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# Redefining high performance in Northern Ireland: Deeper learning and twenty-first century skills meet high stakes accountability

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**Abstract**    This study examined four secondary schools in Northern Ireland serving a significant percentage of low income families: two schools from the 'Maintained' (de-facto Catholic) sector, one school from the 'Controlled' (de-facto Protestant) sector, and one school from the 'Integrated' (mixed faith) sector. The objective was to identify when and how the schools fostered higher level cognitive skills, interpersonal skills and intrapersonal skills, known collectively in the literature as twenty-first century learning. This paper focuses on the Integrated school *as representative of many of the attributes encountered in all four schools* and as a particular exemplar of high performance. The selected school served 28 % low income families, consistently outperformed demographic peers on required exams for the General Certificate of Secondary Education, and revealed through inspection reports and professional reputation a school wide commitment to instruction of twenty-first century skills. Analysis of classroom observations and focus group interviews with students, teachers, and administrators revealed that (1) Twenty-first century task demand is *relatively higher* when student learning is assessed with portfolios, performances, and local assessment practices, *and* twenty-first century task demand is *relatively lower* when learning is assessed with external exams. (2) Pastoral care, thoughtfully deployed, is a powerful lever for twenty-first century learning. (3) Cross-community contact, developed in meaningful ways, is a potentially powerful lever not only for peace-building in the province, but high level learning for the province's youth. (4) The School fostered twenty-first century skills by advancing a vision for learning that extends well beyond the low level demand of state accountability metrics. Recommendations for policy and practice are offered.

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## Introduction

National and provincial policies governing primary and secondary education within OECD nations increasingly demand that schools prepare students for externally imposed standardized exams. Such exams tend to measure low level cognitive skills such as recall, procedural thinking and analysis. At the same time, national and provincial policies are also insisting that schools teach higher level skills known in the literature as twenty-first century knowledge. There are, however, few, if any, state administered metrics of twenty-first century knowledge. Consequently, there is little real policy-based incentive or pressure for schools to teach twenty-first century knowledge. A large body of evidence now exists demonstrating that the demand for standardized test performance biases practitioners toward shallow ("test prep") instruction focused on memorization and procedural skills. Research shows further that this bias is particularly strong for schools serving marginalized children and youth. At the same time, the twin policy demand for twenty-first century knowledge requires schools to focus on deeper level instruction in the cognitive, interpersonal, and intrapersonal domains. Thus, for school level practitioners, especially those serving marginalized youth, these demands stand in conflict with one another (Schoen and Fusarelli 2008).

This paper reports on data collected as part of a larger international study of secondary schools. Focusing on how schools respond to the twin policy demands for test performance and twenty-first century learning of many economically developed democracies, we designed a multi-year project to identify and study outlier schools that serve marginalized children and youth and that show promise *in meeting both policy demands simultaneously* in the US, UK, and Israel where a history of deep educational inequality is rooted in differences related to race, class, sectarianism, language, nationality, and/or immigration. For the purposes of this paper, we share findings from one case study of a secondary school in Northern Ireland, a UK province with a particularly pronounced history of educational inequality.

## The Northern Ireland context

The main government agency for educational standards in Northern Ireland [NI] is the Department of Education of Northern Ireland (DENI). In the primary school sector the main measure of educational achievement are pupil outcomes in literacy and numeracy at key stage 2 (age 11).[1] Pupil outcomes are based on teacher assessment and the figures show that, in general, there are fairly high levels of achievement. In 2006/07, 78 % of pupils were performing at or above the expected

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[1] The four paragraphs leading this section were prepared by Martin Hagan, Principal Lecturer and Chair of the Education Studies Team at St. Mary's University College, Belfast.

level in literacy and 79.5 % were achieving at or above the expected levels in mathematics (DENI 2009). By the same token, these figures also show that around one-fifth of pupils do not manage to reach the expected standards by the end of the primary school phase. As such, this does not provide a good platform for development as these pupils move into their post-primary education.

Post-primary education in NI is characterised by a two track approach with academic selection at the age of 11. Though the state no longer oversees or officially endorses an academic selection process, schools and families continue to engage in this process quite vigorously on their own. The top 27 % of pupils progress to what are perceived as the elite Grammar school sector and the rest of the cohort move into what is termed the Secondary sector. (There is a trend of rising enrollment in the grammar schools). The main measures of achievement in the post-primary sector are the General Certificate in Secondary Education (GCSE) and Advanced Level (A level) examinations. These are public examinations which are taken in the United Kingdom (UK) at the post-primary stage at ages 16 and 18 respectively. Schools in NI outperform their counterparts in England and Wales, showing that 98 % of year 14 pupils (age 18) achieved 2 or more A levels (or equivalent) at grade A–E and 60 % of year 12 (age 16) pupils achieved 5 or more GCSEs at grade A*–C including English and Mathematics, in a recent representative year, 2011–2012 (DENI 2013). These achievements should not be underestimated and it is generally recognised that success in these examinations paves the way to further and higher education and employment.

This positive picture, however, is not reflected in all school contexts as there are still a significant number of pupils who do not manage to achieve these recognised standards. In 2011–2012, for example, nearly a fourth (22 %) of pupils did not achieve the desired success measure of 5+ GCSEs at grade A*–C. When this criterion is broadened to focus on 5 or more GCSEs at grade A*–C including English and Mathematics, the figure not achieving this standard was actually 40 % (DENI 2013) This high level of underachievement becomes even more significant when it is layered onto the socio-economic status of the underachieving pupils in question. The relationship between educational attainment and social disadvantage is clear (Cox 2000) and in the case of NI, the selective system has been highlighted as a significant factor in the enhancement of class inequality and educational disadvantage (Gallagher and Smith 2000). Gallagher and Smith (2000) have shown that the selective structure tends to reflect the socio-economic divisions in society, in that children from more advantaged backgrounds have a greater chance of obtaining a place in grammar schools while those from less advantaged circumstances are more likely to be found in secondary schools. The phenomenon applies across both sides of the traditional, religious 'two communities' divide i.e. for the Controlled (de facto Protestant) and Maintained (de facto Catholic) sectors respectively.

For example, in the academic year 2011–2012, non-grammar schools serving 0–19.99 % of students eligible for free school meals, showed an average of 38.4 % of all students leaving school with at least 5 GCSEs at grade A*–C including English and Maths in the year 2011–2012. By comparison, non-grammar schools with 50 % or more students eligible for free school meals showed an average of 18 % (DENI 2013). In addition to this, there is significant variation across schools

and localities which points to the fact that different schools can produce significantly different outcomes, regardless of similar levels of disadvantage.

In assessing the overall quality of education in NI, outcome comparisons are usually made with pupils in England and Wales. In general, these comparisons show the NI education system to be working well in comparison to that of its closest neighbours. In addition, NI participates in the Programme for International Student Achievement (PISA) which allows a comparison of outcomes at the age of 15 with 56 other nations including EU and OECD members. A recent survey (OECD 2009) shows that the NI ranking has declined in recent years to the point where NI outcomes currently reflect average OECD attainment both in English and Mathematics as opposed to significantly higher levels as measured in 2003. In science, NI has maintained an above average position since 2003, but other countries have managed to improve their rankings above the NI position.

## Protestant youth from low income families in Northern Ireland

There are strong indications from existing research that protestant youth from low income families are, as a class, underachieving when compared to the norm for the province of Northern Ireland and all youth from similar family income levels. In the data analysis for the present study, controlled sector schools sharply underperformed similar maintained and integrated schools. For schools with a population of pupils eligible for free school meals of at least 25 %, there was no controlled sector school that met the threshold for inclusion in this study. That threshold was GCSE scores at least one standard deviation above the mean for like-schools (Details in section below). Ranking all 76 schools in this study's preliminary pool from top to bottom, the highest-ranking controlled school stood in 27th place. Further evidence of a pattern of underachievement comes from a study conducted by the University of Ulster, published in 2001, showing that participation rates in further and higher education among protestant boys, in particular, was well below average (Collins et al. 2001).

What might explain this phenomenon? A report issued by a working group led by MLA Dawn Purvis in 2011, found the following patterns within the protestant community of Northern Ireland which help explain educational underachievement:

> Given the historic predominance of trades and apprenticeships, educational attainment via schools, colleges and universities had not been prioritised among this section of Northern Ireland's working class in the manner required to respond to new 'flexible', less regulated, labour markets driven by educational qualifications and skills tied to computerization and portable learning. The collapse of established, long-term inter-generational labour markets led to some aiming for new skills but many merely feeling 'out of sync' with contemporary requirements. For the latter group, the traditional labour market was replaced by social fatalism, low wage employment, insecure casualised work, feminised labour and benefit dependency. Within that group, education remains both under-valued and under-appreciated. (Purvis 2011).

While the controlled sector experiences educational underachievement generally, boys, in particular, underachieve by a wider margin than girls. One report shows the passing rate for girls (42 %) 11 points higher than the passing rate for boys (30.7 %) with 5 GCSEs A*–C, including maths and English (Southeastern Education and Library Board 2013). It is clear then that although the NI education system produces some very good academic outcomes for some pupils, this pattern is not uniform for all. The significant gap between the highest and lowest achieving pupils is also reflective of the social division apparent in society which, in turn perpetuates existing inequality.

## Research context

The current study locates itself at the intersection of three streams of research including. (1) research in the area of *deeper learning* and the emerging construct of twenty-first century knowledge; (2) research into the impact of test-based accountability on instructional practice and student learning; and (3) research in the area of school level traits associated with academic high performance.

## Deeper learning and the emergence of the twenty-first century skills construct

Since the early 1990s labor economists have theorized the emergence of a skill set associated with a growing number of jobs in the US and international labor markets, resulting from economic globalization and advancing digital technology. "What Work Requires of Schools," a report of the United States Department of Labor's Commission on Achieving Necessary Skills (1991), may be the first major report identifying a skill set which has been reiterated with strikingly little variation by policy reports in the decades since. More recently, The Partnership for twenty-first Century skills, the International Society for Technology in Education and the North Central Regional Educational Laboratory have each published schema outlining twenty-first century skills. The rationales driving the major "twenty-first century skill" initiatives are quite similar and are summarized well in the early (1991) US Department of Labor report: "the globalization of commerce and industry and the explosive growth of technology on the job." (p. viii).

Though labor economics has been the chief driver of policy activity surrounding twenty-first century skills, some education stakeholders have invoked twenty-first century skills as the essential abilities that foster *civic engagement* in a world that is increasingly complex politically and increasingly connected socially and politically. The William and Flora Hewlett Foundation's "Deeper Learning" Program (www. hewlett.org) is a prominent example, along with scholars Pellegrino and Hilton (2012).

The "twenty-first century skills" construct is emerging as a fairly stable and relatively well accepted policy framework internationally for what students need to know and be able to do to thrive as workers and citizens in a globalized environment (Anandiadou and Claro 2009; Voogt and Roblin 2012). Various terms appear in popular literature, which tend to refer more or less to the same skillset. Pellegrino and

Hilton (2012) list them: "deeper learning," "twenty-first century skills," "college and career readiness," "student-centered learning," "next generation learning," "new basic skills," and "higher-order thinking." In their 2012 report *Education for Life and Work,* the Committee on Defining Deeper Learning and twenty-first century Skills based their definition on the idea of deeper learning as "transfer" or the process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations (Pellegrino and Hilton 2012). Indeed, many scholars argue that the essence of "twenty-first century" learning is not what unit of knowledge students have; rather, it is what students can do with knowledge once they have it (Silva 2008), thereby requiring schools to develop new, more sophisticated approaches to teaching (Rotherham and Willingham 2009).

Arguing that transfer is inextricably intertwined with specific competencies, the Committee organized what they referred to as twenty-first century competencies into three domains. The cognitive domain included critical thinking, information literacy, reasoning and argumentation, and innovation. The intrapersonal domain included intellectual openness, work ethic and conscientiousness, and positive core self-evaluation. The interpersonal domain included teamwork and collaboration and leadership (Pellegrino and Hilton 2012, p. 4). According to the report, twenty-first century competencies are the blend of knowledge and skill that create the capacity in the individual to understand how, why, and when to apply domain specific knowledge to answer questions and solve problems.

Similarly, in their efforts to promote deeper learning and the development of twenty-first century skills in US classrooms, UCLA's National Center for Research on Evaluation, Standards, and Student Testing (CRESST) relied on Webb et. al's (2005) Depth of Knowledge Methodology (DOK) to analyze new assessments (i.e., PARCC and SBAC) of deeper learning. The system categorizes DOK into four levels:

DOK1    Recall of a fact, term, concept, or procedure; basic comprehension
DOK2    Application of concepts and/or procedures involving some mental processing
DOK3    Applications requiring abstract thinking, reasoning, and/or more complex inferences
DOK4    Extended analysis or investigation that requires synthesis and analysis across multiple contexts and non-routine applications

It should be noted that while none of the skills embedded in these varied constructs is new to the twenty-first century, three things *are* new: (1) the technological platform on which so much intellectual activity now occurs, (not, in itself a skill), (2) the increasing percentage of workers required by a globalized, knowledge economy, who must be facile with such skills, and (3) the swelling chorus of actors in the policy world who are calling for their inclusion in primary and secondary education.

There are voices in the academy—and some in the policy world—who deride twenty-first century skills and similar terms. See, for example, blogposts by historian Diane Ravitch (www.dianeravitch.net) and literary critic E.D. Hirsch (www.commoncore.org). Ravitch, Hirsch and others do not criticize the skills per se. They criticize the separation of skills from domain specific knowledge (subject

matter), citing anecdotal evidence from schools that purport to teach "critical thinking" without teaching anything about which to critically think or zealots who argue against teaching "content" because in the digital age one can simply google it on a smart phone.

## Impact of test-based accountability on instructional practice and student learning

"Twenty-first century skills" has become a construct with global currency. However, the penetration of twenty-first century skills into public schools internationally remains weak (Anandiadou and Claro 2009; Voogt and Roblin 2012). A barrier to success, particularly for schools serving marginalized students, is the omnipresence of high stakes, mandated tests across many industrialized nations, which dis-incentivize deeper learning. As the policy world increasingly relies on tests as a public accountability metric, there is growing evidence that schools under pressure for test performance narrow the curriculum and instruction in order to boost scores (McMurrer 2007; Moon et al. 2003; Hinde 2003). In doing so, schools diminish their capacity to foster deeper learning and intensify a learning gap between their students and students of privilege with an increasingly important skill set *that goes largely unmeasured*. Because external accountability currently focuses on test performance, twenty-first century learning in many schools fails to make its way into instructional practice (Schoen and Fusarelli 2008). Schools tend to respond to the call for twenty-first century skills through a vision statement or other types of administrative planning documents, but they rarely respond at the level of practice because there are no assessments that hold them accountable for doing so. The problem is particularly acute in schools serving low Socio-economic status (SES) populations in many OECD nations which are experiencing increasingly intense pressure for improved test performance. Thus, many children, particularly those from low SES groups, may grow up with a dangerously lopsided, inadequate, and unfulfilling education (Kozol 2005). While there is documentation of schools that perform beyond expectation on tests (Carter 2000; Herman et al. 2008; Maden 2001), there is no systematic accounting of schools that *also* place a demonstrable emphasis on twenty-first century learning.

In the US, policymakers hope to promote and systematically account for twenty-first century learning in schools by developing standards and assessments that are in line with this goal. According to Herman and Linn (2013), new assessments coming out of PARCC and SBAC are intended to "address much deeper levels of knowledge, application, communication, and problem solving than do current state assessments" (p. 19). However, the scholars foresee that initial results on these assessments "are likely to provide a shock to the public and to teachers' usual practice" (p. 19). Since the late 1990s, policymakers, practitioners, and scholars in the UK have also engaged in "vociferous debates … around the extent to which education [is] primarily a means of knowledge transfer for achieving success in examinations or whether, in the new 'Information Age' it should focus more on the acquisition of transferable skills for life-long learning" (Colwill and Gallagher 2007). These debates were (and continue to be) driven by a tension between a demand to modernize and prepare students for the future

and a need to determine how education serves a role in promoting values of the past. Curriculum developers in Northern Ireland, who were challenged by a rapidly changing economic and technological landscape, resolved to meet the learning needs of students in the twenty-first century through new curriculum frameworks that emphasized transferable skills and learning for life and work. Colwill and Gallagher (2007) describe these efforts:

> A framework for cross-curricular skills (Communication, Using Mathematics and Using Information and Communication Technology) and a framework for Thinking Skills and Personal Capabilities have replaced the subject-based levels of achievement as a means of describing progression.

According to the researchers, efforts to change curriculum to address the demands of the twenty-first century have done little to impact teaching in secondary schools. While Northern Ireland's curriculum is robust, meaningful implementation will require more systematic efforts to build capacity through professional development and leadership that can influence teachers' willingness to engage in new ways of doing their work. While implementation in both the US and UK is underway for curriculum and large-scale assessments that invoke twenty-first century learning, it remains unclear the extent to which such changes in language are fostering changes in practice.

## School level traits associated with high performance

External curriculum mandates and assessment pressures focusing on the school as the unit of accountability and improvement have prompted research since the 1990s to identify school-level traits associated with high performance. Robust findings now exist which identify the following requisite traits for a high performing school: high cognitive demand across classrooms, high expectations for all students within a classroom, collective responsibility for student learning, collective efficacy, shared instructional norms, collaborative examination of practice, shared vision and purpose, sense of community, an inquiry stance toward professional practice, and capacity-building through shared leadership. See Table 1 below for a summary. (For a full discussion, see Nehring and Fitzsimons 2011; Nehring and O'Brien 2012) While we know that these traits are strongly linked with high performance based on conventional examination metrics, it is unclear what role they may play in the fostering of twenty-first century learning.

## Conceptual framework

Based on the literature review, a conceptual framework was designed for investigating how schools included in the larger international study mediate both the pressure to perform on basic skills assessments and the need to prepare students for the twenty-first century. For the purpose of this study, various definitions of twenty-first century skills were reviewed along with scholarly theory focused on deeper learning (Brookhart 2010; Pellegrino and Hilton 2012). Findings were

**Table 1** Research summary of traits associated with high performing and low to moderate performing schools

| Traits of low to moderate performing schools | | Traits of high performing schools | |
| --- | --- | --- | --- |
| Finding | Source | Finding | Source |
| Low cognitive demand | Nystrand and Gamoran (1991), Cuban (1986) | High cognitive demand | Newmann and Associates (1996) |
| Low collective efficacy | Evans (2009) | High collective efficacy | Hoy et al. (2006) |
| Low student expectations, particularly for marginalized student groups | Brophy (1983), Cochran-Smith et al. (2004), Cooper and Tom (1984), Cooper et al. (1984), Howard (2003), Ketter and Lewis (2001), Miron 1996, Raudenbush (1984), Rousseau and Tate (2003) | High expectations for all students | Ancess (2003), Hoy et al. (2006), Leithwood (2010) |
| Teacher isolation | Lortie (2002), Sizer (1984) | Collective responsibility for student learning | Lee and Smith (1996) |
| | | Shared instructional norms, collaborative examination of practice | Yasumoto et al. (2001) |
| | | Shared vision and purpose; sense of community | Waters et al. (2003), Leithwood et al. (2004), Leithwood (2010) |
| | | Inquiry stance toward professional practice | Calhoun and Joyce (2005) |
| | | Capacity building through shared leadership | Hallinger and Heck (1998, 2010a, b, 2011a, b), Mascall and Leithwood (2010) |

synthesized into a taxonomy, which was used as an organizational and analytical tool for the current case study. The taxonomy sharpens our focus on the tasks that students are asked to execute in classrooms as well as in school-wide activities across cognitive, interpersonal, and intrapersonal domains. Tasks are defined by the answers students are required to produce and the routes that can be used to obtain the answers (Doyle 1983). Students will, therefore, learn what the task leads them to do. The "task" is constituted by three aspects of students' work: (1) the products students are expected to generate (e.g., an essay); (2) the operations students are expected to use to generate the product (e.g., memorizing a list of words); (3) the givens or the resources available to students while they are generating the product

(e.g., success models of an essay; Doyle 1983). One would expect that the acquisition of twenty-first century competencies would necessarily increase with task demand. The taxonomy facilitated our understanding of task demand by aiding us in identifying tasks that require students to: recall, apply, analyze, and evaluate information; engage in creative and reflective thinking, use information literacy, work collaboratively, employ leadership strategies, and demonstrate openness and flexibility.

The authors share with many scholars included in this literature review, the view that domain specific knowledge is inseparable from skills and the conviction that civic engagement and personal development are at least as important a rationale for public education as workforce preparation. The authors also hold the view that students' opportunities to develop twenty-first Century knowledge and skill is inextricably tied to school-level factors, which are an important aspect of our conceptual framework.

## Research question and methodology

This study sought answers to the following question:

How, if at all, does a *school* that serves a large percentage of low income students and that significantly outperforms its demographic peers on state mandated, standardized achievement tests, promote twenty-first century learning?

1. How, if at all, is twenty-first century learning fostered in the classroom?
2. How is it fostered school-wide?

   a. What role do school-wide traits such as high cognitive demand, high expectations for learning, and collective responsibility for learning play in promoting twenty-first century learning in and across classrooms?

## Site selection

The research sites for this study were identified by analyzing publicly available test data and demographic data for all publicly funded post-primary schools in Northern Ireland (Department of Education of Northern Ireland, author request for information). Top performing schools serving a large (>25 %) percentage of low income families were identified. All schools meeting this criterion were then banded into demographic peer groups consisting of schools with a similar percentage of students eligible for free school meals. The groupings were >50, 40–49, 30–39, and 25–29 %. A calculation was performed for each school that took an average of 2010/11 and 2011/12 (preliminary) test scores achieving 5+ GCSEs grades A*–C (including equivalents) including GCSE English and GCSE maths. The standard deviation for schools within each FSME grouping was then calculated. All schools above the standard deviation for their group were then compared with schools in other groups and ranked according to their deviation from the mean. Thus schools from different

peer groups were compared with each other in a way that adjusted for the differing percentages of students eligible for free school meals.

Inspection reports for top performing schools were then reviewed for evidence of instruction in twenty-first century skills and inquiries were made within professional networks for schools showing promise with twenty-first century skills instruction. Seven schools identified using these methods were visited; informal interviews were conducted with the principal and key staff and informal visits were made to classrooms. Other schools not in the pool of potential sites were visited for comparison purposes. From the seven schools visited, three were chosen based upon three criteria: high level test performance based on the method described above, >25 % low income student population, and evidence of twenty-first century skills instruction. A fourth school that did not meet the performance criteria was included because it showed promising growth. Case studies were developed for all schools chosen. This paper reports on one case of particular interest for reasons described below. All other schools for which case studies were developed showed similar patterns and support the findings reported here. (The other case studies are available from the authors).

## Case study site

The case study site was a rural, secondary, Integrated school (50 % Catholic, 30 % Protestant, 20 % other) in Northern Ireland. The school serves approximately 670 students within an attractive and well provisioned campus constructed within the last ten years. The percentage of students eligible for free school meals stood at 28 %. This school ranked an impressive 2 overall out of 76 secondary schools in Northern Ireland for GCSE scores with >25 % FSME calculated in the manner described above under "Research Questions and Methodology". This school also exhibited attributes in inspection reports suggesting a potential focus on twenty-first century skills. Though not specifically mentioned by professional networks as a school that focuses on twenty-first century skills, during an informal preliminary visit, it showed itself as a site where twenty-first century skills were being taught and practiced by students. As an integrated school it joins a small cadre of state schools, enrolling approximately 7 % of the province's school age population, that deliberately mix youth from Catholic, Protestant, and other religious communities.

## Data sources

The lead researcher spent approximately 8 days on site. While there, he observed classes and staff meetings, conducted focus groups with teachers, administrators, and students, including follow-up interviews, and guest taught several classes. Publicly available documentation was also reviewed including instructional materials and the school's website.

## Data analysis

All data were coded using a taxonomy for skills designed by the researchers, as discussed above. Data were also coded according to when and how twenty-first century skills were taught by the school and practiced by students. From the coded data, themes were identified that were responsive to the research question. Data were also coded for whole school traits, as discussed above.

# Findings and discussion

Analysis revealed three broad findings, each of which encompassed several more specific findings. The three broad findings are (1) The variety of assessment strategies strongly influenced the presence and absence of twenty-first century skills instruction from classroom to classroom; (2) The pastoral care program tended to foster twenty-first century skills schoolwide; and (3) Whole school traits associated with high performance significantly advanced twenty-first century skills instruction.

## Assessment strongly influenced students' exposure to twenty-first century tasks

A variety of strategies were used to assess student learning—depending on the subject, academic track, and year ('grade level' for American audiences). Strategies included externally administered, traditional exams (time-bound, on demand); locally developed traditional exams; performances and projects accompanied by rubrics and often collected into a portfolio; practical exams; and a mix of familiar teacher-developed assessments such as daily homework, participation, quizzes, essays, labs, problem sets, etc. In general, we observed that as reliance on performances and projects collected into a portfolio increased, so too did the instructional demand for twenty-first century skills. Inversely, as reliance on an externally administered traditional exam increased, instructional demand for twenty-first century skills decreased. In addition to these varied assessment strategies, the occasional absence of any assessment associated with a given learning experience appeared to be an influential force with respect to twenty-first century skills as well. In learning situations where teacher-developed assessment strategies were used and in situations where there was NO formal assessment, the instructional demand for twenty-first century skills also tended to be strong. Following is a detailed exploration of these phenomena.

Instruction emphasizing twenty-first century skills was evident in courses in which assessment was something other than a traditional external exam, meaning a written, on-demand, time-bound test. Such courses tended to include key stage 3 courses, GCSE courses with less than 50 % exam assessment, and A-level courses with less than 50 % exam assessment. Twenty-first century skill instruction was especially evident in courses driven by an assessed project with a product, meaning an extended, complex task, contextualized by a real-world scenario, culminating either in a performance or a product or both.

For example, in a science class from key stage 3 (which encompasses years 8–10 when students are typically ages 11–14), students were asked to work in pairs to create several different ratios of ingredients in a set of test tubes to produce solutions with various pH levels. The task required students to think like scientists, thereby using strategic reasoning in order to make sense of the phenomenon they observed. Indeed, the teacher set before students a task that required them to demonstrate their ability to apply major aspects of scientific investigation, namely collecting data through observation, questioning and hypothesizing about what they observed, and testing and evaluating their hypothesis. Moreover, the collaborative nature of the task meant that students served as a resource for learning—potentially expanding the pool of knowledge students have of the scientific principles that underlie pH levels. The collaborative nature of the task also necessarily meant that students had to practice interpersonal skills (e.g., effectively communicating, cooperating) in order to produce solutions with various pH levels. By exposing students to a task with inherently high cognitive and interpersonal demand and with application to the worlds of medicine, oceanography, forestry, food science, water treatment, etc., the teacher provided opportunities for twenty-first century learning.

In this class, there was no external exam. As students move from key stage 3 into key stage 4 (GCSE), assessment in many courses shifts to external examination. For science, most of the assessment in key stage 4, measured as percentage of mark, is based on an external exam. Teachers commented frequently in focus groups that the shift in assessment from key stage 3 to key stage 4, across many subjects, produced a shift in teaching featuring a reduction in demand for twenty-first century skills and an increase in demand for recall and application. One teacher commented, "In key stage 3 classes, all the wider skills [twenty-first century skills] have been planned for, but at key stage 4, they're not. It's all tests." Another teacher during the same focus group said, "I find a gap between key stage 3 [and key stage 4]. The first [key stage 4] exam is very much about [recall, application, and analysis] skills. And there's so much to learn that it is incredibly content led." During another teacher focus group, a third teacher commented, "Our revised curriculum at key stage 3 is all about skills—managing your own learning, interpersonal skills—and we all assess those. But at key stage 4 they're not really in the exam papers. So it seems to be important at key stage 3 but it's not in there in key stage 4. There are gaps there." Such observational and interview data suggest that a reliance on external exams tends to reduce the level of demand when compared with courses that are not assessed with an external exam. And, while teacher comments could be interpreted as reinforcing critics' concern about a "gap" between discipline-specific content and twenty-first century skill (in applying discipline specific knowledge), the classroom instruction highlighted here suggests that addressing both is possible when the primary means of evaluating students' learning is not an external exam.

Not all GCSE and A level classes, however, are governed primarily by external exams. For example in Engineering, only 40 % is external exam. Interestingly, the skill demand in such courses tended to be high. For example, in GCSE year 12 engineering, students were charged with the task of designing a table top holder for a tablet computer. Each student had to complete a series of technical drawings with extensive notes. They had to evaluate their drawings and, based on their knowledge

of relevant engineering principles, they had to make reasoned decisions about which design to pursue. Moreover, the task required students to think creatively to design a holder that met the specifications—students had to engage in thoughtful planning in order to create a new structure. Following is an excerpt from research notes just as the teacher had finished giving an explanation of the task to the class.

> …students seem quite attentive and engaged. He tells the students to get started. As they start, students ask questions, which he fields while students are starting work.
> 9:42 All students appear to be at work. Some are at computers, others at table with pencils and drawings, one is consulting with teacher with a drawing in front of him. Some students are working quietly on their own. Others are chatting. Talk appears to be mostly about the work. There is an atmosphere that is purposeful but relaxed.

Importantly, the purposeful nature of the task suggests clear lesson intentionality and task accountability. In other words, it is clear to students what they are to produce, they are aware of the resources available to them (including their own notes and the teacher's feedback), and they know that they will be called on to demonstrate their knowledge and skill (when they present their final product). Such an open-ended, high-risk task that requires students to rely on their own creativity could produce anxiety and disengagement in students; often students respond to such task demands by trying to mediate the perceived risk. They do this by asking questions that will transform academically rigorous tasks (i.e., those that require higher level cognitive processes) into low level procedural tasks (Doyle 1983). In the class highlighted here, a student and teacher are observed in a short exchange:

Student  Do I get marks for putting a label under the drawing? Do I get marks for putting a wee explanation over here?

Teacher  You get marks for showing understanding of your design. You get marks for designing something that can actually be made

While the student tries to mediate the risk associated with this task by trying to boil it down to something easier/more low level, the teacher redirects the student to his responsibility for designing (engineering) a table that can actually be used (i.e., will hold up a tablet). This is not to say that students in the class are not receiving the critical feedback they need from the teacher to execute the task. Rather, the teacher deflects low level questions by offering feedback that is responsive to the technical and creative challenges inherent in the engineering task. Thus, the teacher mediates students' perception of risk and encourages their full engagement by creating a twenty-first century learning environment characterized by clear purpose, accountability, and support.

This example represents, as well, an additional category of classes in which a project and a related product were the main object of student attention. The teacher's role in such classes was deliberately underplayed or *backgrounded*, while the student's role was *foregrounded*. The importance of the teacher's role is underscored in how the goals of the task are explained, in what resources the students have at their disposal during execution of the task (i.e., peers, teacher

feedback, materials, exemplars, etc), and in how students will be asked to account for their learning once the task is executed. While the teacher orchestrates the classroom activity in his set up and monitoring, students are the primary actors during class: they are doing the work (Doyle 1983).

A major challenge for this school is finding ways to infuse higher level thinking into classes that are dominated by traditional, external exams. While teachers in KS3 classes and KS4 classes without a formal exam were able to bridge the ostensible gap between rigorous content and twenty-first century skills (or application), KS4 classes continue to be dominated by teaching and learning that promotes recall and procedural application.

## The pastoral care tended to foster twenty-first century skills schoolwide

According to the Department of Education of Northern Ireland (DENI), pastoral care, which encompasses the school's efforts to nurture the social, emotional, and spiritual development of its students, is also concerned with preparing post primary school students for the demands and challenges of adult and working life. As such, the department argues that pastoral care is "most effective when it is all pervasive and fully integrated into the school's daily routines, its curriculum and its extra curricular activities"(www.deni.gov.uk). According to policymakers, the quality of pastoral care can influence the whole school ethos and it is particularly powerful when tied directly to the revised curriculum, Learning for Life and Work. Data from observations, focus group conversations, and document review suggest that the case study school's pastoral care is an area rich in task demands for twenty-first century skills at the case study school. The school's pastoral care program operated through the personal development curriculum, peer mentoring, academic support programs, and extra-curricular program, including student council.

The heart of this school's pastoral care program is a well developed, vertically and horizontally aligned curriculum for personal development that builds a range of twenty-first century skills. Given the results-driven education culture of the province, the Personal Development program could easily become marginalized since, strictly speaking, it is a non-academic activity. However, due to staff support of the curriculum and the school's commitment to the whole child, Personal Development is central to school life. One supporting document from the curriculum, for example, explains a thoughtful approach to target setting, which is evidence based, and clearly measurable while granting teachers and students latitude in focusing on exam results, other academic goals, or process goals. An excerpt from the document, "Smarter Targets", explains the acronym embedded in the title: "S-Specific; M-Measurable; A-Achievable; R-Realistic; T-Timebound… but now we add the ER: E is for Evaluate; R is for Re-assess or Re-evaluate (it can also mean record)." A second excerpt illustrates the range of goals a student might set using the SMARTER process: "Remember that targets can be based on: Just one or two subjects; Study or revision skills that will help in a number of subjects; How or when or where you do your homework; Finding out more; Getting better at something; Committing yourself to something; Your attitudes and approaches."

Such target setting using specific guidelines fosters metacognitive skill as well as a host of higher level cognitive skills.

While more formal support services were provided by adults at the school as part of the pastoral care program, students were deployed on a regular basis for peer support in both academic and social/emotional capacities. The use of students in this way was so extensive that it is fair to consider participation in peer support a regular and expected part of student life, as opposed to an elective activity in which only a few students take part. The students work together to improve academically, to address areas of peer conflict, and to advocate for school-level changes that are important to the students. Through the school's peer support network, both provider—usually an older student—and beneficiary—usually a younger student—practiced collaboration skills. In collaborating with peers, they learn how to communicate effectively, how to take different perspectives, how to negotiate and resolve conflict, and what it means to take on a service orientation. One teacher pointed to a range of activities outside of academics in which students build twenty-first century skills by explaining, "If there are difficulties between two students, we take a pastoral approach [as opposed to a disciplinary approach] and we get the students to think about the other pupil, getting them to put themselves in the position of other student. Thus, they evaluate their own actions to inform further behavior." In addition, the provider practiced skills associated with leadership while the beneficiary gained practice in metacognition (such as academic planning sessions and study skills tutorials). In their work as leaders, they learn to be flexible, adaptable, responsible, and assertive. While not necessarily directly tied to academic subject matter, these skills prepare students for the demands of both the evolving labor market and a democratic society (Anandiadou and Claro 2009; Murnane and Levy 1996; Voogt and Roblin 2012). Each of these broad areas of activity promotes twenty-first century skill development. More specifically, the tutoring role calls on students to demonstrate important inter and intrapersonal skills.

While there is no formal assessment of higher level skills for most of these activities, there is substantial evidence from observations and interviews with students and teachers that task demands for twenty-first century skills are a signature element of these sorts of pastoral care activities. The pastoral care policies created an ethos that touched all aspects of school and that fostered a sense of shared vision and purpose while also instilling in teachers and students a sense of collective responsibility for moving the school forward.

## Whole school traits identified in the literature review above significantly advanced twenty-first century skills instruction.

Guided by our conceptual framework, our analysis of field notes revealed the very strong presence of school level traits that are associated with high performance, namely shared vision and mission, high expectations for all students, shared responsibility for student learning, collaborative examination of instructional practice, and shared instructional norms. While the findings regarding assessment and pastoral care go a long way in explaining *when* and *how* twenty-first century

teaching and learning occurs, the patterns of activity surrounding whole school traits say much about *why*. Consistent attention to twenty-first century skills across all aspects of school life was evident in three areas mainly: (1) the school's effort to place integration at the center of its community life; (2) its gifted and talented program which is deployed in a way that influences the experience of all students regardless of their formal participation in the Gifted and Talented program; and (3) in the principal's approach to leadership whereby he positions himself as the lead teacher of the student body as-a-whole and as an instructional coach to the teaching staff.

As an integrated school, this school has enrollment targets of 40 % Protestant, 40 % Catholic and 20 % other. Integration, however, extends far beyond the mere identification of students for enrollment purposes. The staff makes a concerted effort to use the diversity of the student population and the idea of school integration to advance mutual understanding, and, along the way, a host of twenty-first century skills. For example, the researcher's visit coincided with the United Kingdom's Day of Remembrance, which uses the anniversary of the World War I Armistice, November 11, to commemorate soldiers who have died in any and all wars. In Northern Ireland, this day is highly revered within the protestant/loyalist community and involves the whole community in public ceremonies in the Town Square, churches, and schools. Within the Catholic/Republican community, however, the day is problematic since, for many, the British Army has been the enemy through much of Irish history, including the recent Troubles, and, for some, the ongoing conflict in Northern Ireland. Despite the potential for conflict, in the week before Remembrance Day, the principal made it the focus of Junior and Senior Assemblies in the school's all-purpose room. He opened the assembly by saying, "We know that in Northern Ireland Remembrance is seen as something that is celebrated by one community and not the other. That's not how we do it at [name of school]. You will see I am wearing a Poppy. You are welcome to wear one too or you can choose not to. It is up to you. I don't tell the staff to wear one. If you choose to wear one, you can get one at the Reception." The principal continued with a moving speech and slide show about the tragedy of war and the power of positive peace-building. He concluded: "Creating peace is full of adventure, and we stand for that at this school. It needs bravery, imagination, determination and resourcefulness. Are you strong enough to stand up and be different? Are you brave enough to stand for non-violence? We believe there is always a way to stand and face each other and avoid conflict. Making peace is something everyone can do. It just takes the right attitude.… Our theme this year is to be a trailblazer, to be different." Through such leadership, the principal turned a potentially divisive occasion into a powerful opportunity to cultivate intellectual openness among all attendees. Immediately after the assembly, students met in their registration classes for a lesson from the Personal Development Curriculum. In the year 9 registration class attended by the researcher, the teacher led a lesson in which students related their personal connections to war by discussing the involvement of family members. The care and thoughtfulness with which this holiday was treated is not an isolated event in the school's life. According to our data, integration, and the opportunities/challenges it presents are regularly exploited for their instructional potential.

The second distinctive feature of this school is its Gifted and Talented program. Originally conceived by the principal as a lure for high achieving students who tended to apply to (higher status) grammar schools in the area, it has been designed in a way that benefits all students, exposing them to twenty-first century learning. Participation in the program is by application and students may apply each year by subject, which opens access considerably across the student body. Students in the program remain in regular classes and are tasked with special assignments and activities. The principal and several others at the school explained that staff development often includes gifted and talented teaching strategies which teachers regularly apply beyond the gifted and talented cohort, thus bringing opportunities for deeper learning to students beyond the program. The Gifted and Talented Coordinator explained the reasoning for this approach to gifted and talented programming by simply stating, "A rising tide lifts all boats."

The school's third distinctive feature is the principal's approach to leadership. He regularly places himself before the entire student body, through weekly assemblies, as a kind of lead teacher. As with the Remembrance Day assembly described above, he often brings lessons focused on deeper learning to the whole school. In addition, he serves as an instructional coach to the entire staff. He designs and leads many of the professional development workshops, focusing on such topics as teaching for higher level thinking and differentiation of instruction.

## Implications and recommendations

### Implications and recommendations for policy, practice, and research

The existing body of relevant literature combined with findings from the case study schools support the claim that external exams, as currently administered by the Department of Education of Northern Ireland (DENI), have a deadening influence on twenty-first century learning. Our analysis, combined with existing research findings, suggests that because external exams are particularly intensive in core academic subjects, students enrolled in courses that require external exams risk reducing their exposure to twenty-first century learning. If these patterns hold generally across secondary schools in Northern Ireland, then DENI should immediately begin exploration of alternative assessment strategies in core academic subjects. A promising alternative is suggested by this research, namely extended projects with clearly articulated products, portfolios and other locally based assessments. The use of these assessment instruments was strongly associated in this case with instruction in twenty-first century skills. In addition, DENI should leverage pastoral care and prioritize intersectarian integration as a means to fostering twenty-first century skills. This case suggests that substantial cross-community contact, developed in meaningful ways, is a potentially powerful lever not only for peace-building in the province, but high level learning for the province's youth. Greater policy level emphasis should be placed on such efforts.

School leaders control levers that powerfully influence classroom level learning. Results from this case suggest that the whole school traits associated with high

performance (as measured by conventional means) can be directed toward twenty-first century learning, and when they are, the impact on classroom instruction and school ethos is significant. It can even serve as a strong countervailing force against the negative force of external exams on quality of instruction. It is the responsibility of school leadership teams to choose whether their focus will be entirely on test results (for which there is great pressure and strong incentives emanating from education policy), or whether twenty-first century skills will also be valued and deliberately pursued, even though there is little to no policy pressure or incentive. This case should give school leaders encouragement that if they will focus on twenty-first century learning, while paying strategic attention to exam performance, they will be rewarded not only with deeper learning but strong test results as well. School level practitioners should also study the ways in which integrated schooling may be able to leverage intersectarian contact for the teaching of twenty-first century skills. Many schools in Northern Ireland, while not integrated, nonetheless participate in intersectarian programs such as Shared Education, which puts students and staff into regular contact with counterparts across the sectarian divide. Such opportunities should be expanded and more systematically mined for their twenty-first century learning potential. Through such efforts, the vision of faith based schools may evolve over time to embrace a more pluralistic community. As shown by our case study school, it is possible for teachers, when supported by their school leaders, to focus on twenty-first century learning, even in courses dominated by external exam-based assessment.

If twenty-first century skills are to be advanced as a major focus of primary and secondary education, then colleges of education should counter policy initiatives that advance traditional testing as a dominant force in state education. They can begin to do this by infusing their teacher training and leadership training with the theoretical foundation and practical skills associated with twenty-first century learning and by preparing teacher initiates to advocate for the infusion of twenty-first century skills into instruction even when the culture of their schools is driven by external assessment practices that discourage instruction in twenty-first century skills.

The variation in assessment instruments for GCSE and A-level courses from one subject to another raises the questions, why is one form of assessment chosen over another, and why do assessment instruments vary from subject to subject? Currently, the mathematics GCSE in Northern Ireland is 100 % on-demand examination. The history GCSE is 75 % on-demand examination. For art and design, the GCSE is 100 % portfolio and controlled assessment, both of which are externally moderated. (This and further information available at www.ccea.org.uk). Quite likely, these choices are based on the ways in which the various disciplines are conceptualized and the types of skills required for proficiency within a given conceptualization. But why are these particular conceptualizations adopted? Why is art and design focused mainly on the creation of original work and history mainly upon the recollection of historical facts and theories or maths on procedural skills and analysis? Why is art not focused on the recollection of various artists and artistic epochs? Why is history not focused on the creation of original historical investigations and hermeneutics? Why is maths not focused on applications of

mathematical principles to real world contexts? To the extent that academics play a role in the development of key stage 4 and 5 curricula and assessment, they need to advocate learning that brings together domain specific knowledge ("the basics") and twenty-first century skills. How academics, educationists and other thought leaders choose to answer such questions and thereby conceptualize various school subjects carries enormous implications for the intellectual experience to be had by students.

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