21st Century skills: a perspective from England

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Abstract

A review of the system of education in England is provided. A review of literature of 21st century skills and what their place might be in a curriculum is presented. There is discussion of how 21st century skills are developed in early years, primary and secondary stages. Post-16 and higher education provision are critically explored, with the findings of an institutional research project applied to the existing literature.

The conclusion proposes that the pedagogical pressures of performativity make it challenging to introduce 21st century skills to the primary and secondary phases of education, largely due to the issues of how to assess the development of these skills. Nevertheless, there is a clear imperative to support teachers in both the development and assessment of these skills across the full age range.

Key words: performativity, collaboration, assessment, ATC21S, JISC

Introduction and theoretical background

What is an educated citizen? This is a question which has been debated for many years and will be explored further in this review. The question is to be examined with a view that a truly educated population is not necessarily one in which individuals possess a set of qualifications, but where their education has led to a set of shared values in which individual citizens have a high degree of self awareness and a strong sense of

social identity. The contention is that this is not something which can suddenly be acquired through a class, or even through leadership within a school, but is a reflection of the norms and values of the society in which the citizen develops. If there is a belief that education is a specific product, able to be quantified and measured, then there is a concern that the skills necessary for effective development in the 21st century will not be delivered. (ATCS, 2013)

It may therefore be appropriate to ask about the skills, knowledge and attitudes likely to be required for the next generation of citizens and to begin developing them in the learning communities in which our next generation of trainee teachers are operating. We need to ensure that they are ready to deliver what is needed to succeed in an uncertain future. This review considers the current strategies in place in the main stages of education in England and asks if they are fit for purpose in the current climate.

Bernstein (1970) famously suggested that "Education cannot compensate for Society" and there may be some truth in this assertion. It recognises that education alone is unable to mitigate the effects of poverty and social deprivation. All teachers know that there will be children in their classes who have consistent and continual support form families who value education. Alongside this first group will be children whose talents and abilities may not shine in school, but who are nevertheless also destined to be citizens of the next generation. Nevertheless, both groups are required to experience a lengthy education at the expense of the State and the later group will be likely to emerge from this with their social and economic status unchanged. (Mercer & Littleton, 2007). In promoting the education of the next generation of teachers and learners, there is a necessity to continually reflect on the aims and values being promoted and ask ourselves if we are demonstrating innovation in teaching and learning or are content to maintain the status quo.

To set the context in which children England learn, I have provided a short summary. Beginning with the first experience of formal education, most British children will find themselves in an environment termed the Early Years Foundation Stage. This is a framework designed for children in settings from the very youngest (often in childcare form as young as three months) to the end of the academic year in which they become five years old. Following this, children will move into Key Stage 1 (5–7 yrs) and then into Key Stage 2 (8–11 yrs). This marks the end of their Primary School education and they move into the Secondary stage. This is characterised by becoming gradually more specialised in the subjects studied as they move into Key Stage 3 (11–14) and then into their General Certificate of Secondary Education years (Key Stage 4: 15–16 years). Many young people will then continue into Further Education (16–18 years), with an increasing number then going to University. Some will take a break from education, resulting in the University population being predominantly (but not entirely) composed of people in their late teens and early twenties.

The next generation of teachers are predicted to be entering a world radically different from the last generation. Simply having specialist knowledge beyond the level of the young minds in front of them will not be enough. The digital technology available today makes the possession of factual information somewhat obsolete: we all know that we can search for material on almost any subject can be achieved in seconds. The school of the future will be unlikely to have much in common with the schools of the past. (Schleicher, 2010). The structure of the school day and the material on the curriculum will reflect the values of the 21st century society. Whether these developments increase access to social justice for all is a theme to which we will return later.

However, some things will remain constant. Long-standing teaching and learning methods will be unlikely to change greatly. Children will retain their sense of curiosity and wonder. Employers will recruit employees who can co-operate and communicate. Working life is gradually becoming more technologically focussed, with a need for the workforce to know how to continually adapt and innovate. Therefore it is a disservice to the learners not to consider how the skills needed to manage their lives in the future.

Defining the skills needed to succeed in the workplace of the future is, of course, challenging. (21st Century Science, 2011) There will be both new and traditional skills needed: an internet search of "workplace skills" reveals a great number of diverse definitions. Some of the most useful research in this field has been led by an international collaboration between governments, academics and technology industry to produce guidance on 21st century skills. Assessment and Teaching of 21st Century Skills (ATC21S). Following an extensive review of the available literature, the ATC21S partners identified four key categories using the acronym KSAVE (knowledge, skills, attitudes, values and ethics). Broadly speaking, they are

1. Ways of thinking: creativity, criticality, metacognition
2. Ways of working: communication and collaboration
3. Tools for working: information and ICT literacy
4. Ways of living in the world: citizenship and cultural competence (Binkley et al., 2012).

It is a working framework being proposed, with which not everyone will agree. Nevertheless, this provides the basis for some discussion in relation to the extent to which these skills are being developed at the different stages of the present system.

In the first instance, there appears to be an implicit expectation that the appropriate skills will be supported within a framework for the very youngest children. The early learning goals of the Early Years Foundation Stage (EYFS, 2014) and it is on four guiding principles that underpin practice; these are

1. That every child is unique; they are constantly learning and can become resilient, capable, confident and self-assured
2. Children learn to be strong and independent through positive relationships

3. Children learn and develop well in enabling environments
4. Children learn at different rates

To support these principles, the EYFS sets out early learning goals, with the prime areas of

a. Communication and language
b. Physical development
c. Personal, social and emotional development

In addition to these three prime areas, there are four specific areas through which the prime areas are strengthened and applied. These are

1. Literacy
2. Mathematics
3. Understanding the world and
4. Expressive arts and design

Settings are required to deliver this framework through planned and purposeful play, with appropriate adult interaction. The quality assurance process required that the leaching and learning is seen to involve

i. Playing and exploring
ii. Active learning and
iii. Creating and thinking critically

While much of the framework is welcomed by practitioners and early years' teachers, there is an emphasis on assessment of progress in all areas, beginning when each child is between two and three years old. By the time a child reaches five years old, a detailed profile has been created. The effectiveness of the teaching is used to measure the quality of provision, judged on the progress made by each child.

However, there remains an emphasis on the measureable elements of this provision and it is widely recognised that simply measuring progress in key areas (reading, mathematics and knowledge and understanding of the world) will be the ways in which a setting is judged. Therefore it is natural for the settings to place great importance on ensuring children develop well in these areas. As a result, a consequence is that if it cannot be measured, it falls into a lower priority. Many practitioners express concern over the time devoted to the development of those skills ACTC21S consider to be the most important for the citizens of the next generation (James, 2011).

Things continue much the same into secondary school. However, the popularity of subjects such as Psychology and Sociology is indicative of the increasing interest in subjects requiring a demonstration of critical thinking. The so-called soft skill of critical thinking, in which pupils undertake programmes of study and take exams where there

are no "right" answers. This requires teachers to be trained in the art of managing class discussion as they require small groups and, crucially, require the pupils to actively engage with risk: they may have to overcome the fear that there is no right answer and as a consequence, they may fail! (Black, 2010) This does not readily appear to be a strategy many head teachers wish to embrace (Sternberg, 1987).

Instead, secondary schools embrace the soft skills are largely through promotion of extra-curricular activities (Haensly et al, 1985) Sport, community service and travel opportunities give pupils the time to appropriate the ATC21S categories. Within some schools, there are debating societies and drama clubs: these all contribute in a constructive way (Penney & Harris, 1997). However, their success often depends on the passion and commitment of a particular individual teacher; they are rarely part of a local or regional strategy (Baumfield and Oberski, 1998). Nevertheless, there are formal programmes, such as the AQA Extended Project Qualification and the internationally respected International Baccalaurate (IB), but the former is not widely recognised by University Admissions tutors and the IB is taken by a small number of the most able pupils.

As such the picture for 21st century skill development in schools is bleak, what is the picture in the further education sector? This has a more direct focus on vocational training, providing opportunities for both school leavers and people who are taking a new career direction. This is largely employer led, with partnerships being created with colleges and other training providers. For example, Rolls-Royce, a huge multinational based in Derby (UK) provides training for its employees at all levels, driving their career ambitions and supporting their career development. The UK government is supporting this training in the form of higher apprenticeships, starting over 20,000 in the last two years. It is recognised that this training provides not only specific work skills, but supports the development of their English, maths and ICT levels. (Department for Business, Innovation and Skills, 2015)

However, this approach continues to be challenged by some authorities (New Visions Group, 2014). There is concern that there are two systems in place: an academic system, where students acquire formal academic qualifications such as A levels. This runs alongside a more vocational pathway, where students develop skills for employment. If one of the goals of education is to reduce the social divide between rich and poor, the process of reform needs to continue towards bringing the academic and vocational sectors closer together. This will have the dual benefit of making the academic pathway a more effective preparation for employment, while at the same time raising the status of vocational pathways. The careers education, information and guidance service would be a key partner in delivering such provision often seen as being able to unite two systems, promote diversity and blend traditional and 21st century skills (Chevalier, 2011).

A key recommendation of the ATC21S review was to support the development of Tools for Working, defined as digital literacy in the workforce. The Joint Information

Systems Committee (JISC) is a public body designed to support research into the use of information and communications technology in post-16 and higher education. JISC is funded by the post-16 and Higher Education Funding Council (HEFC), suggesting that this is an organisation whose contribution to the sector is valued.

JISC provides a working definition of digital literacy, understood to be those capabilities which fit an individual for working, living and learning. It is also considered to embrace medial literacy and life planning. This is the normalisation of digital literacy in mainstream practice through developing specialist roles, opportunities for research and through engagement with stakeholders such as professional associations, employers and sector bodies.

Not all Higher Education institutions are direct partners of JISC projects. Nevertheless, the Higher Education sector uses the JISC frameworks for a degree of self monitoring. This was the basis of a recent research project called "Digital Derby". This was an on-line survey conducted by the Learning Enhancement and Innovation / Technology Enhanced Learning (LEI / TEL) divisions within the University of Derby. It was sent out to all students and staff. The survey is included in the appendix of this review. Approximately four weeks were allowed for respondents to complete the survey, which was returned anonymously for analysis. Students and staff are frequently in receipt of this type of research and the high return rate is attributed to the good levels of communication between students, staff and LEI / TEL.

The findings will be used to identify training needs of both students and staff, with a particular emphasis on making realistic and appropriate recommendations for practice. The survey explored seven main areas. Some key findings include:

Attitudes towards personal use of technology

- Students were not seen as early adopters of new technology in University, but were more likely than staff to use a wider range of tools in their personal life.
- Students and staff had similar levels of enthusiasm for new digital tools.

Attitudes towards studying using technology

- Students were more confident in using learning technology when studying when compared to staff studying for CPD.

Skills development

- Both students and staff felt that the most common approach to developing their skills using digital tools were curiosity (self-taught with some informal training), peer support (using on-line manuals).

Encouragement to adopt new digital technologies

- Both staff and students agreed that new technology had to be easy to use and have direct application to their professional practice.

Tool usage

- The most popular devices used by staff and students were laptops and smartphones.
- Desktop PCs were favoured by staff.
- Announcements and Turn-it-in were the most frequently used tools within Course Resources.

As a result of these findings, a series of recommendations were made.

1. Further exploration of digital literacy practice is needed. To gain a clearer picture of how students and staff are using technology, a series of focus groups and case studies are recommended.
2. Further examination of the effectiveness of University provision is needed. An institutional audit is required, in which departmental and college provision is explored.
3. New technologies require active promotion. Support and guidance for students and staff needs to be available as part of the University service; the library is the point of first contact for such provision.
4. Digital literacy needs to be embedded in the curriculum. Programme design, assessment (both formative and summative) and teaching activities need to be audited to ensure that appropriate digital skills are being promoted.

Conclusions

The recommendations relating to digital literacy from the research at the University of Derby match those made by JISC. There is a clear need for skills development, but to achieve this effectively, there is a commitment to time and a more supportive infrastructure. Peer-learning and peer-supported exploration is desirable at all levels and in all roles. The need for a regular audit of how the barriers to the use of technology are perceived is an essential part of this process, as there are a range of issues raised by staff and students across a range of age-groups (Gardner, 2006)

These conclusions do not only relate to digital literacy, but to the range of ATC21S defined skills. With the transition from an industrial base to a knowledge and service base, the advanced economies are recognising that the ways in which we learn and then work are evolving. Our social relationships are also being transformed. People at work are expected to be active innovators and pro-active in their teams. Simple routines, operating at a technical level and a thing of the past. 21st century employees need to be able to collaborate and adapt in order to solve complex problems at a speed unimaginable until recently (Jenkins, 2006)

Teachers and the educational establishment recognise the importance of students being able to acquire 21st century skills. This is explicit in the EYFS framework and im-

plicit in the journey through primary and secondary education. It re-emerges post-16, as students prepare to enter employment, training and higher education.

In a performative environment, educationalists will need to begin to ask difficult questions about how these critical skills will be assessed. Teachers will need to re-focus on the skills rather than the knowledge outcomes and this will require a re-orientation in their teaching: it is happening already for the youngest children and in the post-16 sector. There needs to be a concerted re-focus on how these skills are promoted in order to genuinely prepare the next generation of students for the world they will inhabit.

References

Assessment and Teaching of 21st Century Skills (2013). ATC21S, http://www.atc21s.org/ Accessed 01 July 2015.

Baumfield, V., & Oberski, I. (1998). What do teachers think about teaching skills? *Quality Assurance in Education*, 6 (1), 44–51.

Bernstein, B. (1970). Education cannot compensate for society. *New Society.* 20th February 1970.

Binkley M., Erstad, O., Hermna, J., Raisen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012) Defining Twenty-First Century Skills. In Griffin, P., Care, E., & McGaw, B. *Assessment and Teaching of 21st Century Skills.* Dordrecht: Springer.

Black, B. (2010). "It's not like teaching other subjects" – the challenges of introducing Critical Thinking AS level in England. *Research Matters: A Cambridge Assessment Publication,* 10, 2–8.

Chevalier, A. (2011). Subject choices and earnings of UK graduates. *Economics of Education Review*, 30 (6) 1187–1201.

Department for Business, Industry and Science (2015). *On target for a higher skilled workforce HMSO.* Published on-line: 25 June 2015

Digital Derby, (2015). An *evaluation of digital technology usage by students and staff at the University of Derby*. UoD. https://digitalderby.wp.derby.ac.uk Accessed 04 April 2015.

EYFS, (2014). *Early Years Foundation Stage framework.* Department for Education, HMSO http://www.gov.uk Accessed March 2015.

Gardner, J. (Ed.) (2006). *Assessment and Learning.* London: Sage.

Haensley, P., Lupkowski, A. & Ellind, E. (1985). The Role of Extracurricular Activities in Education. *The High School Journal,* 69 (2) 110–119.

James, I. (2011). *Opening Minds.* Research paper presented at "What kind of education enables us to cope with an interconnected world?" A Cambridge Assessment conference, (March, 2011) London.

Jenkins, H. (2006). *Convergence Culture: where old and new media collide.* New York: NY University Press.

JISC. (2010). *Welcome to the design studio.* http://jiscdesignstudio.pbworks.com Accessed 4 May 2015.

Mercer, N. & Littleton, K. (2007). *Dialogue and the development of children's thinking.* London: Routledge.

OCR. (2013). *Website for A level Critical Thinking.* http://www.ocr.org.uk/Accessed 05 Feb 2015.

Penney, D. and Harris, J. (1997). Extracurricular Physical Education: More of the Same for the More Able? *Sport, Education and Society*, 2 (1) 41–54.

Schleicher, A. (2010). *The case for 21st century learning.* http://www.oecd.org. Accessed 05 April 2015.

Sternberg, R. (1987). *Teaching critical thinking: eight ways to fail before you begin Phi Delta Kappa,* 68, 246–249.
21st Century Science (2011). Website http://www.21stcenturyscience.org/Accessed 20 April 2015.

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Appendix 1: Digital Derby Introduction to the Survey

Digital Derby

Digital Tools Staff Audit

I would like to invite you to take part in a survey that forms part of the 'Digital Derby Project' being led by Learning Enhancement's TEL team. The purpose of this survey is to establish the current attitudes and preferences of staff relating to the use of digital tools at the University of Derby. The survey will be available until the 29th January. The information provided will be used to inform the development of a framework for the promotion, development and delivery of digital literacies for staff and students.

The objectives of this survey are:

- To determine the attitudes of staff towards digital tools and practice;
- To determine staff preferences for support and development relating to digital tools;
- To determine the digital tools and technologies currently used by staff;

The survey is divided into four sections and takes only a few minutes to complete. Responses are anonymous unless you choose to provide us with your contact details. The survey is available electronically at:
Online Version or you can download and print a copy of the survey here – Printable Version
We would like to maximise participation in order to ensure that as many staff voices can be heard as possible, so please promote completion of the survey to your colleagues. If you would like to find out more about the 'Digital Derby Project' then please the blog or contact us via learningtechs@derby.ac.uk.
Thank you
Technology Enhanced Learning
Learning Enhancement

- Digital Tools Staff Audit
- Introduction to Digital Derby
- Project Blog
- Useful Links
- Digital Derby – Digital Tools Survey Results
- Update February 2015
- Student Digital Tools survey launched!
- Survey Update

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Appendix 2: Digital Derby questionnare

EvaSys	Digital Derby - Digital Tools Audit	Electric Paper

Mark as shown: ☐ ☒ ☐ ☐ ☐ Please use a ball-point pen or a thin felt tip. This form will be processed automatically.
Correction: ☐ ■ ☐ ☒ ☐ Please follow the examples shown on the left hand side to help optimize the reading results.

1. About you

1.1 What is your main professional role at the University?
☐ Academic ☐ Professional Support ☐ Other

1.2 Which academic college or support department do you mainly work for?

☐ College of Arts	☐ College of Business	☐ College of Education
☐ College of Engineering and Technology	☐ College of Health and Social Care	☐ College of Law, Humanities and Social Sciences
☐ College of Life and Natural Sciences	☐ University of Derby Online Learning	☐ Buxton and Leek College
☐ Learning Enhancement	☐ Business and Student Services	☐ Careers and Employment Service
☐ Estates	☐ Executive	☐ Finance
☐ Human Resources	☐ International	☐ IT Services
☐ Marketing and Communications	☐ Strategic Partnership Unit	

1.3 Other (Please specify)

1.4 How long have you been employed at the University of Derby?
☐ Less than a year ☐ 1 - 2 Years ☐ 3 - 5 Years
☐ 6 - 10 Years ☐ 10 Years +

2. Attitude towards digital tools

Throughout this survey the words 'digital tools' are used to refer to 'a piece of technology, which could be hardware, software or an online service, that you use either for personal or professional reasons'.

Personal Use
Please rate your agreement to the following statements:

		Strongly Agree				Strongly Disagree
2.1	I use a greater range of tools in my personal life than I do at work	☐	☐	☐	☐	☐
2.2	Worries about privacy have restricted my personal use of digital tools	☐	☐	☐	☐	☐
2.3	Concerns about the impact on my professional image have impacted my personal use of digital tools	☐	☐	☐	☐	☐
2.4	I am concerned that using digital tools will have a negative impact on my work/life balance	☐	☐	☐	☐	☐
2.5	I am enthusiastic about using new digital tools	☐	☐	☐	☐	☐

2.6 At which stage would you be comfortable with adopting new technology
☐ Early adoption ☐ Established ☐ Industry standard

2.7 My personal use of technology has impacted on me
☐ Positively ☐ Negatively ☐ No Influence
☐ Mixed