICT and e-learning could be expressed with the recognition that
  'Effective e-learners will possess a high level of ICT Capability'
- To be completely effective as a medium for learning, ICT will need to be as accessible as are current writing tools
- For many schools, the full benefits of e-learning will only be fully realised by a systemic change in the way that learning is organised.
- The e-confident learner will first and foremost be a good learner. In addition they will possess a range of skills associated with using ICT intelligently
- 'Learning' should be the number one subject in the curriculum of the School of the Future, a subject embracing the components of both meta-learning and e-confidence.
- The learning environment can be a limiting factor in applying the skills of e-learning
- Acceptance of risk-taking, and removal of the notion of 'failure', will support the development of e-confidence
- E-confidence sits with a range of learner outcomes that are valued by employers but which are not necessarily assessed by current examination methods
- Some of the lack of evidence of the impact of ICT in schools may be due to the fact that current assessment methods do not place sufficient value on the e-confident and effective learner competencies

- Changes to what is taught and how it is learnt need to reflected in assessment methods
- For many schools the full benefits of e-learning will only be fully realised by a systemic change in the way that learning is organised.
- There is currently scope for curriculum innovation that promotes the potential of e-learning
- Assessment needs to be reformed in order that the full range of outcomes to effective e-learning programmes can be measured
- The attributes associated with e-learning lie within a package of capabilities and personal qualities valued by employers, but not made explicit in the current Programmes of Study that describe the National Curriculum.
- There is scope for e-learning systems to seek to identify and capture a fuller profile of what a student knows, what they understand, and what skills competences and capabilities they have developed.
- Reforms to assessment practice should seek to, elevate the role of the teacher as a leader of learning, measure pupils' personal attributes and qualities as well as subject-related outcomes, be more integrated with individual learning activities, make use of the ability of digital technologies to measure and process a greater range of student performance information, and give rise to more enabled e-learning and e-teaching

Introduction

This paper arose out of a think tank event was organised jointly by the Qualifications and Curriculum Authority (QCA) and Naace, the Association for Advancing Education through the use of ICT.   Present at the event was an experienced group of specialists working in the field of ICT. Many areas of expertise in the ICT Education world were represented, including lead persons from the key national agencies (QCA, Becta, NCSL, Partnerships for Schools, SSAT), secondary, primary and 'beyond-school' education, the National Strategies, LEAs and independent consultants. The range of professional interest present covered school developments and ICT initiatives, staff development and school leadership, developments in curriculum and assessment and Building Schools for the Future.

Acknowledgements

The definition of e-learning and its scope.

What is the case that supports the development of e-learning?

The aim of the QCA Curriculum Futures initiative is to develop a world-class curriculum that will inspire all learners and prepare them for the future. The existing national curriculum provides freedom to innovate. Innovation stories were showing that there were emergent themes to curriculum design including content, skills, experiences, people, time, technology and community involvement. A 'Curriculum Design Standard' could form a blueprint by which separate school curriculum designs could be judged. The curriculum should give rise to successful learners, confident individuals and active and responsible citizens.

The successful development of e-confident learners would be a key to the delivery of the curriculum fit for the future. Definitions of e-learning could be essentially pragmatic. E-learning was not the same as e-teaching or e-training. A simple example comes from the DfES: *"If someone is learning in a way that uses information and communication technology (ICT), they are doing e-learning."* Importantly, ICT enables learning to take place outside of schools, at different times, and making use of different sources of learning (in addition to more formal learning arrangements offered by schools.)

In considering the nature of e-learning in emergent curriculum designs and developments one should be ambitious in one's thinking; "Don't limit a child to your own learning, for he was born in another time."

The term 'e-learning' is a relatively new one. A range of definitions of e-learning have been proposed each reflecting the relationship between education and technology. One type of definition (descriptive) simply recognised that e-learning occurs whenever new technology was used in circumstances recognisable as a learning activity. Another type of definition reflects how that use of technology improves the quality of the learning process itself (affective).

The terms 'ICT' and 'e-learning' are both in need of clarification before any discussion can set out in an agreed and meaningful direction. 'ICT' can refer to a group of technologies, most broadly characterised by use of a computer. 'ICT' can also refer to a subject of the curriculum which originally focussed on learning how to

program a computer, but in more recent times is more about how to use ICT in a way that develops 'ICT Capability' - or the capacity to use digital devices intelligently for a range of purposes.   ICT Capability is defined in the National Curriculum in terms of Knowledge, Skills and Understanding, with the aim that pupils will be able to 'use ICT securely, creatively and independently'. Hence, a definition of ICT Capability would be that *"ICT Capability is the capacity to apply technological knowledge, skills and understanding to any given problem".*

However, there is an overlap between an understanding of the term 'ICT' with 'e-learning' in the sense that learners will need to possess a high level of ICT Capability in order to make proficient use of e-learning technologies - such that their learning will be enhanced by this use.   Furthermore, their insight into ICT will provide them with new ways of learning, because the ICT tools that they will understand and use will give them new ways to construct and manipulate knowledge.   As such, the relationship between ICT and e-learning could be expressed with the recognition that *'Effective e-learners will possess a high level of ICT Capability'.*

> Question 1: When you use the terms 'ICT', 'ICT Capability' and 'E-learning' does your audience precisely understand what you are referring to?

The extent to which adding an 'e' to words like 'mail', 'learning', 'skills', 'assessment' and 'confident' gives rise to words with a new meaning needs to be an exercise in caution, but one not without its usefulness when this short adjunct acts as an aid to understanding.   The term 'e-learning' is a convenient way to recognise that learning could be enhanced through the medium of ICT, and that the phrases 'enhanced-learning', 'effective learning' and 'empowered learning' perhaps reflect this understanding better than 'electronic-learning'. The 'e-word' can also, with some justification, include 'enrich', 'extend' and 'empower'.

A consensus position on the meaning of this term would probably lie within our understanding of the special nature of the interaction between a learner and the technological tools that they use. Consequently, the potential definition that '*E-learning occurs whenever ICT is used as the medium for learning'* might not sufficiently recognise the empowering influence of ICT compared with '*E-learning is learning that is enhanced through the effective use of new technologies*'.

With this latter definition, the case to support the promotion of e-learning becomes self-obvious.

E-learning is more effective than learning without the use of ICT. At its most effective e-learning will be transformational.

> Question 2: Does your use of the term 'e-learning' always describe a way of learning that is more effective than learning without the use of ICT?
>
> Question 3: Does your implementation plan for e-learning aspire to promote learning that is transformational - and embody enhancement, enrichment, extension and empowerment, as well as 'electronic'?

In the Twenty First Century, learning needs to take advantage of technological developments and evolve in line with the needs of the country, to the role that education has to play in preparing learners for their contribution to society, and to their own self-fulfilment.

As such, e-learning will play a central role in consideration of how the School of the Future will organise learning. To be completely effective as a medium for learning, ICT will need to be as accessible as are current writing tools - which might be considered as an earlier and more ubiquitous form of ICT. As such, new technologies will need to be integral to the design of how education in the future will be organised. This is a much more far-reaching consideration than the construction of computer rooms. Personalised Learning based on e-learning methods will require personalised access to ICT. The more effective opportunities to learn, implicit in the notion of 'e-learning,' can be seen today in those schools that have been successful in making ICT readily available to learners, and have been prepared to make the changes to teaching, learning and organisation needed to maximise the potential for learning. For many schools the full benefits of e-learning will only be fully realised by a systemic change in the way that learning is organised. For e-learning carries with it a range of new learning modalities where a facilitator to that learning could be available in both on and off-screen contexts.

> Question 4: Do your plans for developing e-learning ensure that the tools of e-learning are accessible whenever the learner might benefit from access, wherever they happen to be?
>
> Question 5: Do your plans to transform learning address the systemic changes to how learning is organised that are needed to realise this goal.

Learners themselves might not differentiate between learning using technology and conventional learning, but empowered learners will be able to exercise choice in how they learn and how they access their sources of learning. This will increasingly mean that, when that choice is provided, learners will frequently choose ICT in preference to traditional media and tools such as paper and pencil. This is because the medium of ICT offers access to a greater range of source material, flexibility in how information is processed, enablement of the application of higher order thinking skills, and the means to design and create outcomes and products constructed from information.

Question 6: Can learners choose to use ICT whenever they require it?

Question 7: Do learners have choice from a sufficiently wide range of source material and software tools?

Question 8: Have learners acquired the level of ICT Capability needed to become accomplished learners and high achievers?

Teaching in the School of the Future will inexorably be adapted to this vision, for teaching methods transported unchanged into an environment where e-learning is working successfully are likely to be significantly out-of-step with the new expectations of learners. The notion of e-teaching is an equally valid concept as e-learning, and one that implies that teaching can be more effective when the teacher is confident with using ICT ('e-confident') and fully conversant with a pedagogical understanding of how e-learning methods can be made more effective than when using traditional media. The corresponding definition arising from this understanding would be that '*E-teaching is teaching that supports learning where both make effective use of new technologies*'.

Whilst one can anticipate, with the arrival of e-learning, that significant changes will be needed to the methodology of teaching, one truism remains; the impact of the inspirational teacher on the motivation and determination of the learner is unlikely ever to be surpassed by an on-screen resource, now matter how well-produced.

Question 9: Are the plans to adapt and develop e-teaching synchronised with the plans to develop e-learning?

Question 10: Can all teachers identify the attributes of effective teaching that will be unchanged by implementing e-learning, and also those aspects of current teaching expectations that will need to change?

What are the attributes of the e-confident learner?
How should these attributes be acquired?

'E-confidence' is a term that has underpinned the 'Strategic Leadership in ICT' (SLICT) programme for headteachers run by the National College for School Leadership (NCSL). 'E-confidence' is defined in whole-school terms by a set of criteria against which schools can measure their progress in acquiring and developing ICT. Within an e-confident school an e-confident learner will possess a complimentary set of attributes, enabling them to work effectively as learners within that environment.

For the individual learner e-confidence will stem from knowing that they are effective as learners and are making good progress towards learning goals that represent high individual achievement.

There is a need for a clearer debate about the learning model that underpins the notion of e-learning. Digital technologies allow schools to promote creative activities that stretch pupils' capabilities - or they could be used for 'pedestrian' activities that are more about controlling pupils' learning. Except in some well-publicised examples, most schools are not yet fully exploiting the full potential of using ICT for learning. An example of effective ICT use would be one where pupils plan, direct, edit and present their own films. To realise the potential of e-learning we need to find how we can push the use of ICT in schools towards the creative end of the spectrum and away from 'skill and drill' activities.

> Question 11: Where on the spectrum, from a controlling and pedestrian use of ICT, to an empowering and creative use, does your current use of ICT lie?
>
> Question 12: How far towards the high-achieving end of this spectrum will your e-learning development plans take you?

Successful e-learning can be shown to promote:
- Iteration and modelling using ICT, e.g. in writing, design, maths, science, PE and music.
- Learners taking more control over the direction of their learning
- Creative development and media literacy e.g. digital video, photography, animation and music
- Gaining knowledge, understanding and skills beyond that of the teacher

- Use of ICT to locate, gather, synthesise, analyse, reconstruct, communicate and present information and understanding
- Learning out of school in other settings and environments
- Social collaboration on joint tasks, both face to face, and in online collaboration
- Deeper analysis of concepts, processes and visualisation
- Developing thinking skills and problem solving strategies

When we examine the nature of e-learning we find a broader series of 'e-words', like excite, entertain, engage, enthuse, exchange, enrich, enhance, extend, empower and embed. The consequence of a school successfully promoting e-learning - an 'e-confident' school - will be that the use of ICT will be seen as embedded within the workings of the school.

There is an implicit hierarchy in considering the steps by which e-learning develops in a school. Successful development of e-learning will be accompanied on one axis by the movement of pupil engagement from passive to active learners. On the other axis there will be a corresponding move from shallow to deeper learning. There will be stages on the journey which will increasingly promote active engagement and deeper learning.

This hierarchy describes the nature of ICT use and rises through exchange, enrich, enhance, extend and empower. These steps show a good correspondence to the hierarchy of thinking skills described by Bloom's Taxonomy; Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation.

ICT and Learning
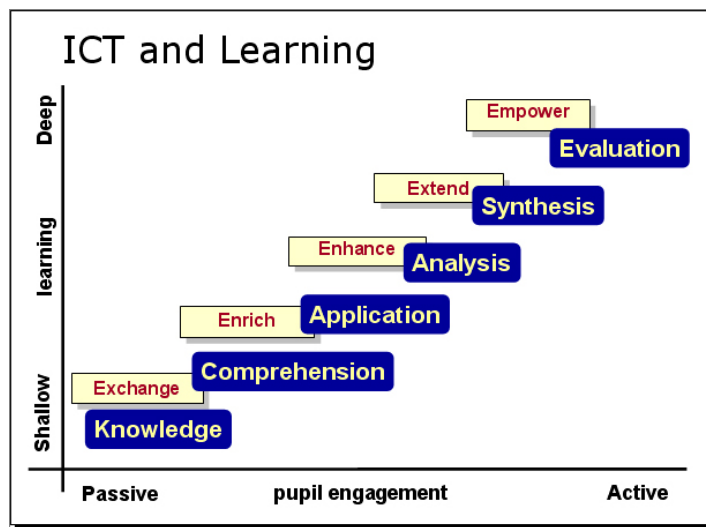
The effective development of e-learning would be accompanied by evidence of the move towards active, empowered learning employing higher-order thinking skills.

This evidence would include a move from:
- 'controlling technology' to 'self-directed' learning
- low capability to high capability
- an emphasis on teaching to a greater focus on learning
- 'teaching pupils' to 'facilitation of their learning'
- defined, linear learning to creative and lateral learning
- directed learning to personalised learning
- school-based to distributed learning

> Question 13: To what extent do teacher development plans promote teaching approaches which complement the characteristics of effective e-learning?

The e-confident learner will consequently need to cultivate a particular set of attributes and behaviours in order to be effective in learning in more self-directed ways, exhibiting high capability and working at tasks which will require a higher level skills set than may have previously been the case.   Such attributes will need to be acquired within learning programmes.

An effective learner would be expected to be:
- skilled across a range of practical and intellectual areas
- knowledgeable of many contexts for learning
- have competencies appropriate to learning in different situations
- have good research skills to find out what they need to know
- know how to work at levels that apply higher order thinking
- have the capability to create outcomes that represent good achievement
- know how to learn and how to appraise their progress
- be self-directed, responsible and resourceful learners

In addition, the e-confident learner will :
- have a wide range of generic ICT skills
- use ICT to learn away from school
- use technology creatively, with ease, in life outside school

- be able to learn new skills as needed

- be prepared to explore and experiment in their use of ICT

- have a high level of information literacy

- know when ICT can assist their learning

- be able to talk about the way ICT can enhance their learning

- be able to select the appropriate tool for the task

Taken together, an e-confident and effective learner will know how to utilise technology in order to realise their potential and maximise their effectiveness. They will be knowledgeable, skilled and capable across a broad range of attributes. They will know how to learn and how to appraise their effectiveness.

When placed into an e-confident school context it will be the environmental effects which determine how successful and e-confident the learner will become, for example, how e-learning and e-teaching are organised. One of the traditional weaknesses of a subject-based curriculum has been the lack of emphasis on teaching the learner how to learn effectively - and to be able to appraise their own learning strengths and weaknesses. Many schools with innovative curriculum designs now address this through the objective of 'Learning to Learn'.

There is a case for the attributes associated with 'e-confidence' to be acquired through a planned learning programme. Logically, the curriculum in the School of the Future should make explicit the learning of learning, or meta-learning, as well as the attributes associated with the development of e-confidence. Indeed, there is a strong case for 'Learning' to be the number one subject in the curriculum of the School of the Future, a subject embracing both the components of meta-learning as well as the development of e-confidence.

> Question 14: To what extent will your curriculum development plan allow learners to develop the full range of capabilities as a learner, together with the high level of ICT Capability necessary for e-confidence?

Another aspect of e-confidence is the confidence and judgment needed to take risks that might lead to more successful outcomes. The notion of 'failure' may need a rethink since it is now broadly accepted that one of the most natural ways to learn is through the appraisal of one's mistakes.

An acceptance of such an approach could be embodied within all learning programmes, i.e. encouraging learners to analyse their mistakes and to learn from them. By implication, assessment methods could reflect this approach by being less about passing or failing, and more about weighing up strengths and providing diagnostic feedback about how to improve.

With the increasing use of e-learning systems one could expect assessment to be a much more integral and formative part of the learning process, and one that was more diagnostic than is currently found in the '7 out of 10' style of computer scoring that has been the mark of much 'drill and practice' software. Important within this consideration was the need for a sense of progression in acquiring the skills of e-learning and clarity in how progression could be recognised.

If we examine the nature of e-confidence in the broader context of e-learning and current educational developments, a key question would be: "How could schools place more value on those learning outcomes most valued by employers, as well as examination results in the formal subjects of the curriculum?"

Weighed against this, we might consider that some of the lack of evidence of the impact of ICT in schools on pupil achievement may be due to the fact that current assessment methods do not place sufficient value on the e-confident and effective learner competencies listed in the previous paragraphs. Changes to what is taught and how it is learnt, implicit in the aims of the 'Building Schools for the Future' programme, will need to be reflected in the assessment methods used by schools - because "today's students are no longer the people our educational system was designed to teach" (Prensky, 2001). Arguably, the values, purposes, methods and outcomes of education in the Twenty First Century need to be much more closely geared to the world of life and work beyond school rather than to the academic values of the past.

> Question 15: How can the pace of developments in the assessment methodologies, used to measure progress and attainment, be accelerated to be more compatible with the broadening of learning styles supported through the medium of ICT?

What curriculum structure would support the most effective application of e-learning?
How can the assessment of learning be best organised?

Curriculum development has been a positive feature of UK education over many years. The SMP Maths Project was an example of an early development in learning methodology that supported teachers by taking away much of the basic lesson preparation tasks. The scheme took pupils through self-paced activities and left the teacher to manage the issue of worksheets and resources, and to mark particular questions in the booklets when pupils reached them. The scheme in effect turned teachers into administrators, keeping track of which pupil was engaged with which activity. The scheme did not set out to make lessons geared wholly to completing tasks set out in workbooks - but in most schools this was the consequence.

In many ways, SMP was an early example of a learner-centred programme with many parallels to activities now found on-line. There are warnings here for designers of such learning programmes to consider with care the essential role of the teacher in learning activities which are not directly focussed upon the actions of the teacher.

The National Curriculum in its current form is less of a straitjacket than it has previously appeared to be. Although the areas of learning are currently specified, how they are taught and how they are learnt are still largely the choice of individual schools and teachers. Many schools are using this flexibility to design learning programmes that fit more closely to the ways that particular groups of pupils prefer to learn. In those choices ICT has played an increasingly important role. There are now many good examples of content-rich e-learning programmes. Many of these are seeking to use ICT to learn in new ways, and there is growing evidence of the greater effectiveness of learning in such situations.

But there is also scope for re-examining what is taught and learnt. In the subject section for National Curriculum ICT we are asked to 'value knowledge that falls outside traditional subject boundaries' and recognise that learning can be organised in different ways. It should include opportunities for complex projects that incorporate several subject perspectives. It should also recognise that knowledge is not static, or compartmentalised, and that its interconnectedness is often the cornerstone of creativity.

In the evolution of the National Curriculum there needs to be a focus on

knowledge-creation as well as knowledge-acquisition.

At a time when technology is facilitating communication in increasingly diverse circumstances, we are at the stage of trying to achieve what Marc Prensky characterises as 'new things in new ways' rather than using technology to allow us to do old things in new ways. In short, there is scope now for schools to innovate and to develop e-learning approaches that allow for different styles of engagement with learning tasks.   There is also greater freedom now in the choice of learning pathways, and the subjects that pupils will choose to study.

Question 16: To what extent are curriculum planners using the new freedoms to provide 'a modern world-class curriculum' that will inspire and challenge all learners and prepare them for the future'
(QCA Curriculum Futures)

The government's target for all schools to be making use of 'Learning Platforms' by 2007/8 will make e-learning a significant activity in schools. Learning Platforms, also referred to as Virtual Learning Environments (VLE), are described by the DfES as 'a broad range of ICT systems used to deliver and support learning'. According to Becta, such systems will offer:

- Continuity and extension of learning
- Increasing stimulating/motivational experiences
- The provision of wider and more flexible courses
- Involvement in, and management of, target setting
- Tracking of learning and interventions
- Improved planning and preparation
- Assessment for, and of, learning
- Reduced administration and improved organisation
- Involvement and communication with parents
- Progression by ability, not age
- Greater autonomy for the learner

The introduction of Learning Platforms will provide much scope for rethinking what is taught and how it is learnt. No longer need a learning experience be defined as a one hour slot with a bell ringing either side of it; and what is learnt need not consist of linear studies in a traditional subject area spread out over 11 years, or provided by a single institution during the hours of nine a.m. to four p.m.   Subjects of study could

be modular, integrated, personalised, offer different lengths and depths of experience, and chosen for the weight of the contribution they make to the education and development of individuals who will live and work in the world beyond school.

However, despite the scope for introducing improvements to learning through the use of Learning Platforms, the backstop to curriculum innovation currently remains a largely unreformed assessment system that takes little note of advances in virtual learning technologies.   Learning Platforms provide scope for a more integrated approach to assessment across a much broader set of parameters. Innovation in what is taught and how it is learnt could never fully develop if the terminal examination, undertaken in silence in a room without access to ICT, remains the major means to formally measuring what a student has learnt.   At the present time, assessment methods 'largely identify memorisation and recall rather than assessment at the point of learning' (Passey, 2006). Furthermore, the terminal examination has little ability to capture a broad range of personal capabilities and attributes valued by employers.

Question 17: To what extent do schools' plans for new investments in Learning Platforms focus on improvements in learning quality and the management of learning through a more innovative use of metrics?

In the School of the Future how can assessment be best organised to capture the full profile of achievement that we will aspire to nurturing in our future learners? Significant reform of the assessment systems, that currently seek to measure what has been learnt, is now necessary.   There is a growing need to evaluate a much broader profile of learner competencies and capabilities if the new outputs to the education process are to be in tune with its new inputs. There is scope here for e-learning systems to identify and capture how effectively the student is learning, what the student knows, what they understand, as well as the methods and techniques that they employ.   Such systems will be able to monitor a broad profile of learning attributes and provide feedback to both teacher and learner.

In considering reforms to assessment, the following principles will be relevant. Reforms to assessment practice should seek to:

- elevate the role of the teacher to a leader of learning
- make use of the ability of digital technologies to measure and process a greater range of student performance information.
- measure personal attributes and qualities as well as subject-related outcomes
- be more integrated with individual learning activities
- allow for a range of media use and learning methods
- give rise to more enabled e-learning and e-teaching

> Question 18: How should assessment professionals work to achieve the reforms needed to assessment methods so that we can capture the full range of attributes developed by e-confident learners, and become more aligned with a broader range of learning methods and styles?

In this paper we have examined the attributes that an e-confident learner will need to acquire, and we accept that acquiring these should be a planned part of the school curriculum. We have recognised that the attributes associated with e-learning lie within a package of capabilities and personal qualities valued by employers, but not made explicit in the Programmes of Study that describe the National Curriculum in its current form. We know that there is already scope for innovation in how school makes available learning opportunities and student choice in what is studied, and we acknowledge that the National Curriculum is undergoing further review in order to develop it into a 'World Class Curriculum'. We believe that assessment methods are now out of step with such developments and look forward to innovation in this area as learning platforms develop, and their contribution to Education grows.