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QUALITY SECONDARY EDUCATION BASED ON A COMPETANCY APPROACH: ISSUES AND CHALLENGES

Abstract

There has been active discussion of the so-called 21st-century competencies students need for a number of years. The process has been supported by the increasing significance given to PISA results and their comparative value for education systems wishing to improve or maintain their effectiveness. However, it's less clear that school systems have embraced the implications of achieving the target competencies by, for example, making the necessary changes to teacher training programmes.

What is a teacher?

To a mind of flint, the teacher must be iron, and strike sparks.

To the empty pitcher, the teacher becomes a well.

To the fallow mind, a planter of seeds.

To the cluttered mind, a gardener to weed and clear a space for growing.

To the sleeper, the teacher is the wake-up call of birds at sunrise.

To the wanderer, the teacher is a knowing guide.

To the developed mind, the teacher is colleague, listener, friend.

To all, the teacher is a mirror that shows not only the self but the path and its choices, the task and its demands--the difficulties, the joys.

To all and from all, the teacher is a learner, a person--and a prism through which the ordinary continuously reveals itself to be miraculous.

Gerald Grow, Division of Journalism , Florida A&M University(1977)

*The quality of an education system cannot exceed
the quality of its teachers.*

**McKinsey Report (2007) "How the world's best performing school systems
come out on top".**

Introduction

I should first of all declare an interest: to date I've been directly involved in the development and delivery of curricula as an editor, publisher, consultant, school inspector and governor. Latterly (since 1996) I've been an education consultant in Nepal, Malawi, Uzbekistan, Bangladesh, Ukraine, Romania, Turkmenistan, India, Maldives, Vietnam and Kosovo. As a consultant I'm obliged to analyse and synthesise, to be pragmatic and follow the requirements of the donor's project terms of reference, which hopefully (but not necessarily) reflect education stakeholders' actual needs. Generally this includes the sharing and application of best

donor/international/regional/national practice and therefore making sense of (at least for myself before passing on), and cherry-picking, the most relevant or most challenging or most thought-provoking examples.

In terms of the development of student competencies, my most recent experience is in Ukraine (EU Civic Education Project 2005-8) and the EU Education Sector-wide Approach Project in Kosovo (2009-10). More on both of those later.

What follows is a necessarily brief more-or-less chronological «journey» (but by no means exhaustive; I realise that I am skimming the surface of the international welter of initiatives and interventions concerned with developing student competencies for the 21st century, with a dash of project pragmatism thrown in. In preparing the article it was very much like dropping a pebble in a pool and seeing the ripples expand ever wider.

I've used the «What is a teacher?» quotation above to highlight the multiple roles/tasks a teacher has/will continue to have, some might say impossible tasks when faced with a range of abilities and learners' different ways of learning at differing speeds. The McKinsey report (2007) referred to in the second quotation (see below) sees teacher quality as crucial/essential.

1. Building for growth: business priorities for education and skills

This is the title of the Confederation of British Industry's (CBI) May 2011 education and skills survey: almost half of the 566 employers surveyed reported problems with literacy and numeracy skills in the workforce and identified this as an increasing trend: 40 per cent of employers surveyed are having to provide remedial training in basic skills. But businesses' top priority for schools and universities is «the development of employability-the fundamental attributes of team working, self-management and problem-solving» (Director General's Foreword). The CBI's definition of **employability skills** also includes **business and customer awareness, communication and literacy, application of numeracy and application of information technology**.

This has been followed by a joint CBI/National Union of Students (NUS) survey of university undergraduates in which 60 per cent of the 2,614 students questioned want universities to help them understand employability skills. Two thirds would like more support in developing these skills. At the same time, the majority of students (79 %) say that they decided to go to university to improve their job opportunities. Some universities already embed the teaching of employability skills into their courses, but the CBI has called on all institutions to follow this best practice. The CBI and the NUS have worked together to produce the guide called *Working towards your future* (CBI 2011), which explains what employers are looking for and provides practical tips to help students. The guide defines employability as: «a set of attributes, skills and knowledge that all labour market participants should possess to ensure they have the capability of being effective in the workplace – to the benefit of themselves, their employer and the wider economy». It lists what it calls the «key capabilities» thus:

- **Self-management:** readiness to accept responsibility, flexibility, resilience, self-starting, appropriate assertiveness, time management, readiness to improve your own performance based on feedback and reflective learning.
- **Team working:** respecting others, co-operating, negotiating, persuading, contributing to discussions, your awareness of interdependence with others.
- **Business and customer awareness:** basic understanding of the key drivers for business success and the importance of providing customer satisfaction and building customer loyalty.
- **Problem solving:** analysing facts and circumstances to determine the cause of a problem and identifying and selecting appropriate solutions.
- **Communication:** application of literacy, ability to produce clear, structured written work and oral literacy, including listening and questioning skills.
- **Application of numeracy:** manipulation of numbers, general mathematical awareness and its application in practical contexts (e.g. estimating, applying formulae and spotting likely rogue figures).
- **Application of information technology:** basic IT skills, including familiarity with commonly used programmes.

The first CBI report highlights the decline in UK rankings in the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA) tests: in science, reading and maths, UK secondary school students have slipped from 4th to 16th, 7th to 25th and 8th to 28th respectively between 2000 and 2009 (originally out of 32 countries, out of 65 in 2009). Only seven OECD countries spend more per student than the United Kingdom. While the United Kingdom spends almost US\$ 85 000, Germany or Hungary achieve a similar average performance and spend around US\$ 63 000 and US\$ 44 000 respectively¹.

The 2009 PISA results led the Secretary of State for Education to declare: «We have sunk in international league tables and the National Curriculum is **substandard** [my emphasis]. Meanwhile the pace of economic and technological change is accelerating and our children are being left behind. Our review will examine the best school systems in the world and give us a world-class curriculum that will help teachers, parents and children know what children should learn at what age».

However, a recent Policy Exchange² report called «Room at the Top, Inclusive education for high performance (Eyre 2011) talks about the UK's preoccupation with «floor-level targets» and reducing the number of young people Not in Education, Employment or Training (NEETS). The current system requires that «most pupils reach mediocrity and asks schools to arrange their structures with this as the primary expectation». The report makes a number of recommendations to change expectations:

¹OECD commentary on 2009 PISA results: Viewing the UK school system through the prism of PISA

²Policy Exchange is an independent educational charity which works with academics and policy makers from across the political spectrum on 'free market and localist' solutions to public policy questions: <http://www.policyexchange.org.uk/>

- National Curriculum based on advanced performance and the value of advanced subject knowledge and high level skills;
- qualifications which prioritise and reward high performance;
- a school inspection framework which assesses a school's ability to develop high performance as the main criteria of school quality;
- the abolition of «floor targets» and making figures for the number of children achieving at advanced levels more transparent at school, local authority and national level;
- schools required to offer advanced learning classroom-based and extra-curricular opportunities and expect large numbers of pupils to perform well on them;
- recognise the importance to 21st century learning of informal learning opportunities and the contribution it can make to high performance.

The new Government (now just one year old) set out in its Coalition Agreement a promise to give schools greater freedom over the curriculum, making a distinction between the National Curriculum (NC) and the broader school curriculum. As part of that commitment, the Government announced a systematic and comprehensive review of the NC for five- to 16-year olds. The rationale for the curriculum review in the government press release goes one step further: «**the new National Curriculum will, therefore, have a greater focus on subject content**, outlining the essential knowledge and understanding that pupils should be expected to have to enable them to take their place as educated members of society». There is no mention of target competencies or skills.

In a parallel development the «English Baccalaureate» (Ebacc) has been introduced as a «performance measure» in the 2010 school performance tables. It is not a qualification (although certification is being developed) but recognises where pupils have secured a C grade or better in the school-leaving GCSE examination across a «core of academic subjects», i.e. English, mathematics, history or geography, the sciences and a language.

There are already concerns that «non-core» or soon to be non-core subjects will be marginalised, even though they can contribute to the development of student competencies, for example religious education, citizenship education, design and technology and media studies. Given the growing number of schools becoming academies (see below), who can ignore the NC, the influence of the Ebacc could actually drive curriculum and classroom reform more than the review itself.

Schools are also being encouraged to become academies, the «carrot» being in Government-speak «greater freedoms to innovate and raise standards», including:

- freedom from local authority control;
- freedom to set staff pay and conditions;
- freedom in the delivery of the curriculum;
- freedom to change the length of terms and school days.

Academies receive the same level of funding as they would receive from the local authority, plus additions to cover the services no longer provided by the local authority. An attractive proposition, given the substantial budget cuts local authorities are having to make in the 2011/12 financial year and beyond to meet Government

targets. 547 secondary schools are now academies (16.5 % of all secondary schools with half a million pupils).

The National Confederation of Parent Teacher Associations' (NCPTA) January 2011 survey of 500 parents on the Coalition's education policy showed a clear preference for teachers and curriculum experts to determine the NC. 50 per cent felt the NC should cover «an overview of the core knowledge and understanding required» (50%), 37 percent «everything children should learn about»; there is no mention anywhere of competencies or skills in the survey questions or answers.

The Guardian newspaper's January 2011 «The School I'd like» survey of children's views on an ideal school resulted in a Children's Manifesto: a school which is **active, calm, comfortable, creative and colourful, expert** (i.e. the teachers, visitors), **flexible** (the timetable), **friendly, inclusive, international, listening, outside** (i.e. visits/study trips) and **technological** (iPads for all). The most important aspect of education children want changed is the timetable. «They wanted their educational experience to be tailored to them. Sausage-machine schooling, with a one-size-fits-all schedule, is their biggest complaint. They don't want to do less work. They just want work that enthralls and means something to them».

1.1 Curriculum and skills in the UK and the Republic of Ireland.

Each of the five countries in the British Isles has as lightly different approach to curriculum and skills development.

England's curriculum «Big Picture» (2008) aims to enable all children to become **confident individuals, successful learners and responsible citizens** and the focus for learning is on attributes and attitudes, skills and knowledge and understanding. **The Personal Learning and Thinking Skills (PLTS) framework (2007)** developed for English schools comprises six groups of skills which, together with the **functional skills of English, mathematics and ICT** are essential to success in learning, life and work. The framework captures the essential skills of: managing self; managing relationships with others; and managing your own learning, performance and work. It is these skills that will enable young people to enter work and adult life as confident and capable individuals. For each group of skills, a focus statement sums up the range of skills. This is accompanied by a set of outcome statements that are indicative of the skills, behaviours and personal qualities associated with each group. The six groups of skills are: **independent enquirers; team workers; creative thinkers; self-managers; reflective learners; effective participators.**

Wales produced a skills framework in 2008 for 3-19 year olds based on developing thinking, communication, ICT and number across the curriculum and have also produced in-service guidance for teachers on higher order skills in writing, literacy, reading and scientific enquiry (2010). There are also three nationally developed so-called «Wider Key Skills»:

1. *Working with others*
2. *Improving own learning and performance*
3. *Problem solving.*

The Wider Key Skills will eventually be included in Essential Skills Wales, a four-level certificated «suite» of skills in:

1. *Communication*
2. *Application of Number*
3. *ICT.*

The purpose of **Scotland's Curriculum for Excellence** is summarised in the four «capacities»: to enable each child/young person to be a **successful learner, a confident individual, a responsible citizen and an effective contributor** (similar to, but one more than, the English model above). The experiences and outcomes included in the curriculum areas build in the attributes and capabilities which support the development of the four capacities. «Every child and young person is entitled to develop skills for learning, skills for life and skills for work, with a continuous focus on literacy and numeracy and health and wellbeing».

The *Skills for Scotland* document (2007) sets out a number of overlapping clusters of skills: **personal and learning skills** (enabling individuals to become effective lifelong learners); **literacy and numeracy** (the five core skills of communication, numeracy, problem solving, information technology and working with others); **employability skills** (preparing individuals for employment rather than for a specific occupation); **essential skills** (that include all of the above); **vocational skills** (specific to a particular occupation or sector).

Northern Ireland's «Big Picture» of the curriculum has as its aim to «empower young people to achieve their potential and to make informed and responsible decisions throughout their lives...». The objectives are to develop the young person as an individual, as a contributor to society and as a contributor to the economy and environment. Cross-curricular skills are identified as: communication, using mathematics and using ICT and thinking skills and personal capabilities as managing information; working with others; thinking, problem solving, decision making; self-management and being creative.

The Republic of Ireland curriculum identifies five skills as central to teaching and learning across the curriculum: **critical and creative thinking, communicating, information processing, being personally effective and working with others**. These skills are «important for all learners to achieve their full potential, both during their time in school and into the future. They enable learners to participate fully in society, to engage in happy family lives, to prepare for working lives that are likely to change constantly and to engage with and enjoy learning throughout their lifetime». The assumption is that as learners develop competence in each skill in an integrated way across the curriculum they also develop competence in learning how to learn. The key skills framework breaks each key skill down into elements and outcomes: the elements describe the skill that learners will develop, the learning outcomes indicate what learners should be able to do as a result of developing this element of the key skill.

2. What competencies should 21st-century learners have?

2.1 *The Assessment and Teaching of 21st Century Skills (ATC21S) project.*

The ATC21S project was created by Cisco, Intel and Microsoft and launched at the Learning and Technology World Forum 2009 in London. During 2009, the

project's five working groups each produced a draft White Paper. These papers will be published electronically on the project website (www.atc21s.org). The drafts are not yet for formal citation but I summarise the abstracts below.

White Paper 1, **Defining 21st century skills**, describes a model for assessment of 21st century skills, based on an analysis of curriculum and assessment frameworks developed around the world³, and 10 important skills in four broad categories. The paper provides measurable descriptions of the skills, considering **Knowledge, Skills, and Attitudes, Values and Ethics** (the KSAVE framework). White Paper 2, **Perspectives on methodological issues**, surveys the methodological perspectives important for assessing 21st century skills. White Paper 3, **Technological issues for computer-based assessment**, reviews the contribution of new information-communication technologies to the advancement of educational assessment. White Paper 4, **New assessments and environments for knowledge building** looks at literature on knowledge-creating organisations to identify a sequence from entry-level 21st-century skills to mature levels of the skills defined by the project. White Paper 5, **Policy frameworks for new assessments**, describes the policy frameworks for assessment systems in Australia, Finland, Singapore and the United Kingdom, identifying where assessment of 21st century skills has been or may be developed in assessment systems that report information at the national or state, as well as local, levels.

The list of 21st century skills drawn from an analysis of 12 «relevant frameworks» provides an adaptable example, say the authors, of how to think about assessing 21st century skills; there are 10 skills in four groups as follows:

1. Ways of thinking

- *Creativity and innovation*
- *Critical thinking, problem solving, decision making*
- *Learning to learn, metacognition*

2. Ways of working

- *Communication*
- *Collaboration (teamwork)*

3. Tools for working

- *Information literacy*
- *ICT literacy*

4. Living in the world

- *Citizenship: local and global*
- *Life and career*
- *Personal and social responsibility, including cultural awareness and competence.*

2.2 The influence of the Programme for International Student Assessment (PISA).

What competencies should 21st-century learners have? This question and others («Are students well prepared for future challenges? Can they analyse, reason and

³12 'frameworks' from: EU; OECD; USA; Japan; Australia; UK

communicate effectively? Do they have the capacity to continue learning throughout life?») has been raised over a long period, as I indicate below. In response to the need for comparable evidence on student performance, the Organisation for Economic Co-operation and Development (OECD) launched PISA in 1997. OECD member countries (34) and 41 partner countries participated in PISA 2009. The recent analysis of this fourth set of results has promoted further debate and pressure for curriculum reform, most recently in England.

PISA assesses how far students near the end of compulsory education can use their reading skills to understand and interpret the various kinds of written material that they are likely to meet in daily lives; the extent to which they can use their mathematical knowledge and skills to solve numerical and spatial problems; and the extent to which they can use their scientific knowledge and skills to understand, interpret and resolve scientific situations and challenges.

Andreas Schleicher, who manages PISA for the OECD Education Directorate, describes some of the 21st challenges thus (*my bold italics*):

«We attempt to educate 21st century pupils using teachers who were trained in the 20th century and who work in a school system which essentially originates from the 19th century and is no longer up-to-date...How do we foster motivated, dedicated learners and prepare them to overcome the unforeseen challenges of tomorrow?...educational success is no longer about reproducing content knowledge, but about extrapolating from what we know and applying that knowledge to novel situations...»

Education today is much more about ways of thinking which involve creative and critical approaches to problem-solving and decision-making. It is also about ways of working, including communication and collaboration, as well as the tools they require, such as the capacity to recognise and exploit the potential of new technologies, or indeed, to avert their risks. And last but not least, education is about the capacity to live in a multi-faceted world as an active and engaged citizen. These citizens influence what they want to learn and how they want to learn it, and it is this that shapes the role of educators.

The knowledge world is no longer divided between specialists and generalists. A new group – let's call them «versatilists» – has emerged. They are capable not only of constantly adapting, but also constantly learning and growing in a fast-changing world.

If we spend our whole lives in the silo of a single discipline, we cannot develop the imaginative skills to connect the dots or to anticipate where the next invention, and probable source of economic value⁴, will come from. Yet most countries, with the possible exception of the Nordic countries, provide few incentives for students to learn and teachers to teach across disciplines.

⁴The *High Cost of Low Educational Performance the Long-run Economic Impact of improving PISA Outcomes* report (OECD 2010), uses economic modelling to relate cognitive skills, as measured by PISA and other international instruments, to economic growth. This indicates that relatively small improvements in the skills of a nation's labour force can have a very large impact on future well-being.

Value is less and less created vertically through command and control – as in the classic «teacher instructs student» relationship – but horizontally, by whom you connect and work with, whether online or in person. In other words, we are seeing a shift from a world of stocks, where knowledge is stored up but not exploited, and so depreciates rapidly, to a world of flows, where knowledge is energised and enriched by the power of communication and constant collaboration» (Schleicher, 2011).

Some powerful, appealing language and striking images here, as I have highlighted: unforeseen challenges; reproducing versus extrapolating; horizontal rather than vertical interactions; the striking agricultural image of a discipline «silos»; stocks versus flows.

Another OECD report (Ananiadou Claro, 2009), «21st Century Skills and Competences for New Millennium Learners in OECD Countries», separates «skills» from «competencies» partly using the European Commission's Cedefop glossary (Cedefop, 2008) and defines a skill as follows: «the ability to perform tasks and solve problems», while a competence is the «ability to apply learning outcomes in a defined context (education, work, personal or professional development. A competence is not limited to the use of theory, concepts or tacit knowledge; it also encompasses functional aspects (involving technical skills) as well as interpersonal attributes (e.g. social or organizational skills) and ethical values». A competence is therefore a broader concept that may include skills (as well as attitudes, knowledge, etc). Their working definition of 21st century skills and competencies is: «the skills and competencies young people will be required to have in order to be effective workers and citizens in the knowledge society of the 21st century».

They also presented findings based on a questionnaire survey of OECD members as follows:

➤ *Most countries recognise the importance and relevance of 21st century competencies, but don't give detailed or clear definitions of them.*

➤ *Most countries integrate the development of 21st- century competencies across subject areas with ICT skills often the exception, i.e. taught as a separate subject.*

➤ *21st- century competencies have often been introduced as part of a major curriculum reform.*

➤ *There are virtually no clear (formative or summative) assessment policies for these competencies⁵.*

➤ *There are few initial or in-service teacher training programmes which target the teaching or development of 21st- century competencies.*

2.3 Key competencies in New Zealand

To take one non-European national example, the New Zealand Curriculum (2007) identified five key competencies, described as the capabilities people have, and need to develop, to live and learn, the capabilities for living and lifelong learning:

⁵The Assessment and Teaching of 21st-Century Skills (ATC21S) is a research project which started in 2008 which proposes ways of assessing 21st-century skills and adopting those skills in the classroom.

- **thinking** (*using creative, critical, processes to make sense of information, experiences, and ideas*).
- **using language, symbols, and texts** (*working with and making sense of the codes in which knowledge is expressed; for representing and communicating information, experiences, and ideas*).
- **managing self** (*self-motivation; students see themselves as capable learners who manage themselves, are enterprising, resourceful, reliable and resilient; they have strategies for meeting challenges; they know when to lead, when to follow, and when and how to act independently*).
- **relating to others** (*interacting effectively with a diverse range of people in a variety of contexts, including listening actively, recognising different points of view, negotiating, and sharing ideas. Students who relate well to others are open to new learning and can come up with new approaches, ideas, and ways of thinking*).
- **participating and contributing** (*active involvement in communities; capacity to contribute appropriately as a group member, to make connections with, and to create opportunities for, others; understanding the importance of balancing rights, roles, and responsibilities and of contributing to the quality and sustainability of social, cultural, physical, and economic environments*).

The Ministry of Education notes that «competencies are more complex than skills, and also draw on knowledge, attitudes, and values in ways that lead to action». Successful learners combine them with the other resources available to them; they develop over time, as a result of interacting people, places, ideas. Students need to be challenged and supported to develop them in increasingly wide-ranging and complex contexts.

2.4 The Four Pillars

In 1996, the International Commission on Education for the 21st Century developed the «**Four Pillars of a Competency-based Education**»: 1) learning to do (solve daily problems); 2) learning to know (keep learning); 3) learning to be (ethically responsible) and 4) learning to live together (the ability to respect and work with others). These «pillars» were included in *Learning: the Treasure Within*, a report presented to UNESCO, and have been often referred to in subsequent efforts to identify and integrate 21st century competencies.

2.5 EU competencies for lifelong learning

The Lisbon European Council (23-24 March 2000) concluded that «a European framework should define the new basic skills to be provided through lifelong learning as a key measure in Europe's response to globalisation and the shift to knowledge-based economies, and emphasised that people are Europe's main asset». The Recommendation of the European Parliament and Council of 18 December 2006 on key competencies for lifelong learning listed eight key competencies:

- **communication in the mother tongue**, *express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing)*.

- **communication in foreign languages**, *communication in the mother tongue, as well as mediation and intercultural understanding.*
- **mathematical competence and basic competences in science and technology**, *develop and apply mathematical thinking in order to solve a range of problems in everyday situations; the mastery, use and application of knowledge and methodologies that explain the natural world, including an understanding of the changes caused by human activity and the responsibility of each individual as a citizen*
- **digital competence**, *confident and critical use of information society technology (IST) and thus basic skills in information and communication technology (ICT).*
- **learning to learn**, *pursue and organise one's own learning, either individually or in groups.*
- **social and civic competences**, *personal, interpersonal and intercultural competence and all forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life. Civic competence, and particularly knowledge of social and political concepts and structures (democracy, justice, equality, citizenship and civil rights), equips individuals to engage in active and democratic participation.*
- **sense of initiative and entrepreneurship**, *turn ideas into action; creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives; awareness of ethical values and promote good governance.*
- **cultural awareness and expression**, *appreciation of the importance of the creative expression of ideas, experiences and emotions in a range of media (music, performing arts, literature and the visual arts).*

These key competencies are all interdependent, and the emphasis in each case is on critical thinking, creativity, initiative, problem solving, risk assessment, decision taking and constructive management of feelings.

2.6 Partnership for 21st Century Skills

Dr. Tony Wagner, co-director of Harvard's Change Leadership Group, has identified⁶ what he calls a «global achievement gap», i.e. the gap between what even the best schools are teaching, and the seven «survival skills» students need:

critical thinking and problem-solving; collaboration across networks and leading by influence; agility and adaptability; initiative and entrepreneurialism effective oral and written communication; accessing and analyzing information; curiosity and imagination.

This skill set is a distillation of Wagner's interviews with business leaders about the most important skills needed to adapt to a rapidly changing world: «not just the skills for work, they are also the skills all of us need to be engaged and effective citizens in a 21st century democracy, as well as to be life-long learners». He also

⁶The Global Achievement Gap: Why Even Our Best Schools Don't Teach the New Survival Skills Our Children Need--And What We Can Do About It, Basic Books, 2008

makes the connection to teaching quality and gives the example of Finland, where the teaching profession has been «reinvented» and changed from an «assembly line» job to a high status «knowledge worker» job. «There are a few very high national standards, which are tested through sampling, and local schools and districts are expected to figure out how to teach and test these high standards». End result: only a 5% variance between the highest and lowest performing schools.

The cost of the achievement gap can be very significant: OECD's «Viewing the United Kingdom school system through the prism of PISA» notes that the «international achievement gap is imposing an invisible yet recurring economic loss». A recent study (Hanushek, 2010) carried out by the OECD with the Hoover Institute at Stanford University suggests that a modest increase in UK PISA scores by 25 points over the next 20 years, which is the kind of increase that some countries achieved just between 2000 and 2009, could imply a gain of US \$6 trillion for the UK economy over the lifetime of the generation born in 2010. Bringing the UK up to the average performance of Finland, the best performing education system in PISA in the OECD area, could result in gains of around US \$7 trillion. Narrowing the achievement gap by bringing all students to a baseline level of minimal proficiency for the OECD could imply a GDP increase of US \$6 trillion.

In the **United States**, the **Partnership for 21st Century Skills** (set up in 2002) defined 21st-century skills within a Framework (revised 2007):

Core Subjects and 21st Century Themes

Core subjects include English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics plus interdisciplinary theme and eleven sets of skills:

➤ *Interdisciplinary themes*: global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; health literacy; environmental literacy.

➤ *Learning and Innovation Skills*: (1) creativity and innovation; (2) critical thinking and problem solving; (3) communication and collaboration.

➤ *Information, Media and Technology Skills*: (4) information and (5) media literacy; (6) ICT (Information, Communications and Technology) literacy.

➤ *Life and Career Skills*: (7) flexibility and adaptability; (8) initiative and self-direction; (9) social and cross-cultural skills; (10) productivity and accountability; (11) leadership and responsibility.

The Partnership, echoing the findings of the OECD report quoted above, presupposes five critical 21st-century support systems that «an innovative support system must be created to help students master the multi-dimensional abilities that will be required of them»: **standards; skills assessments; curriculum and instruction; professional development; learning environments.**

Trilling and Fadel (2009 – in an appendix called ‘3Rs x &Cs = 21st century Learning’) condense the 11 21st century skill sets into seven Cs, thus:

1. **Critical thinking** (and problem solving).
2. **Communications**, information and media literacy.
3. **Collaboration**, teamwork and leadership.
4. **Creativity** and innovation.
5. **Computing** and ICT literacy.

6. **Career** and learning self-reliance.
7. **Cross-cultural** understanding.

2.7 What competencies do the most successful education systems in PISA target (Finland, Singapore, Republic of Korea?)

Finland

The key competencies have been taken into account in the aims and content of subjects and cross-curricular themes. In basic and upper secondary education, the key competencies relating to communication in the mother tongue, communication in foreign languages and mathematical competence and basic competence in science are included in the aims and content of mother tongue and literature, foreign languages, and mathematics, environmental and natural science, biology, geography, physics, chemistry, respectively. Key competencies relating to technology are included in mathematics, natural sciences and, in basic education, in crafts (technical and textile work) and home economics. Social and civic competencies are primarily included in history, social science and health education and, in basic education, home economics. Cultural awareness and expression is particularly included in mother tongue and literature, art, music, physical education, crafts and home economics. Digital competence, learning to learn, sense of initiative and entrepreneurship belong to the aims of all subjects and cross-curricular themes.

Singapore

The desired outcomes (the four corners of Figure 1 below) for every student are:

- *a confident person*
- *a self-directed learner*
- *an active contributor*
- *a concerned citizen*⁷.

The middle ring contains the «Social and Emotional Competencies», «skills necessary for children to recognise and manage their emotions, develop care and concern for others, make responsible decisions, establish positive relationships, as well as to handle challenging situations effectively». The outerring of the framework represents the 21st century skills necessary for the globalised world. The Ministry says that they need to strike a better balance between learning content knowledge and the acquisition of the necessary competencies and values to thrive in the future. They plan to develop teacher capacity to deliver these 21st century competencies and from 2012 all students will have an «individual Holistic Development Profile», which will record progress in developing these competencies.

⁷ In England: «successful learners, confident individual and confident citizens»; in Scotland: «responsible citizens, effective contributors, confident individuals and successful learners»; in Northern Ireland: «individual; a contributor to society; and a contributor to the economy and the environment».

Figure 1 Singapore target skills and values



Republic of Korea

The Seventh Curriculum introduced on December 30 2007 attempts to «break away from the spoon-fed and short-sighted approach to education of the past» (Ministry website) to produce students who are capable of facing new challenges. Subject content has been reduced and curricula which accommodate the different needs of individual students introduced. Independent learning activities to enhance self-directed learning have been introduced or expanded. The Seventh Curriculum defines an educated person as follows:

- *A person who seeks individuality as the basis for the growth of the whole personality.*
- *A person who exhibits a capacity for fundamental creativity.*
- *A person who pioneers a career path within the wide spectrum of culture.*
- *A person who creates new values on the basis of understanding the national culture.*
- *A person who contributes to the development of the community on the basis of democratic civil consciousness.*

2.8 Howard Gardner: Five minds for the future

In his book, «5 Minds for the Future» (2006) the 5 minds described by Gardner areas follows (the comments in brackets are paraphrased from his Preface to the paperback edition, 2008):

1. The Disciplined Mind (individuals need to be expert in at least one area/discipline).

2. The Synthesising Mind (the ability to gather disparate information, reassemble it to make it accessible and communicate it to others).
3. The Creating Mind («thinking outside the box»).
4. The Respectful Mind (respect for similarities and differences).
5. The Ethical Mind (*thinking beyond our self-interest as workers and citizens*).

He points out that existing models of learning are/were reasonably good for developing a disciplined mind, but neglect the synthesizing mind, although it is perhaps the most important mind for the 21st century. Current ways of thinking and teaching are excellent at «squashing the creative mind». The last two kinds of mind (respectful and ethical) are, according to Gardner, generally considered beyond the remit of theories of learning. There are clear connections here to the quotation from the quotation by Andreas Schleicher at the start of this article.

2.9 Sir Michael Barber, «The prospects for global education reform»: E (K+T+L)⁸

Now Expert Partner in McKinsey's Global Public Sector Practice and head of its Global Education Practice, Sir Michael Barber was formerly Chief Adviser on Delivery (sic) to Tony Blair. He summarises the curriculum of the future in a four letter «equation»:

E (K+T+L)

The K stands for knowledge, but «actually knowledge on its own isn't power at all. Knowledge plus Thinking, **K + T**, may be closer to power if you've got knowledge and you can think about it and apply it in new situations». **L** is leadership, i.e. the ability to exercise influence. E stands for the ethical underpinning of the knowledge and the ability to think and the ability to lead. Again this links back to Gardner and Schleicher.

2.10 Integration of 21st century competencies into existing educational systems

The 2008 Asian-Pacific Economic Cooperation (APEC) Education Reform Symposium in Xi'an reached the following conclusions on action needed to develop 21st century competencies:

- *clear standards for the knowledge, skills and attitudes that students should acquire at each grade/level;*
- *teacher professional development which includes training in teaching key competencies;*
- *policies which support schools in prioritising these competencies;*
- *new ways of measuring mastery of these competencies and the links to success in tertiary education, the labour market and beyond;*
- *resources and tools to facilitate integration.*

⁸ US College of Teachers' Awards Ceremony on 18 May 2010, The College of Teachers' Biennial Lecture, «The prospects for global education reform».

2.11 McKinsey Reports of 2007 and 2010

McKinsey (Sir Michael Barber was in the writing team for both) has published two reports on the characteristics of the «best» school systems (as defined by PISA performance):

1 How the world's best-performing school systems come out on top (September 2007 and 2 How the world's most improved school systems keep getting better (2010).

For the first report McKinsey's team studied 25 of the world's school systems, including 10 of the best performers. They concluded that the experience of the top school systems suggest that three things matter most, each firmly focused on teaching quality and delivery quality:

- *Getting the right people to become teachers («the quality of an education system cannot exceed the quality of its teachers»).*
- *Developing them into effective instructors («the only way to improve outcomes is to improve instruction»).*
- *Ensuring the system is available to deliver the best possible instruction for every child («the only way for the system to reach the highest performance is to raise the standard of every student»).*

This is where the quotation at the start of this article comes in.

In the 2010 report, McKinsey analysed 20 systems⁹ from around the world, all with improving but differing levels of performance, examining how each has achieved significant, sustained, and widespread gains in student outcomes, as measured by international and national assessments. Improving system performance (they found) ultimately comes down to improving the learning experience of students in their classrooms.

School systems do three things to achieve this: they change their **structure** by establishing new institutions or school types, altering school years and levels, or decentralizing system responsibilities; they reallocate **resources** by adding more education staff to schools or by increasing funding; and, they change their **processes** by modifying the curriculum and improving the way that teachers teach and principals lead. Public debate often focuses on structure and resources but most interventions made by improving systems are «process» in nature; and, improving systems generally focus more on improving how teaching is delivered than on changing the content of what is delivered.

McKinsey's research suggests that six interventions are common to all stage in the «improvement journey»:

- *building the teaching skill soft teachers and management skills of principals, assessing students;*
- *improving data systems;*
- *facilitating improvement through policy documents and education laws;*

⁹Armenia, Aspire (a US charter school system), Boston(Massachusetts), Chile, England, Ghana, Hong Kong, Jordan, Latvia, Lithuania, Long Beach(California), Madhya Pradesh (India), Minas Gerais (Brazil), Ontario (Canada), Poland, Saxony (Germany), Singapore, Slovenia, South Korea, and Western Cape (South Africa).

- *revising standards and curriculum;*
- *ensuring an appropriate reward structure for teachers and principals.*

Reform is typically triggered by «a socio-economic crisis; a high profile, critical report of system performance; or a change in leadership». In 15 of the 20 systems studied, two or more of these were present prior to the start of the reform process. The most common event to generate reform is a change in leadership: every system studied relied upon the presence and energy of a new leader, political or strategic, to start the reforms (see my reference to the Coalition Government's proposed reforms in the UK above). Leadership continuity is essential, not on lyin starting reform, but in sustaining it.

3. Education project experience in Ukraine and Kosovo

Project realities are different and somehow separate, despite the fact that they should build on best international/national/donor practice: Terms of Reference (ToR) are dictated by the donor and reflect the donor's «agenda» plus, it is hoped, the needs and expectations of beneficiaries. Sadly they don't always translate into direct improvements for students and teachers.

The EU-funded Ukraine Civic Education project (2005-8), of which I was Team Leader, had as its overall objective (ToR) to «introduce civic education as a «mandatory training» (sic) in secondary schools in Ukraine». However, meetings with the Ministry of Education and other stakeholders during the inception phase confirmed that civic education would remain an optional subject for the foreseeable future. Thus a more pragmatic objective was substituted, to reflect the Ministry's preference for the «institutionalization» of civic education in all schools by raising the awareness of all subject teachers and the provision of training and guidance in how they could contribute to the development of CE competencies across the curriculum. The Curriculum Development Working Group accordingly developed the concept of civic education competencies and a table of target competencies for each stage of education, based on an analysis of national normative documents and presented in terms of what a student should know about, be able to do and what attitudes, vales and skills they should have. The table has subsequently been included in the *Human Rights Education in the School Systems of Europe, Central Asia and North America: A Compendium of Good Practice* (OSCE, 2009).

Kosovo is one of Europe's poorest and most complex multi-ethnic countries. It unilaterally declared independence from Serbia in February 2008. Some 90% of the country's 2m people are Albanians; at least half of the remaining 200,000 are Serbs. The biggest minority after that are Bosniaks (i.e. Bosnian Muslims). Then come Roma, some of whom are called Ashkali and some Egyptians; Turks; Gorani; and, finally, a small number of Croats.

The Project ToR for **the EU-funded *Education Sector wide Approach Project*** (Kosovo, 2009-12) anticipated greater involvement of the Project team in the curriculum framework development process, but this had instead already been supported by UNICEF/UNESCO by the time the project started so the project's focus switched to support to implementation and the subject syllabus development process.

However, as a result of the external support the Kosovo Curriculum Framework (KCF) had become very ambitious and challenging with EU-based key competencies (reduced to six from the eight quoted earlier) and six learning areas, plus cross-curricular themes and dimensions *and* including, for the first time, the teaching of integrated science and integrated humanities (for which there is no pre-service or in-service training programme) and the introduction of English from Grade 1 (not to mention a new compulsory pre-primary Grade 0).

The key competencies envisaged for the Kosovo education system (with target outcomes in brackets) are: *communication and expression competencies (effective communicator)*; *thinking competencies (creative thinker)*; *learning competencies (successful learner)*; *life-, work-, and environment-related competencies (productive contributor)*; *personal competencies (healthy individual)*; *civic competencies (responsible citizen)*.

The KCF defined a competency as «a broad capacity to apply knowledge, skills, attitudes, routines, values and emotions in independent, practical and meaningful ways» and curriculum is organised around the «concept of providing children with the required skills, attitudes and knowledge to perform the tasks that society and educationalist consider that they will need for their time at school and for the rest of their lives as students, employees, family members and as part of the society of Kosovo».

The key competencies in the KCF are expressed through learning outcomes: statements describing what students should know, believe, value and be able to do. Outcomes are expressed in a range of domains, including knowledge, understanding, skills and competencies, values and attitudes.

In the KCF, the key competencies are reflected through general «key learning outcomes» which summarise what learners will achieve by the end of compulsory education, i.e. Grade 12. In the Core Curriculum, the key competencies are reflected in more specific «core learning outcomes» which summarise what learners will achieve by the end of each curriculum stage, and in each learning area. In the subject syllabi, the key competencies are reflected in specific subject-based and topic-based learning outcomes: what learners will achieve by the end of each grade by subject and topic within the subjects.

The KCF is based on six broad learning areas that are continue from Early Childhood Education (ECE) to upper secondary education (Grade 12) and are common to both general and vocational education:

- *Communication and expression;*
- *Mathematics;*
- *Sciences;*
- *Society and environment;*
- *Health and wellbeing;*
- *Life and work.*

In addition, a number of cross-cutting issues and dimensions are integrated throughout the curriculum:

Education for democratic citizenship and human rights; education for peace and tolerance; personal development and life skills; education for sustainable

development; gender equality; intercultural education; media education/literacy; health education, including sex education; ICT education/literacy and e-learning; career awareness; preparation for life and work; economic awareness; financial literacy; entrepreneurial education; language and communication skills across the curriculum.

Cross-cutting issues are integrated in the curriculum through appropriate themes and lesson units as well as appropriate classroom practices (such as group work, project work, community service), and integrated topics for assessment.

Table 1. Kosovo key competencies and learner outcomes

Six key competencies	Final outcomes
<p>1. Communication and expression competency</p> <ul style="list-style-type: none"> ➤ To communicate and express oneself through languages, symbols, signs and artistic codes ➤ To engage and contribute in productive dialogue ➤ To follow rules and be creative. <p>2. Thinking competency</p> <ul style="list-style-type: none"> ➤ To learn, understand, analyze, judge, synthesize ➤ To develop abstract thinking ➤ To make informed decisions ➤ To link decisions with consequences ➤ To evaluate /self-evaluate ➤ To solve problems <p>3. Learning competency</p> <ul style="list-style-type: none"> ➤ To demonstrate capacity in literacy, mathematics, sciences, information and communication technology and citizenship ➤ To learn how to learn ➤ To identify and process information independently, effectively and responsibly <p>4. Life, work, and environment-related competency</p> <ul style="list-style-type: none"> ➤ team work skills ➤ organizational and leadership skills ➤ entrepreneurial skills ➤ conflict management, risk assessment ➤ independent and responsible actions 	<p>1. Effective communicator</p> <p>2. Creative thinker</p> <p>3. Successful learners</p> <p>4. Productive contributor</p>

<p>➤ active in environment protection and development</p> <p>5. Personal competency</p> <ul style="list-style-type: none"> ➤ to know oneself and others ➤ to demonstrate self-confidence ➤ to manage emotions and stress ➤ empathy for and with others ➤ to demonstrate ability for healthy lifestyle ➤ to make responsible choices for health, diet and exercise. <p>6. Civic competency</p> <ul style="list-style-type: none"> ➤ to manage diversity constructively ➤ to demonstrate tolerance and respect ➤ to demonstrate responsibility and civic participation ➤ to undertake initiatives for changes in society and environment 	<p>5. Healthy individual</p> <p>6. Responsible citizen</p>
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The new Kosovo curriculum is a complex system of curriculum documents and underlying implementation arrangements that encompass the expectations of current-day Kosovo society and its ever growing young population. Effective implementation requires at least the following:

- good quality curriculum documents;
- a school system fully prepared to absorb the curriculum change by means of enhanced institutional capacities and human resources;
- management and teaching staff trained in curriculum implementation and able to access continuous professional development in understanding and practicing the new curriculum in every-day classroom activities.

The curriculum development process needs to be clear to all stakeholders: Ministry, local authorities, teacher training providers, schools, international donors, students, principals, teachers, parents, disadvantaged groups and society at large.

The Project Team strongly believed that it was extremely unlikely that the KCF could be successfully implemented as currently scheduled because of the lack of capacity to support the implementation process and proposed a delay. The major obstacle was/is inadequate teacher and teacher training capacity and the lack of engagement of the main potential provider (the University Faculty of Education), in terms of either pre-service or in-service provision, and would need a substantial staff development programme to meet the needs of the KCF. The main capacity building focus would need to be on teacher training, but also training providers, Ministry of Education staff responsible for assessment and examinations, quality assurance, curriculum, teacher training and inspection, as well as regional education departments and school directors.

4. The shape of schools to come?

4.1 21st-century schools.

Table 2 below is taken from the 21st Century Schools website, an independent US company specialising in professional staff development and curriculum design. One of its goals is to help students become «iKids» and truly global citizens. It describes today's students «digital natives», and today's teachers as «digital immigrants», working with students whose entire lives have been immersed in the 21st century media culture. Today's students are digital learners. They offer new definitions for «school», «teacher» and learner' appropriate for the 21st century:

Schools: «nerve centers, with walls that are porous and transparent, connecting teachers, students and the community to the wealth of knowledge that exists in the world».

Teachers: «orchestrators of learning» not «dispensers of information»; help students «turn information into knowledge, and knowledge into wisdom».

Learners: taught flexibly; see how learning prepares them for life in the real world; have the curiosity fundamental to lifelong learning; continue to learn outside the formal school day.

Table 2. 20th century classroom v. the 21st century classroom¹⁰

Time-based	Outcome-based
Focus: memorization of discrete facts	Focus: what students know, can do
Lessons focus on the lower level of Bloom's Taxonomy: knowledge, comprehension and application.	Learning is designed on upper levels of Bloom's Taxonomy: synthesis, analysis and evaluation
Textbook-driven	Research-driven
Passive learning	Active learning
Learners work in isolation – classroom within four walls	Learners work collaboratively with classmates and others around the world – the global classroom
Teacher-centered: teacher is centre of attention and provider of information	Student-centered: teacher is facilitator/coach
Little to no student freedom	Great deal of student freedom
Discipline problems:– educators do not trust students and vice versa. No student motivation.	No discipline problems: students and teachers have mutually respectful relationship as co-learners; students are highly motivated.
Fragmented curriculum	Integrated and interdisciplinary curriculum

¹⁰http://www.21stcenturyschools.com/What_is_21st_Century_Education.htm

Grades averaged	Grades based on what was learned
Low expectations	High expectations: we expect/ensure that all students succeed at high level. Some may go higher: we get out of their way.
Teacher is judge. No one else sees student work.	Self, peer and other assessments. Public audience, authentic assessments.
Curriculum/school is irrelevant and meaningless to the students.	Curriculum is connected to students' interests, experiences, talents and the real world.
Print is the primary vehicle of learning and assessment.	Performances, projects and multiple forms of media are used for learning and assessment
Diversity in students is ignored.	Curriculum/teaching address student diversity
Literacy is the 3 Rs – reading, writing and maths	Multiple literacies of the 21 st century – aligned to living and working in a global new millennium.
Factory model, based on needs of employers of the 19th century. Scientific management.	Global model, based upon the needs of a globalized, high-tech society.
Driven by standardised testing.	Standardised testing has its place.

What is a 21st-century curriculum (from the same website)?

- interdisciplinary, project-based, and research-driven;
- connected to the community: local, regional, national and global;
- incorporates higher order thinking skills, multiple intelligences, technology and multimedia, the multiple literacies of the 21st century, and authentic assessments;
- expanded classroom to include the greater community;
- students are self-directed, and work independently and interdependently;
- curriculum and teaching designed to challenge all students, and provide for differentiation; not textbook-driven or fragmented, but thematic, project-based and integrated;
 - skills and content are not taught as an end in themselves; students learn through their research and their projects;
 - textbooks are just one of many resources;
 - knowledge is not memorization of facts and figures, but constructed through research and application, connected to previous knowledge, personal experience, interests, talents and passions;
 - assessment moves from regurgitation of memorized facts and disconnected processes to demonstration of understanding in a variety of contexts;
 - real-world audiences are an important part of the assessment process, as is self-assessment.

4.2 Royal Society of Arts (RSA) Opening Minds?

Opening Minds (OM) is now being used in over 200 English schools: teachers design and develop a curriculum for their own school based on the development of five key competences:

1. Citizenship
2. Learning
3. Managing information
4. Relating to people
5. Managing situations.

The OM competences are broad areas of capability, developed in classrooms through a mixture of instruction and practical experience: children plan their work, organise their own time and explore their own ways of learning. Subject boundaries are less defined than in traditional curriculum teaching, with schools often integrating the teaching of several subjects together into modules or topics, where competences can be developed through the exploration of common themes. The input of teachers and the individual needs of schools are central to the planning of each OM project.

The five key competences break down into a detailed structure of individual competences, expressed in terms of what a student can achieve having progressed through the curriculum:

Competences for citizenship

- Morals and ethics: students develop an understanding of ethics and values, how personal behaviour should be informed by these and how to contribute to society.
- Making a difference: students understand how society, government and business work, and the importance of active citizenship.
- Diversity: students understand and value social, cultural and community diversity, in both national and global contexts.
- Technological impact: students understand the social implications of technology.
- Self-reliance: students develop an understanding of how to manage aspects of their own lives and the techniques they might use to do so, including managing their financial affairs.

Competences for learning

- Learning styles: students understand different ways of learning and how to develop and assess their effectiveness as learners.
- Reasoning: students learn to think originally and systematically and how to apply this knowledge.
- Creativity: students explore and understand their own abilities and creative talents, and how best to make use of them.
- Positive motivation: students learn to enjoy and love learning for its own sake and as part of understanding themselves.
- Key skills: students achieve high standards in literacy, numeracy, and spatial understanding.

➤ ICT skills: students achieve high standards of competence in handling information and communications technology and understand the underlying processes.

Competences for managing information

- Research: students develop a range of techniques for accessing, evaluating and differentiating information and have learned how to analyse, synthesise and apply it.
- Reflection: students understand the importance of reflecting and applying critical judgement and learn how to do so.

Competences for relating to people

- Leadership: students understand how to relate to other people in varying contexts in which they might find themselves, including those where they manage, or are managed by, others; and how to get things done.
- Teamwork: students understand how to operate in teams and their own capacities for filling different team roles.
- Coaching: students understand how to develop other people, whether as peer or teacher.
- Communication: students develop a range of techniques for communicating by different means, and understand how and when to use them.
- Emotional intelligence: students develop competence in managing personal and emotional relationships.
- Stress management: students understand and are able to use varying means of managing stress and conflict.

Competences for managing situations

- Time management: students understand the importance of managing their own time, and develop preferred techniques for doing so.
- Coping with change: students understand what is meant by managing change, and develop a range of techniques for use in varying situations.

Opening Minds (OM) is being implemented in many school types and across a range of student abilities, year groups and subject areas; curricula differ between schools, but they share a number of characteristics in terms of teaching, learning and assessment:

- OM is at the heart of the school's strategy;
- OM helps improve subject knowledge and skills development;
- a mixture of self, peer and teacher assessment is used;
- curriculum is relevant to the school context and pupils needs;
- reflective practice and action research used to further develop and improve the content and delivery of OM;
- teachers' professional learning and development is central to valuing the development, delivery and review of the curriculum;

- the value of competence development is emphasised and understood by all members of the school community;
- student reflection on their learning is encouraged and student insights inform best practice;
- staff encouraged to work collaboratively across subject areas;
- flexible use of space and time;
- wide range of teaching and learning approaches.

OM supports the aims of the English National Curriculum but enables schools to deliver the content in a creative and flexible way; it is not an alternative to the teaching of subject knowledge but an alternative way of delivering it. The OM competence framework is consistent with the PLTS framework mentioned in Section 1.1 above. Competences are not only skills or behaviours, but also incorporate young people's capabilities and understanding. Opening Minds is not a set of learning objectives to be integrated into an existing curriculum, rather it is a framework for the whole school curriculum and requires a different way of teaching.

4.2 The School of One

«Today's schools are an anachronism» says Neil O'Brien, Director of Policy Exchange in his blog (*Daily Telegraph*, 22 April 2011). «They resemble the assembly lines of the industrial era, when they were conceived. Groups of 25 to 30 children, beginning at age five, are moved through 13 years of schooling, attending 180 days each year, and taking five major subjects daily for lengths of time specified by the Carnegie Foundation in 1910. These schools are time-based – all children are expected to master the same studies at the same rate over the same period of time. They focus on teaching – how long students are exposed to instruction, not how much they have learned. They are rooted in the belief that one size fits all—all students can benefit equally from the same curriculum and methods of instruction».

School systems need to focus now on learning, and of different subjects at different rates, on children's different learning styles, plus what new technologies can offer in terms of individualising/personalising education for every child. «Our schools will shift their attention from teaching to learning, time-based to outcome-based education, and mass instruction to individualized instruction».

He quotes as an example of technology-based innovation, the «School of One» experimental programme in New York, which uses technology to create personalised «playlists» of lessons, aimed at the exact level each child has reached. At the end of each day, pupils take a short online test, to measure how much progress they have made, before a programme works out what they need to be studying the next day. A typical playlist might tell a pupil to start the day by meeting a teacher, then completing a set of online tasks, and then carrying out a project with a group of other children. Thus, instead of a «stream» of 25 children, there is stream of one – hence the name of the programme.

The children do a mix of whole-class, group work and individual tasks, so there is still a personal relationship with teachers and classmates. Teachers can also monitor very closely how well their pupils are doing, and push them along appropriately. The technology also gives children more personal feedback than they

would otherwise get in the conventional classroom. Pupils can also access remote lessons from specialists, or watch lectures from all over the world (the expert approach to teaching mentioned the *Guardian* children's survey in Section 1 above).

«Technology-powered schooling» would also change expectations about the number of potential high achievers in schools in contrast to what O'Brien calls «an anti-achievement culture», referring to the recent Policy Exchange report about the UK system quoted in Section 1, where «targets and league tables have distorted priorities, leading schools to focus on pushing pupils over the boundary of a C-grade at GCSE and leaving bright pupils neglected».

5. A final word about (e)quality of education

I haven't said much about quality so far. PISA and McKinsey talk about «successful schools» and systems and the Executive Summary to the PISA 2009 results identifies some features of what makes a school «successful», in terms of policies, resources and practices:

➤ Students who had attended pre-primary school tend to perform better than students who have not (this applies to 94% of 15-year-olds in OECD countries).

➤ Successful school systems provide all students, regardless of their socio-economic backgrounds, with similar opportunities to learn.

➤ In countries where more students repeat grades, overall results tend to be worse.

➤ In countries where schools have greater autonomy over what is taught and how students are assessed, students tend to perform better.

➤ In countries where schools are publicly held to account for their results, schools that enjoy greater autonomy in resource allocation tend to do better. In countries where there are no such accountability arrangements, the reverse is true.

➤ Countries that create a more competitive environment in which many schools compete for students do not systematically produce better results.

➤ School systems considered successful tend to prioritise teachers' pay over smaller classes.

➤ Schools with better disciplinary climates, more positive behaviour among teachers and better teacher-student relations tend to achieve higher scores in reading

Interestingly, and sadly, the last set of results also show that 28% of students in OECD countries are in schools whose principals say that their teaching staff's resistance to change negatively affects students; 23% attend schools whose principals report that students are not encouraged by teachers; 22% attend schools whose principals believe that learning is hindered by low teacher expectations; and 17% of students attend schools whose principals say that teacher absenteeism hampers learning).

The European Report on the Quality of School Education (May 2000) identified five challenges and sixteen quality indicators as summarised below:

➤ the knowledge challenge (refers to the information explosion and the need to rethink traditional conceptions of knowledge, its «transmission», «delivery» by teachers and «acquisition» by students);

- the challenge of decentralisation (more autonomy and responsibility for schools and increasing demands for accountability);
- the resource challenge (education as investment; cost-effective alternatives to expensive institutional practices);
- the challenge of social inclusion (to offer all children and young people the opportunity to benefit from school education and to prepare them for life after school);
- the challenge of data and comparability (benchmarking - a new way of thinking about national performance, local and regional effectiveness, and school performance; benchmarks used diagnostically to inform policy and practice).

The sixteen indicators relate to four areas:

- **attainment:** in mathematics, reading, science, information and communication technologies (ICT), foreign languages, learning to learn, and civics;
- **success and transition:** pupils' ability to complete their studies by examining dropout rates, completion of upper secondary education and participation in higher education;
- **monitoring of school education:** the level of participation of the various stakeholders in school systems through evaluation and steering of school education and evaluation of parental participation;
- **resources and structures:** educational expenditure per student, education and training of teachers, rate of *participation in pre-primary education and the number of students per computer*.

The **Education for All** sixth Goal is «*Improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills*» and places quality at the heart of education. A quality education is «one that satisfies basic learning needs and enriches the lives of learners and their overall experience of living». Successful education programmes, according to UNESCO, require:

(1) healthy, well-nourished and motivated students; (2) well-trained teachers and active learning techniques; (3) adequate facilities and learning materials; (4) a relevant curriculum that can be taught and learned in a local language and builds upon the knowledge and experience of the teachers and learners; (5) an environment that not only encourages learning but is welcoming, gender-sensitive, healthy and safe; (6) a clear definition and accurate assessment of learning outcomes, including knowledge, skills, attitudes and values; (7) participatory governance and management; (8) respect for and engagement with local communities and cultures.

5 Conclusions

- 21st-century students are constrained by 20th-century teachers in a 19th-century system.
- There is broad agreement on the need for 21st-century competencies and for «survival» and «employability» skills: to meet unforeseen future challenges requires versatility, the ability extrapolate.

- 21st-century competencies need 21st-century support systems and teaching and learning «spaces» and resources.
- 21st-century competencies embrace skills, attitudes, values.
- There is less attention so far to assessment and teacher development programmes for these competencies.
- The ethical, respectful and leadership aspects are particularly important, but harder to measure.
- PISA results are becoming increasingly important as a driver for change and reform both for «successful» and aspiring education systems and for both OECD and associate countries; the «achievement gap» is expensive (investment in education for GDP?).
- Successful systems prioritise school autonomy and accountability, teaching and delivery quality, well-rewarded teachers, even at the expense of class sizes, and raising standards for **all** students.
- Education projects operate on a different basis, driven by donor agendas.

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Девід Ройл

Якісна середня освіта, заснована на компетентісному підході: питання та труднощі

Так звані компетенції студентів 21 століття активно обговорюються вже протягом декількох років. Цьому сприяє зростаюча цікавість до результатів PISA та їхня порівняльна цінність для освітніх систем, що мають на меті покращення та підвищення своєї ефективності. Однак мені зрозумілим є те, що шкільні системи мають охоплювати й такий спосіб досягнення поставлених за мету компетенцій, як, наприклад, внесення необхідних змін до програм професійної підготовки вчителів.

Девид Ройл

Качественное среднее образование, основанное на компетентностном подходе: вопросы и трудности

Так называемые компетенции студентов 21 века активно обсуждаются уже в течение нескольких лет. Этому способствует повышенный интерес к результатам PISA и их сравнительная ценность для образовательных систем, целью которых есть повышение своей эффективности. Однако менее понятным является то, что школьные системы должны принимать во внимание и такой способ достижения таких целевых компетентностей, как, например, внесение необходимых изменений в программы профессиональной подготовки учителей.