

Impact of ICT on Schooling : a NAACE report

Introduction

This report presents the views of the members of NAACE on the likely impact that developments in ICT will have on the way that education might be organised in the future.

An attempt to gain a consensus of views on schooling in the future will sensibly acknowledge that the collective perspective on this subject will be undergoing evolution as both technology, and education policy, move forward in time.

The NAACE membership represents a significant body of expertise in current ICT development. As such, the collective views of this membership are likely to offer a broad vision of developments in this area, and describe a number of possible scenarios.

Two NAACE events have taken place to take views from members, and individuals whose work relates to this area. A weekend think-tank event was held last year for a number of NAACE members and other invited guests. The initial thinking of this group steered the nature of the questions posed to discussion groups at the 2001 NAACE conference. These discussion groups, representing a significant proportion of the NAACE membership, produced a wide-ranging set of responses and provided a rich resource of ideas, predictions, questions and perceptions.

This body of material has proved difficult to process or categorise, but members of the NAACE executive committee have worked to find a structure to secure the major, or recurrent themes in a way that can be presented back to the membership as a record of the collective views of this organisation at this point in time.

In this paper we present a preamble, a worked set of views of members and an appendix of thoughts thrown up from the initial think tank.

Predicting the future of schooling

In this section some factors that might affect the course of development in the nature of how education is organised are identified. The extent to which schools might control their futures, or whether schooling will be swayed by external factors, is essentially an unknown quantity to be judged as events transpire. There are, however, some identifiable trends at work here, together with some issues of the day, which might serve as current predictors of change.

- ICT may offer a partial solution to teacher shortages in some knowledge-based subjects through the use of online courses or videoconferencing.
- Due to the rising costs of schooling and the need to expand the lifelong learning agenda, there is likely to be a continuing momentum for promoting and evaluating the contribution to education of e-learning from government and commercial players.
- ILS, despite mixed evaluation reports, has established a model that adapts well to e-learning. With the new emphasis on broadband and 'content' development, a developing e-curriculum will become available for the education community to evaluate.
- Evidence reinforces the view that effective teaching remains an over-riding factor in assuring effective learning. But it is known that learners respond well to an adapting style of learner support during their development. Teaching is therefore not to be seen as a uniform activity, but can range from a formal leading role, through a mentoring role, to a consultative role, depending on the degree of learner autonomy. The teacher/learner relationship should be a recurrent focus for discussion as the e-learning agenda develops.
- The degree of parental satisfaction with schooling will be a factor in determining how politicians steer the power equation, which currently favours the autonomy of schools. Government policy on ICT has the capacity to broaden the marketplace in learning.

NAACE members' views on the impact of ICT on Schooling

This collection of views is representative of the range of responses made by members of NAACE in the discussion session at the 2001 conference in Blackpool. The process of compiling them has involved reading, extracting, distilling down, interpreting and categorising the written comments from discussion groups. This process has sought to find trends in the views of NAACE members. It should be viewed as a snapshot in time rather than a scientific study. As such, this organisation has provided much food for thought on this evolving subject.

Strategy

Unlike for literacy and numeracy, ICT in schools has so far evolved through a series of initiatives rather than from an overall strategy. The literacy and numeracy strategies provide successful models for managing change which might usefully be extended to ICT.

Curriculum

A main goal of education will be to develop independent, autonomous learners. The life that pupils will enter beyond schools will require this attribute for success.

We need to move from measuring knowledge, to measuring the ability to apply skills.

ICT should be placed at the centre of the curriculum because, at its best, it is the most effective medium in which to learn.

The BBC and other content providers should aim to contribute to a national curriculum resource bank of 'adaptable digital assets'.

There should be a national development programme of learning resources, plans, templates, electronic topic folders, assignments, worksheets, etc.

Teaching

The teacher's role has been shown, time and again, to be crucial in learning. We should seek to balance suggestions that young learners can learn without teacher/mentors. Learners can reach a stage where they become self-motivated and can learn independently, but major successful education programmes of school-aged learners will be explicit about the key role of the teacher.

We should seek to define the various roles within teaching, perhaps to identify different people to perform these roles. In a school of the future there may be fewer localised specialists and more on-line minority subject specialists and in-class mentors.

The school of the future might make greater use of 'learning mentors', 'resource managers' and 'information officers'.

Learners of the future will have access to the world's reservoir of information. The teaching role must place less emphasis on supplying information and more emphasis on managing learning. Subject expertise will remain in demand in one form or another.

Teachers using ICT will increasingly promote the acquisition of higher order application skills. To do this will require a clearer definition of the learning process and the development of thinking skills, research skills, and information skills, than are currently defined in the ICT curriculum.

In this time of teacher shortage we should re-utilise third age learners, and teachers not currently in service, as a resource for schools. How can ICT help to make teaching more attractive?

The best learning can occur when pupils are creating content and teaching it to others.

'Real' tasks have greater potential for learning than simulated ones. A competency-led approach to the curriculum should aim to provide real contexts for learning.

We must recognise when, for individual pupils, teaching without ICT is causing underachievement. We should be active in making ICT available wherever it promotes greater achievement. This is an equal opportunities issue.

Professional development

Government reform of education has not tended to promote collegiality amongst the teaching body. New technology can promote collaborative approaches which support teacher development and quality in schools. Email and conferencing are commonly used by other professional groups but are still relatively new to the teaching profession.

NOF-funded ICT training has begun the process of allowing teachers to consider pedagogical issues relating to promoting higher educational standards using ICT as a medium. This is an important step. Further work is needed in all subject areas.

The current teaching force is still largely uncomfortable with ICT uses that have not formed part of their own education. Further support for teacher development in ICT is a just and necessary activity.

Every teacher now needs to possess personal ICT. They need the right tools for the job. Teachers are disadvantaged by not owning ICT and being fluent in its use.

New initiatives should no longer ignore the time required for professional development. Future zero-time initiatives will remain unpopular with the profession. The changing nature of teaching in a changing world requires a new look at how CPD should be organised for this time-pressed group of people.

CPD should seek to give teachers the confidence to utilise during lessons, the ICT knowledge which pupils have, in a way that doesn't lower the teacher's self-esteem.

Learner skills

There is a need to redefine progression in terms of ICT competencies, or information skills, or higher-order learning skills. Bloom's taxonomy provides a guide for re-evaluating levels of attainment in ICT.

It is an overdue task to define the hierarchy of thinking/learning/information skills that constitute progression in using ICT.

There is a growing divide between pupils who have become accomplished at using a range of ICT at home, for their own learning developments (games machines, digital TV, personal PC) and the controlled environment of the school, which often controls access to low levels of ICT use by comparison.

Learning is often of a higher quality at home without the restrictions of schooling upon the learner - and limited access to ICT. What lessons are there here for curriculum planning?

What capacity do schools have for teaching pupils to be rapid, multi-tasking learners and productivity workers, able to succeed in the e-enabled organisations of tomorrow?

We should focus upon what schools do well and make these functions explicit. They have the social advantage. They can provide practical experiences - they will excel in providing education in sports, music, D&T, practical science, etc. Schools can impart the knowledge, teach the methods and routines, and develop the skills and competencies in formal settings.

We should aim to re-evaluate the social dimension of learning and learner support. This is particularly important where learners need to overcome learning disadvantages.

Learning broadly happens away from schools, when a pupil reflects upon, values and internalises that which has been taught. Successful schools will be those that provide strong support for the learning that takes place outside taught lessons.

Learning at its best is a consequence of teaching, but learning can be promoted best by making the learner into a teacher. We should focus more on the learner as presenter, teacher, etc. as a key learning method.

If every pupil had a laptop we would have the basis for forging a new approach to learning which genuinely promoted equal opportunities and high standards. Targets for ICT should seek to reach the goal of ICT for all as soon as possible.

Schools don't always nurture the things that employers are interested in. Whilst employers might be interested in thinking skills and team working, they have to use GCSEs as general hurdles before applying their own selection criteria. Schools should seek to teach that which lies within the selection criteria for a job.

Curriculum

A knowledge-centred curriculum wastes learning time through duplication.

A competence-based curriculum apportions knowledge where it has a relevance to the competencies which are being taught.

The National Curriculum should be developed much more around processes and skills than through content.

We should evolve the ICT curriculum away from machine skills to a learning skills hierarchy.

Educationists should pause and study the works of Howard Gardner, John Abbott, John MacBeath etc. We should review the process of teaching and learning much more in terms of what research is telling us about how people learn.

The academic route to success dominates the English education system.

In most European countries all routes are valued and promoted.

How can we make the English education system less inward-looking?

The Japanese abandoned the curriculum we currently aspire to some years ago, and are pursuing the curriculum we once had.

The current curriculum is being driven by Literacy, Numeracy and SATs. How far will we go in this direction before we realise once again that the school curriculum should, above all, provide a broad and balanced education?

Learning resources

Libraries are often information-rich but information-handling poor places.

ICT rooms are usually information-poor but information-handling rich places.

Schools should aim to bring the information and the information-handling tools together.

Assessment

Assessment remains a problem area. We define that which is worthy as that which can be measured. More work needs to be done on how we can attach more value to skills, competences, knowledge and understanding.

Assessment is only natural when it is assignment-based or otherwise contextualised.

Ethos

Some of our best schools have established a set of values and an ethos which is noticeable to the school visitor. This can often be a key influence on standards. To raise standards in all schools we should aim to define what ethos is and ensure that all schools promote it.

Anywhere learning

We can't keep filling schools up with desktop computers. The age of personal ICT (e.g. wireless laptops) is just beginning. We need to focus more on the anytime, anywhere model of learning.

The proliferation of digital television and the 'push approach' of digital broadcasting will help bring the lifelong learning agenda into the homes of many. Schools must seek to extend their influence to 24/7 learning.

TV defines 'entertainment'. Currently this is soaps and cops and robbers, but it could successfully transform minority interest pursuits into areas of broader popularity. TV could try harder to redefine learning something new as entertainment.

Possession of ICT at home does not necessarily correlate with effective use, any more than it does with books. Schools need to consider exactly how they can influence family learning with ICT.

Restrictions to the current schooling model

There is a tension between social control in schools and learner autonomy. Fundamentally, the interests of the teacher and the learner are different. They will not naturally converge. The interests of both groups need to be promoted and harmonised.

We are at the brink of seeing greater parental choice in education pathways. We should build this into our thinking for all ICT developments in schools.

A good school system must provide successful routes into lifelong learning and employment for 100% of its pupils. Currently schools see their success only in terms of exam results. Destinations are a more important indicator of the success of schooling.

Final note

The editors of this report thank the NAACE membership for its contributions to this paper. This is an evolving area and this paper cannot represent the last word on the subject. We anticipate that we will bring forward further updates on this subject, and we invite members to continue to bring forward their views, comments or predictions. As an organisation we wish to continue to record, collate and disseminate the views of the membership on the important question of the impact of ICT on the future of schooling.

Appendix

In the notes that follow are presented the thoughts of those members and guests who were invited to the initial think-tank meeting on the future of schooling. These were recorded on 'Post-Its' throughout the event and stuck on the venue walls under a number of suggested headings. Presenting these thoughts in their 'raw' form marks a departure from the usual format of such reports. These ideas, statements, perceptions and insights are straight from the minds of individuals who are broadly representative of the NAACE membership.

As such they provide the reader with a raw data set to ponder and, like a brainstorm, they describe a broad spectrum of ideas on this subject. We believe that knowledge, even without a formal structure, and describing many right answers rather than one, has the capacity to inform and benefit the thinking of the reader.

We thank the various authors of these ideas for their contribution to the issue of the future of schooling.

MONEY

In the future people will be paid in proportion to their contribution to society not by what the job they do pays.

Turn education into a true marketplace and schooling will be transformed almost overnight.

Why is our money given to schools to run an education monopoly ? Why isn't it given to parents to purchase from the best providers ?

Might there be a class divide based on those who want a 'people-based' education against an 'e-based' education?

There is a model behind the assertion that the NGfL will improve attainment. It's just that the model is based on selling more computers (cynical observation based on practical experience).

11-18 schools are £3.5 million businesses with a 50% failure rate.

There is a big issue to resolve of ownership and intellectual copyright of materials re: online learning and the virtual school.

BUILDINGS

People learning anywhere - why is a school so sacred?

When is a school not a school? When it is a community.

How do we build learning communities? How do we sustain them?

We need an extremely flexible 'digitalized approach' to planning.

- Ubiquitous IP, wireless networking for school, teacher and pupil-owned laptops
- Central, well-planned, reliable server focus
- Local support – technicians, office staff
- Reliable support from out-of-school experts.

Do we need to come together in order to learn? Generally yes, but not at every stage of development.

COMMUNICATIONS

The ultimate success of e-communications will be that learning becomes completely individualised.

Schools should promote creativity using the full range of ICT's so as to transform abstract ideas into concrete outcomes.

To enable schools to make flexible education-led use of ICT will require:

- A broad level infrastructure - for all schools
- Much higher bandwidth in due course.
- Reliable, centrally-founded, and supported at regional/national level
- National work on knowledge retrieval and content hosting

PEDAGOGY

Teachers have a marvellous capacity to assimilate change in such a way as to perpetuate existing modes of working.

What does 'being educated' really mean? We need to go back to basics on this question.

What is the interface between learner and tutor going to look like in years to come?

Content-driven education? Content-free education? Content-enabled education?

Does competence equate with education?

Should the education process be *done to* children, *be for* children, or *be with* children?

The future role of assessment – what about ipsative activities?

School is the agency external to the family, where young people can find and build their own identity.

Is best practice in ICT teaching about teaching the old way with PowerPoint?

The 'market' determines 'quality'. They buy/use it - or not. We should not seek to be the quality police.

In a learning school everyone is a learner and everyone can be a teacher.

Schooling – passive recipient. Education – active recipient.

Different 'content' but otherwise no change. This is 'the education game'.

What evidence do we have of the impact of text books on schooling?

Promote a bottom-up emphasis on learning: learners value themselves, they believe they can succeed, they engage in learning, they are encouraged by others, standards rise.

We may not yet be able to change what is taught... but we can change how it is learnt.

How do we evaluate appropriate learning material? What tools are there?

In the next 10 years we will learn a great deal about how learning happens in pupils heads. A lot of this relates to the use of ICT for learning and surely we must make this knowledge about learning impact on how we educate people.

The parenting role is a far more important one in the education of a child than the schooling role. We should provide more support for education in the home.

VISION

1. Philosophic naval gazing is unlikely to produce a steer for the direction of education policy vis-a-vis schooling.
2. We go on using a mixture of historic assumptions changed from time to time by current problems and exigencies.
3. Present schooling is not addressing divisions and failure for significant numbers of pupils.

Schooling will be required by societies in the developed world. Pupils working with a teacher will be what parents expect. Can we maximize the opportunity offered by the 'being together' in a school using ICT to support and provide education that can be offered through other means?

Binge or anorexia? We must seek to balance the level of 'content' we require a child to remember in judging them as 'being educated'.

People learn using difference learning styles.

There is a hierarchy of values in regard to curriculum content. Let us challenge this.

To what extent is overnight educational change (eg. John Major abolishing coursework) always ideological?

What is the importance of schooling as a social mechanism? Is the building/structure of the school important for learning? We spend money on these things that could be spent on learning.

Suddenly we (ICT community) need to be literate in a range of media, and able to discuss the impact on education – a vocabulary and grammar. Film, graphic art, graphic design, books, TV, multimedia, radio, music are now our business, in addition to the world of text that we currently occupy.

Do schools really have statements of ethos and values? Do they take these things seriously?

Educational change is largely about experiments by politicians. Isn't the education of young people too important to be handled in this way?

What changes outside schools will promote changes within schools?

When are *values* learnt? In school, or after mistakes have been made which have detrimental effects on society?

At what point does marginal activity impact upon the philosophy and structure of society?

Evolution or revolution? A slow change? - or will it be precipitated by developments in ICT?

Parents basically do not know what is happening at school. I am a parent. If my kids were now starting at secondary school I would be very intolerant of school not considering future-orientated approaches.

There is danger in forecasting. We always assumes the now as a year zero. Forecasting is, in itself, an intervention – the future is always now.

Future-possible, future-probable or future-preferable.
We should seek to shape the future we want.

Why does assessment have such a grip on policy and practice?

What's going to remain unchanged? Power relationships, gender, class role, developed world, developing world? Too many vested interests for there to be a consensus on change.

Who are we talking about when we talk about change? Do we wish for everyone to benefit or just ourselves?

Do we (educationists) have a key role to play in pressing for changes to assessment systems?

It is not ICT that improves learning – ICT is only the catalyst that lets teachers and learners believe that they can achieve more than before. The improvement has come from learners taking responsibility for their learning in this new ICT-supported environment.

CURRICULUM

The custodial requirement was originally only up to age 8 at which age they could pick up shuttles in the mill..... So what about apprenticeship concepts today?

Do we sort pupils into the categories we perceive as necessary (economically or politically) or do we try to create new categories to fit the kind of people that our changing society produces?

There are (at least) two discussions for the 'value' of a section of content – the teachers and the pupils. If we ignore the pupils' value system we can waste lots of resource and/or miss an opportunity for motivated learning.

New technology is being used in schools to deliver the old curriculum – it has been hi-jacked by the status quo.

Are IEP's the only way of integrating 'home working' and work in school?

Knowledge is portable, but feeds on information derived from data.
And given the right circumstances (e.g. time, security) it matures into wisdom.

Do we want an RSA-type competency-led curriculum? Is it indeed necessary to effect formal change in the curriculum to achieve this? All of this came through the traditional education system, yet all of us now have the competencies RCA talks about. How and where did we acquire these?

How do we define what constitutes socially-acceptable knowledge?

Will people have to pay for content, or will it be subsidized by advertising?

The child – the learner, what do they need, what do they want? What will they need in order to be successful/achieving within a future economy?

Will there be any point in writing textbooks for science and technology in the future?

In the next four years will we see a new education initiative to counter the undesirable side effects of the literacy and numeracy strategies?

The modes of teaching in the literacy hour prescription have been shown to depress boy's attainment and increase their disaffection. How does this way of managing change move us towards a desirable future?

ICT is a whole school issue, not a national curriculum subject issue.

The most important thing for young people to learn is to cook a meal.
Make this the number one curriculum objective.

Let us review the terms – teacher, tutor, learner, school, curriculum, assessment in the light of what ICT can do for education.

You used to run around and make friends in the street outside your home, and go to school for formal learning. Perhaps now you should go to school and play football and socialize, and go home to learn formally.

Information is the raw material of our age. To use it people need the right tools and the right skills.

Education that reflects social needs - not economic needs - is living in the past.

Most of the skills valued by industry and commerce are considered as 'cheating' as far as schools and examiners are concerned.

Moving the aspiration to implementation is a long journey – aspiration alone is of little use even if enjoyable as an exercise.

Should NAACE or other groups be making strong representation to funding bodies on 'how to engage teachers in content production' – in partnership with industry'?

Do we need to re-visit literacy e.g. Film scripts, multimedia area/skills.
What body exists to integrate/develop these into the existing curriculum?

ICT gives us, at last, the possibility of treating young people as individuals.

Can competence-based assessment be: more flexible
 just in time
 meet learning styles of a varied nature

Have we identified what skill sets children demonstrate when they use ICT? Are these valid?
Should these be legitimised? Or is ICT valid in its own right because it changes processes?

Teaching has institutional stability. Is this deserved?

Should the measure of schooling be what people are doing and thinking five years after they leave?

LEADERSHIP

How effective is education policy? We should evaluate it in 'best value' terms and suggest alternatives.

If I were king for a day.... I would destroy 'A' levels completely, so we had to build a new accreditation system from scratch, involving industry, parents and teachers (and maybe higher education).

If teachers are 'too willing to turn on a sixpence', why is this so?
Central direction of education causes teachers to be obedient rather than challenging and thoughtful. This is the intention of course!

Should education change be strategic or pragmatic - it should be both.

You can't cross a chasm in two leaps. Which leap do we need to make?

The higher the political profile of an issue, the shorter the possible planning timeframe.
If so, 'education, education and education' is a step backwards for education.

Teachers – how do we encourage teachers to take professional risks? Currently we seem to be inhibiting change by reducing confidence.

Leaders of policy will not get the message from pieces of paper. They will only get it through dialogue with people who do understand and who they trust.

Progress may come from increasing disaffection rather than attempting to decrease it.

MANAGEMENT

The main purpose of school remains the same. It is to separate the classes in our society.

Look at the roots of the plant now – but then don't keep pulling them up every day.

Who should be pulling the levers in education?

Are the levers in education, or outside education?

So what should we do about OfSTED now that the experiment is over?

CPD is the process of teachers generating their own understanding. This gives teachers ownership of and commitment to the approaches being adopted.

Shortage subjects will result in: learning managers in the class – specialist tutors on line.

Development of the role of homework. It is under used to extend and assess learning of ICT

School systems of administration are organised in the interests of teachers rather than children – control, convenience, keeping things going. Can ICT eliminate this bureaucracy?

Who do you need to persuade? Teachers, parents, politicians, governors, ITT, OfSTED, community, pupils themselves?

Pupil learning - innovative visionary leader

- finance
- flexible ICT infrastructure
- individual pupil needs
- community created ethos and values
- staff needs and contribution structure
- curriculum content and aptitudes

MISCELLANEOUS

Education hasn't moved on since Victorian times.

What do we want an education system to achieve?

What will be the impact on societies and cultures in a globalised society?

Schooling? I always thought that we schooled horses and educated children!

Moving from modernization – localization, individualization, (to anarchy)?

Should the state determine what individuals must learn or should individuals decide what they need to learn?

School-age consumers of education do not have the rights of the consumer.

A key issue – survival skills must be the essence of all education, personal, social and economic. What survival skills do we need as a country to avoid poverty (individual and on a national scale)?

I want an insight into what ICT might offer to supplement existing structures – to motivate non-participating pupils – to offer fresh starts for learning – to bring about re-insertion of pupils into mainstream education structures.

There is not a right answer unless it is multi-faceted, it accommodates diversity, it values people's diverse attributes. The past was not wholly wrong, but only bits of it are right for the future.

How as a practical matter can we achieve real change? And, as a first cosmic question, can we agree on the changes we want? Can we work through political institutions, social organizations, personal networks? What steps would we take?

How should schools measure success? How should society judge the success of pupils?

We should promote an optimistic view of young people today, their talents and capabilities and how the school system needs to promote these, not stifle them.

I can choose my dentist and my plumber, why can't learners at school choose their teacher?

If we want to measure what we value, how do we explicitly identify it, and accredit it? How do we shift perceptions from established measures e.g. 'A' Levels?

If the OECD predict that information will double every 73 days by 2015 – how fast will it double in 2025? What shape is an experiential curve when it is laid on its side?

Key Issue – we have to make some guesses about what society in UK is going to be like, in order to work out how schooling can be part of helping young people to survive successfully in their world. Even wrong, or fuzzy guesses would help.

How can ICT support social or educational improvement? Where are the ladders to offer the disenchanted and disaffected upward progress? How can we motivate them to climb out of the slough of despondency?

School failure, school refusal, unemployment, ignorance = political/social unrest.

Change in education has been incremental, not fundamental. How would we convince the body of educationists – teachers, schools, that they should embrace radical change?

What kind of autonomous life chances will a young citizen make with £12,000 of student debt?

Issues around the adoption of new technology: lessons to be learnt from history – what happened with TV,? What happened with radio? The situation may be different for ICT but there is scope for making the wrong prediction.

Politicians don't run supermarkets, so why do they run schools?

Lots of teachers are asking the question 'What else can I do?'

'Anything involving learning is what a school does' – discuss.

Why do we do things one way because we have always done them that way ?
Why do we still shuffle the letters on a keyboard?