Improving Second-Level Education:
Using Evidence for Policy Development

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RENEWAL SERIES

PAPER 5

December 2011

ESRI

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The ESRI

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Acknowledgements

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Abstract

Second-level education has a crucial role to play in Ireland's long-term economic prosperity, as well as being intrinsically valuable, allowing young people to develop intellectually, socially and personally. Much of the debate internationally has focused on how countries compare against international benchmarks and indicators like PISA. This paper argues that, while we can potentially learn from what other systems have 'got right', it is important that we do not fall into the trap of engaging in 'policy borrowing'. Furthermore we now have a rich evidence base in Ireland on 'what works' in terms of school organisation and process. The paper reviews this evidence in a number of key areas: ability grouping, school climate, teaching and learning methods, and curriculum and assessment. The discussion reviews how these aspects of school policy and practice can make a substantive impact on student outcomes and act as 'drivers' of improvement, often requiring relatively modest levels of expenditure.

1. INTRODUCTION

Education matters because it is intrinsically valuable, allowing young people to develop intellectually, socially and personally. Education plays a central role in developing human capital and this is crucial to our long-term economic prosperity and, in particular, to our recovery over the coming decade. It matters too because it is a strong predictor of adult life chances, influencing access to, and quality of, employment, income levels and even health (Smyth and McCoy, 2009). How best to invest in education to enhance individual and social benefits has therefore been the subject of a good deal of debate in Ireland and internationally. International research has shown that the benefits of certain educational interventions considerably exceed their costs, revealing the longer term pay-off of increased (targeted) educational investment (Levin, 2009). The recent situation in Ireland has been one of reductions in some elements of educational provision. Since 2009, a number of cuts have been made, some of these general in nature (e.g. the increased pupil-teacher ratio and moratorium on middle management recruitment) and some impacting on specific groups, with a reduction in provision for disadvantaged young people in non-DEIS schools along with some curtailment of specialist provision for English language learners, Travellers and young people with special educational needs. There is little systematic evidence to date of the impact of these cuts on what is happening in schools and classrooms. Within the second-level sector, assessing the impact of an increased pupil-teacher ratio is complex. It may result in larger classes for existing subjects, with potential implications for the kinds of teaching methods used and the capacity of teachers to cater for the diversity of student needs in the class. It may also mean that some subjects (particularly 'low-demand' subjects such as Chemistry and Physics) or some programmes (such as Leaving Certificate Applied) can no longer be provided by the school. Previous research points to the focus of existing guidance resources on senior cycle, especially sixth year, with less provision at junior cycle level where young people make key decisions (McCoy et al., 2006; Smyth et al., 2011). The removal of the specific allocation to employ guidance counsellors in Budget 2012 is therefore likely to have a significant effect on schools' capacity to support student choices of subjects, programmes and post-school pathways, and to provide personal and social supports to students. This is likely to prove particularly significant for young people from less advantaged backgrounds who are far more reliant on advice from their school in making post-school decisions and particularly decisions in relation to higher education entry (McCoy et al., 2010; McCoy and Byrne, 2011).

In the context of constrained expenditure on education, it is all the more important that policy development be informed by sound evidence. This paper draws on Irish and international research to look at the way in which evidence can inform the future direction of second-level education. The remainder of the

introductory section examines debates about bench-marking educational performance across countries and highlights the current challenges for second-level education in Ireland. The second section identifies a number of key areas in which research evidence can contribute to enhanced practice at the national and school levels. By necessity, there are limitations on the scope of this paper. The focus is on second-level education because it is beyond the scope of one paper to consider research evidence at primary level as well, since many of the findings and issues at primary level are quite distinct. Furthermore, the emphasis is on using evidence to inform policy and practice at the national and school levels rather than feeding into the practice of individual teachers. Regardless of these limitations, it is hoped that the paper will provide a useful contribution to understanding how different dimensions of school organisation and practice could be used to enhance young people's educational development.

1.1   Comparing educational achievement across countries

There has been considerable debate internationally about how to assess and improve the quality of education. Cross-national surveys (such as the PISA studies of 15 year olds conducted by the OECD) have been used by countries to compare themselves against international benchmarks and are 'increasingly used as the ultimate reference on the "quality of education"' (Mortimore, 2009). Such data have been used not only as a source of information on different educational systems but as a basis for policy prescription (Porter and Webb, 2008; Alexander, 2010). The two McKinsey reports (McKinsey & Co., 2007; Mourshed et al., 2010), for example, have sought to identify the features of 'successful' and 'improving' systems on the basis of PISA (and similar) test scores. The high levels of achievement, and low levels of inequality in performance, found in Finland have attracted a good deal of attention from stakeholders in other countries. A number of commentators have sought to explain Finland's success, although different accounts often emphasise distinct features. The factors highlighted have included: the high quality of teacher education; the high status of teachers and support for education among the wider community; the significant level of school and professional autonomy; the comprehensive nature of the second-level school system; a broad commitment to social equality in society in general; and the culturally and linguistically homogeneous nature of the population (Kupiainen et al., 2009; Simola, 2005; Lavonen and Laaksonen, 2009).

Ranking countries in this way has had a good deal of popular appeal, receiving considerable coverage in the media and prompting policy-makers in a number of countries to embark on educational reform in the wake of 'PISA panic'. However, using cross-national surveys as a basis for policy development has been subject to considerable criticism. Firstly, a number of well-regarded academics have pointed

to the difficulty in achieving true comparability across countries because of fundamental differences in language and culture, and in the relationship between the national (or local) curriculum and the kinds of skills measured by PISA (Bradshaw et al., 2009; Goldstein, 2004; Mortimore, 2009). Furthermore, it is argued that such cross-national surveys focus only on a sub-set of the skills and competencies developed in the schooling system (Clifton, 2011). Secondly, and even more importantly, questions have been raised as to whether and how such data can be used to bring about the improvement of national educational systems. Commentators make an important distinction between approaches which are based on 'policy borrowing'[1] and those based on 'policy learning' (Lingard, 2010; Raffe, 2011). A policy borrowing approach looks for a unique, transferable example of 'best practice'; in other words, it asks 'why can't we be more like Finland?' and seeks to 'transplant' elements of that system into another country. However, this approach fails to take account of the complex ways in which education systems are embedded in broader historical, cultural, social and economic circumstances, a complexity which makes the idea of 'borrowing' policies from another context fraught with difficulty. Furthermore, such a perspective (as exemplified by Mourshed et al., 2010) is not based on systematic data comparing the characteristics of 'improving' and 'non-improving' systems (Raffe, 2011); it is merely assumed that the features of improving systems account for this improvement. In contrast, a 'policy learning' approach uses international evidence not for a 'quick-fix' solution but to inform thinking about policy development in the specific national context, looking at how 'good' rather than 'best' practice varies by context, time and place (Raffe, 2011).

If we are to learn from international experience in this way, what kind of evidence is likely to provide useful insights for policy development? There has been international debate about 'what evidence counts', with controversy over the relative benefits of different sources and types of information. In particular, there has been a good deal of disagreement over the relative value of randomised controlled trials (where particular interventions are introduced in 'experimental' conditions) and research which depicts 'real-life' variation (see, for example, Slavin, 2004; Bridges, 2008; Wiseman, 2010). There is also the danger that conceptions of quality will be driven by what is easily measurable: 'Quality has tended to be conceived not as what it actually is but as how it can be measured' (Alexander, 2008, p. 3). Looking across existing literature, the kind of research evidence which is likely to facilitate policy learning is found to have certain features; these include the following dimensions:

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[1] This is often referred to as 'policy emulation' in the economics literature.

- A range of outcomes should be considered. The vast majority of research studies focus on academic achievement (often defined as performance on standardised tests) but less is known about the factors shaping student engagement and motivation, early school leaving, take-up of particular subjects, and later participation in lifelong learning. Children and young people themselves emphasise the affective (emotional) as much as the cognitive (learning) domain in discussing their school experiences (Alexander, 2008).

- Findings should be placed within their overall context (Seidel and Shavelson, 2007). The issue of culture has generally been ignored in educational research, especially that focusing on school effects (Alexander, 2008). Cultural contexts uniquely shape educational and social communities (Wiseman, 2010; Alexander, 2010) so the 'generalisability' of findings from a particular context should be interrogated. Thus, the extent to which particular findings reflect the specific educational system and/or broader structures of socio-economic inequality should be taken into account.

- The processes and outcomes for different groups of children and young people should be considered – what works for whom? Many studies focus on 'average' effects but the impact of certain factors may vary by gender, social class, ethnicity and prior achievement. For example, a sizeable number of English schools are effective for lower ability students but not for higher ability students, and vice versa (Dearden et al., 2011).

- Evidence should ideally draw on a mix of sources, including students' own perspectives. An increasing body of work shows the value of taking account of the student voice in school improvement (Rudduck and McIntyre, 2007). Further, a review of a large number of research studies conducted by Seidel and Shavelson (2007) indicates that student reports of teaching methods are more strongly predictive of academic outcomes than teacher reports.

In the following sections, these criteria are used as a guideline in discussing what conclusions can drawn from existing research on the quality of second-level education.

1.2 Challenges for Second-Level Education in Ireland

The discussion so far has looked at international debates about educational quality and standards. How does Ireland fare from this perspective? Using international benchmarks, expenditure on second-level education relative to per capita GDP in 2008 was around the OECD average (albeit after a sustained period in which expenditure had been below this average); rates of upper secondary attainment among young adults were above the average for EU21 countries; and

the ratio of students to teachers at junior cycle was around the European average (though this may have changed since 2009). In 2009, performance among 15 year olds in PISA was below average for mathematical literacy, average for reading literacy, and above average for science literacy and digital literacy (Cosgrove et al., 2010, 2011; Shiel et al., 2010). The low, and relatively declining, levels of Irish performance in reading and mathematics literacy attracted a good deal of attention and prompted a new policy emphasis on promoting literacy and numeracy in primary and post-primary education (DES, 2011). However, such benchmarks give a very partial view of the 'quality' of Irish education and taken in isolation give no indication as to what the appropriate policy response might be. In some ways, the reaction to the PISA results has deflected attention away from long-standing evidence which provides more detailed insights into the challenges facing the Irish second-level system; this evidence includes the following:

- There is persistent variation and inequality in educational outcomes: young people from working-class backgrounds have lower scores on literacy and numeracy tests, achieve lower exam grades at both Junior and Leaving Certificate levels, and are more likely to drop out of school before reaching the Leaving Certificate (Cosgrove et al., 2010; Smyth, 1999; Smyth et al., 2007; Byrne and Smyth, 2010). Previous research (Smyth and McCoy, 2009) has highlighted the way in which educational underachievement and early school leaving have significant societal and individual costs, with investment in education yielding substantive economic and social benefits for society at large.

- A significant number of young people make the transition to second-level education with literacy levels that make it difficult for them to engage fully with the curriculum (Smyth et al., 2004).

- There has been persistent evidence of lack of engagement in mathematics, with significant failure rates in mathematics exams, low levels of take-up of higher level mathematics at senior cycle level, and a focus on drill and repetition rather than deeper understanding in mathematics classes (Lyons et al., 2003; Smyth and Hannan, 2002; SEC, 2011), issues which have prompted the introduction of the new Project Maths curriculum.

- There is a mismatch between the more teacher-centred methods used in second-level schools and the more active methods which young people find engaging (Smyth et al., 2007, 2011).

- The pace of instruction in many second-level classrooms does not match student needs (Smyth et al., 2004), with less use of differentiation (that is, tailoring teaching approaches to meet the range of abilities in the class) than desirable in some settings (DES, 2007, 2008). This is an important issue given the increased diversity in classrooms resulting from recent immigration and from the mainstreaming of young people with special educational needs.

- The exam-focused nature of the system has had the effect of narrowing the range of learning experiences to which young people are exposed and has focused both students and teachers on 'covering the course' or 'teaching to the test' rather than achieving deeper understanding (Smyth et al., 2007, 2011).

Such evidence provides a firm basis for highlighting (some of) the issues to be addressed to improve the quality of second-level education.

2. WHAT REALLY WORKS?

The previous section outlined how research evidence can potentially contribute to policy formulation. In the current economic climate, increased investment in education is unlikely in the near term and the emphasis is likely to lie, as in other areas, on getting the best value from the resources available. Fortunately, there is now a large body of research which shows how policy and practice at the school level can make a substantive impact on student outcomes. This research identifies 'drivers' or 'levers' of improvement, and, as Fullan (2011) argues, 'these drivers work because they directly change the culture of teaching and learning'. Many of these changes would require relatively modest levels of expenditure. The remainder of this section outlines some of the ways in which evidence might inform policy development in these domains. The discussion draws on a wide range of studies conducted in different national contexts and using varied methodologies. The discussion of the Irish context relies mainly on large-scale quantitative and mixed methods research conducted at the ESRI[2] (in which the authors were involved) and at the Educational Research Centre[3].

2.1 School Effects

There is a large body of robust research which shows that 'schools matter', that is, what happens within the school can make a difference to how students fare, even taking account of student characteristics on entry to the school (for an overview, see Teddlie and Reynolds, 2000). A number of studies, mainly in Britain and the US, have pointed to the characteristics of 'effective' primary and second-

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[2] In particular, the discussion draws on the Post-Primary Longitudinal Study, the first study of its kind in Ireland. This study followed a cohort of students in twelve case-study schools from the point of entry to second-level education to the end of senior cycle, combining survey data with in-depth group interviews with students. Information on student experiences in school was supplemented by the accounts of key personnel, early school leavers from these schools, and parents of the student cohort.

[3] The Educational Research Centre, based on the campus at St. Patrick's College, undertakes a range of education research projects at all levels of the education system from pre-school to third level. It is funded by the Department of Education and Skills.

level schools, including high (but realistic) teacher expectations, staff commitment and involvement, student involvement, an orderly environment, and parental involvement (Brookover et al., 1979; Mortimore et al., 1988; Rutter et al., 1979; Teddlie and Stringfield, 1993). Teacher expectations can be directly reflected in the organisation of a school through the provision of more demanding courses and through guidance which actively encourages young people to go on to higher education (McDonough, 1997). 'Effective' schools set the conditions which foster teaching and learning within the classroom, an issue to which we return below. While the effects of many school factors are argued to be common across very different national contexts, findings relating to the role of the school principal in particular are seen as more variable. The importance of the principal as instructional leader, rather than just administrative manager, has been identified in a number of studies, although the potential influence of the principal is reduced in highly centralised educational systems (Brookover et al., 1979; Rutter et al., 1979; Hattie, 2009). Irish evidence indicates that second-level principals in Ireland are likely to fall closer to the administrative rather than instructional leader end of the spectrum (Gilleece et al., 2009).

While some research has focused on the effect of school processes on 'average' student outcomes, a growing body of research indicates that the impact of schools may vary across different groups of students. Thus, some schools in England have been found to be more effective for lower ability students while others enhance the achievement levels of higher ability students (Thomas et al., 1997; Dearden et al., 2011). Schools may also be differentially effective for different social class, ethnic or gender groups (Smith and Tomlinson, 1989; Sammons et al., 1997).

In Ireland, research has indicated significant differences between schools in a range of student outcomes, including achievement, attendance, early school leaving, subject take-up and personal-social development, controlling for differences in student intake (Hannan et al., 1996; Smyth, 1999; Smyth et al., 2011). Junior and Leaving Certificate achievement are found to be higher in schools with a more positive disciplinary climate, less negative teacher-student interaction, a more flexible approach to subject choice, greater student involvement and higher teacher expectations, all else being equal (Smyth, 1999). School practice is found to be more important for students with initially lower levels of academic ability (Smyth, 1999). Student attendance is higher where young people experience positive relations with their teachers and those teachers have high expectations, and where staff are more involved in school decision-making (Smyth, 1999). Negative interaction with teachers and peers is also associated with early school leaving (Byrne and Smyth, 2010). In keeping

with international research, schools in Ireland matter less for personal development than for academic outcomes (Teddlie and Reynolds, 2000; Opendakker and Van Damme, 2000). Even so, certain aspects of the school process, especially relations with teachers and peers, are found to have a significant effect on student self-image and stress levels (Smyth, 1999).

While international and Irish studies point to a range of factors associated with student outcomes, two aspects of school organisation and process are worth highlighting here: ability grouping and school climate (measured in terms of the quality of teacher-student relationships).

2.1.1 Ability Grouping

Types of ability grouping can generally be classified as streaming, setting or mixed ability. **Streaming** involves using performance on a test (or another metric) to allocate students to different classes on the basis of (assessed) ability.[4] In this system, students are placed in a lower stream class for all subjects, including Physical Education and Metalwork as well as English and Mathematics. **Setting** is a more flexible form of ability grouping, whereby students are allocated to 'higher' or 'lower' sets depending on their ability in a particular subject. Thus, a student may be in the lower set for Mathematics but in the higher set for English. **Mixed ability** grouping may occur by design (if a school wishes to have a genuine mix of students in each class) or as a result of random allocation to class groups.

International studies have found that streaming results in very different educational and social experiences for students attending the same school. Students allocated to lower streams experience very different learning processes, with lower academic demands and less emphasis on the kinds of discussion-based approaches which facilitate achievement (Applebee et al., 2003; Oakes, 1990, 2005). As a result of being labelled in this way, many students develop very negative views of their own abilities (Hansell and Karweit, 1983), resulting in some instances in the development of an anti-school culture (Lacey, 1970; Hargreaves, 1967). Streaming is also found to reinforce prior differences in terms of social class and ethnicity since working-class and ethnic minority students are more likely to be allocated to lower stream classes (Oakes, 1990, 2005; Gamoran and Mare, 1989; Gamoran et al., 1995).

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[4]   Streaming is often referred to as tracking, especially in US research. Tracking, more properly, refers to the separation of groups of students into separate curricular programmes.

Other research has looked at ability grouping based on particular subjects, that is, setting. There is a consensus among studies across different national contexts and relating to different subjects that setting results in greater inequality in student achievement outcomes, but very little difference in average scores (Askew and William, 1995; Ireson et al., 2002; Leonard, 2001; Hoffer, 1992; Hattie, 2009; Betts and Shkolnik, 2000; Ireson et al., 2005). In all cases, those allocated to lower 'sets' achieve significantly lower grades. However, there is less consistency regarding the impact of the higher 'set', with (weak) positive effects reported in a number of studies (Hoffer, 1992; Ireson et al., 2005).

In the Irish context, the use of streaming has declined since the 1980s but is now more highly concentrated in schools serving disadvantaged populations (Smyth et al., 2004). A large nationally representative study of Junior Certificate students showed significant underperformance among those allocated to lower stream classes with no grade advantage accruing to those in higher stream classes (Smyth, 1999). Thus, moving away from streaming is likely to raise average achievement levels. Later longitudinal research replicated this finding and indicated the way in which underperformance among lower stream students reflects the interaction of low teacher expectations, slower pace of instruction and negative labelling (Smyth et al., 2007). Streaming is found to account for part of the social class gap in academic achievement; in other words, working-class young people achieve lower exam grades, at least in part, because they are more likely to attend schools where streaming is used and more likely to be allocated to lower stream classes in these schools (Smyth et al., 2007).

Although the use of mixed ability base classes in Irish second-level schools has increased over time, the majority of schools allocate students to 'set' groups for at least some subjects, generally Mathematics, Irish and English (and sometimes a foreign language) (Smyth et al., 2007, 2011). Research indicates a complex interaction between school policy regarding allocation to ability groups, teacher and student expectations in shaping the proportion of students who take higher level subjects (Smyth et al., 2007, 2011). Thus, setting is employed differently in different contexts – in some schools, all students are encouraged to take higher level while in others, access to the 'higher' set is strictly rationed on the basis of prior performance. This research provides strong evidence for moving away from rigid ability grouping in order to enhance achievement and reduce educational inequality. In the reformed junior cycle (discussed in greater detail below), the majority of subjects will be studied at a common level, thus removing some of the impetus for ability grouping. This is likely to enhance the potential achievement of young people. However, separate higher and ordinary levels will remain for Irish, English and Mathematics, the subjects in which setting is most commonly

used currently. The way in which allocation to higher and ordinary level is handled at the school and class level will therefore remain central to ensuring improved take-up of higher level.

Research has indicated that the majority of base classes in Irish second-level schools are now mixed ability in composition (Smyth et al., 2004). As noted, this does not necessarily translate into mixed ability teaching since setting is commonly used for some subjects. Again the issue of how mixed ability is implemented emerges as central. In mixed ability groupings, a significant proportion of second-level students (at both junior and senior cycle) report that the pace of instruction in class is too fast or too slow for them, indicating the need for teaching methods that cater for the diversity of students in the classroom (Smyth et al., 2007, 2011). Inspection reports also point to the need for a greater use of differentiation in teaching methods within second-level classes (DES, 2007, 2008). The use of differentiation to cater for the needs of all students in the class is all the more important in the context of increased diversity in the student population, reflecting the proportion of newcomer (immigrant) students and the mainstreaming of young people with special educational needs. There is an absence of research in Ireland on how best to use mixed ability teaching to cater for these different student needs and enhance educational development. Qualitative research conducted in the US by Boaler (2008; Boaler and Staples, 2008) provides very useful insights into how some high school teachers used mixed ability grouping to promote peer learning and deeper understanding of mathematics in a way that yielded higher (and less unequal) achievement levels than students attending 'traditional' Mathematics classes. Such research could usefully provide a basis for further study of how mixed ability teaching operates across different subjects and year groups in Irish schools.

2.1.2   The Social Climate of the School

Two syntheses of international research (Martin and Dowson, 2009; Jennings and Greenberg, 2009) highlight the importance of relationships in student engagement. There is a strong body of evidence that supportive teacher-student relationships have positive effects on student academic and social-emotional outcomes, and are key to an effectively managed classroom (see also Crosnoe et al., 2004; Opdendakker et al., 2011). Teacher expectations can influence their behaviour towards students as well as the pace of instruction and thus student motivation and outcomes. Warm and supportive teachers provide students with the security to explore new ideas and take risks. 'Connective instruction' (also termed 'relational pedagogy'), where students feel supported and cared for by their teacher, is associated with enhanced motivation and achievement (Martin and Dowson, 2009). In Ireland, the cross-sectional PISA study indicates that

reading literacy scores are higher in schools with better teacher-student relations (OECD, 2010), though it is difficult to interpret this relationship as causal. Longitudinal research provides a more robust way of isolating the impact of teacher-student interaction on young people as they move through the school system. In the Irish context, such research indicates that the quality of student-teacher relations has a significant effect on a range of student outcomes, including academic performance, early school leaving, academic self-image (that is, how students view their own capacity to cope with schoolwork) and planned post-school pathways. Students who experience negative interaction with their teachers (that is, those who are frequently 'given out to' or reprimanded) achieve lower exam grades, are more likely to drop out of school and are less likely to intend to go on to higher education, all else being equal (Smyth et al., 2011). More negative disciplinary climates are found in schools serving disadvantaged populations (Smyth et al., 2007; Gilleece et al., 2009) and in larger classes (Gilleece et al., 2009).

National and international research has provided a clear message that teacher-student relations matter a great deal for student outcomes. However, less is known about how to bring about a more positive social climate in the school. Existing studies point to the lack of a positive impact from more punitive measures, such as suspension from school (Blomberg, 2004; Fenning and Bohanon, 2006; Skiba and Peterson, 2000). Such approaches may, in fact, serve to further alienate students, culminating in disengagement or early school leaving (Skiba and Rausch, 2006; Slee, 1999). Research in Ireland shows that some young people, particularly working-class boys, become caught up in a cycle of being 'given out to' by teachers and 'acting up' in response, with lower levels of achievement and higher drop-out rates among this group of students (Smyth et al., 2004, 2011; Byrne and Smyth, 2010). A disruptive class where students found it difficult to learn also emerged as a factor in early leaving (Byrne and Smyth, 2010). How student behaviour is handled therefore appears central to reducing educational inequality and enhancing retention and achievement. Existing evidence points to the role of a 'strict but fair' climate, applied consistently across the school, and measures that emphasise positive behaviour rather than negative sanction (Rutter et al., 1979; Smyth, 1999; Blomberg, 2004; Skiba and Peterson, 2000). Interventions designed to emphasise positive behaviour have been introduced in many US schools, with one randomised controlled trial indicating a reduction of over a third in the referral of discipline problems to the principal (Bradshaw et al., 2009). Providing engaging learning opportunities to students is also found to reduce the incidence of misbehaviour (Osher et al., 2010).

2.2   Teacher Effects

A large number of research studies have indicated that student outcomes, especially academic achievement, vary according to their teacher (Day et al., 2007). At primary level, it is generally easy to isolate the effects of teachers and schools since children usually have one main class teacher. Teacher 'effects' are found to be larger than primary school effects, and larger in some subjects (such as Mathematics) than others (Nye et al., 2004); the latter study also suggests that teacher effects are stronger in schools catering for a greater proportion of students from lower socio-economic backgrounds, while Aaronson et al. (2007) suggest greater effects for lower ability students. In second-level schools, it is more difficult to disentangle the effect of individual teachers as students are taught by many different teachers. Many studies have pointed to considerable variation in academic achievement levels across different subjects within second-level schools (Goldstein et al. 1993; Luyten, 1994; Thomas et al., 1997). Others, however, have pointed to school effects as being substantial, in some cases being on a par or larger than teacher effects (Opendakker and Van Damme, 2000). It is likely that the relative importance of teacher, classroom and school effects is cross-nationally variable, reflecting differences in school structure, the use of ability grouping and the degree of teacher autonomy (see Teddlie and Reynolds, 2000). It can be concluded therefore that both schools and teachers matter in shaping student outcomes within second-level education.

2.2.1   Teacher Characteristics

How teachers matter has been the subject of debate: "Although there is general agreement that teachers make a difference, there is a lack of consensus about which aspects of teachers matter most" (Palardy and Rumberger, 2008, p. 112). Studies can be classified as those which assess the impact of teacher characteristics and/or those which look at instructional practices. Findings on the effect of teacher qualifications are inconsistent. Where studies have found some effects, they have generally been limited to a subset of outcomes (Nye et al., 2004; Palardy and Rumberger, 2008). It should be noted, however, that in Western countries there is unlikely to be very significant differences in the level of teacher qualifications. There is a lack of evidence on the impact of different types (rather than levels) of teacher qualifications. However, a review of research by Wayne and Youngs (2003) indicates that students make more progress in Mathematics when taught by teachers who had more Mathematics training in their degree. A German study (Baumert et al., 2010) points to the need to distinguish between the teacher's content knowledge ('knowing the subject') and their pedagogical content knowledge ('knowing how to teach the subject'), finding the latter to be a strong influence on student achievement in Mathematics. There has been no Irish research to date on the effect of teacher

qualifications on second-level student outcomes, although there has been recent media debate on the extent to which Mathematics teachers have relevant specialist qualifications.

As with teacher qualifications, findings on the impact of teacher experience (number of years teaching) tend to be non-significant (Day et al., 2007; Palardy and Rumberger, 2008) or limited to a subset of outcomes (Nye et al., 2004). In a study of Chicago public schools, Aaronson et al. (2007) concluded that the vast majority of between-teacher variance is not explained by traditional characteristics; tenure and qualifications explain, at most, one per cent of the variance. Other factors such as being positive about professional practice and support (professional identity), and feelings of self-efficacy, are found to be associated with teacher effectiveness (Day et al., 2007). The vast majority of research on teacher effects has focused on differences in the way in which they teach, an issue we discuss in the following subsection.

2.2.2   Teaching Methods

Recent years have seen considerable debate internationally about the kinds of teaching methods which enhance student engagement and learning. The fault-lines have been crudely characterised as the conflict between 'teacher-centred' and 'student-centred' methods. There has also been a good deal of inconsistency in the terminology used: 'student-centred' approaches have been described as 'constructivist', 'active learning', 'experiential' and 'inquiry-based learning'. 'Teacher-centred approaches' have been described as 'didactic', 'transmission teaching' and 'direct instruction', though the latter term is sometimes used to describe the use of a range of approaches which *combine* whole-class teaching with small group and individual work (Muijs and Reynolds, 2011). Given the lack of consistency in concepts and terminology, it is not surprising that studies have reached very different conclusions about the effect of different teaching methods on student outcomes. Some research, usually at primary level, shows greater achievement gains where teachers use direct instruction (Nye et al., 2004; Stringfield et al., 1997; Galton, Simon and Croll, 1980). A recent study showed that direct instruction classes had higher achievement than constructivist classes, although the data used were cross-sectional in nature, making it hard to determine whether this was a causal effect (Gales and Yan, 2001). In contrast, in an experimental study in Korea, Kim (2005) found that constructivist teaching methods had a stronger effect on achievement than traditional methods (for similar findings in Singapore, see Nie and Lau, 2010).

Much of the debate has been quite polarised, asserting the superiority of one method over the other. However, other researchers have argued that teachers often use a broad repertoire of methods and it is important therefore to identify elements of good practice (which are not necessarily mutually exclusive) (James and Pollard, 2010). On this basis, there is some consensus that certain kinds of approaches enhance student outcomes; all of these elements emphasise the active engagement and interaction of the learner, although this may occur in different contexts (including whole-class teaching). These include the following elements:

- Goal Setting: The teacher setting clear goals for the lesson at the outset is found to enhance achievement (Mortimore et al., 1988; Creemers and Kyriakides, 2008).

- Classroom Focus: A less disruptive and more focused classroom fosters more time on task, thus enhancing student progress (Brookover et al., 1979; Scheerens and Bosker, 1997; Teddlie and Stringfield, 1993).

- Challenging Material: An emphasis on providing challenging material to students, using higher order (open) rather than procedural (or factual) questioning and discussion, is associated with enhanced achievement (Nystrand and Gamoran, 1991; Camburn and Han, 2008; Yair, 2000; Mortimore et al., 1988; Rosenshine et al., 1996). Applebee et al. (2003) found that discussion-based approaches enhance learning gains across all achievement levels in English literacy, especially in the context of high academic demands. These approaches provide room for the exploration of ideas, which is necessary for the development of deeper understanding.

- Active Engagement: The active engagement of students in practical investigation is found to enhance conceptual understanding of, and achievement in, science (Minner et al., 2010).

- Group-Work: Cooperative learning and peer tutoring through small group-work enhance achievement (Kamps et al., 2008; Topping, 2005; Scheerens and Bosker, 1997; Veenman et al., 2005; Webb and Mastergeorge, 2003; Galton et al., 2009). Cooperative learning is found to be more important than competitive approaches for learning, especially in developing higher order thinking and problem solving (Slavin, 1983).

- Formative Assessment: The use of assessment for learning (formative assessment) enhances learning (James and Pollard, 2010).

- Expectations: Teacher expectations have a strong impact, with, for example, lower reading achievement gains where teachers hold negative expectations (e.g. view children being incapable of learning) (Palardy and Rumberger, 2008; Brookover et al., 1979; Teddlie and Stringfield, 1993).

There appears to be a consensus favouring active teaching and learning methods among young people in very different national settings, with studies of student perspectives indicating their desire for greater discussion and interaction in class (for example, EPPI, 2005; Gorard and See, 2011; Osler, 2010; Lumby, 2011). In keeping with the discussion of the importance of teacher-student relationships above, the quality of the interaction with teachers is seen as key to student learning. Students appear to respond to teachers who they feel trust them, give them more responsibility, care about them, are patient with them, encourage them to do their best and treat them with respect (see, for example, Hallinan, 2008).

There is a lack of systematic evidence on the use of different teaching methods at post-primary level in Ireland and the extent to which the methods used vary across year groups, subject areas and different groups of students. However, insights can be gleaned from the Teaching and Learning International Survey (TALIS) report, where the pattern in Ireland can be placed in international context (Gilleece et al., 2009). As in other countries, Irish teachers (at junior cycle level) have more positive attitudes to constructivist (student-centred) methods than to direct transmission (where teachers do most of the talking). However, compared with those in other countries, teachers in Ireland were more likely to use a highly structured (and teacher-centred) approach and much less likely to use student-centred activities. Variation is also evident by subject area, with Mathematics being taught in a more structured way than other subjects. More student-centred practices are used with higher ability students and are less prevalent in larger classes (Gilleece et al., 2009). Teacher reports of the methods used with first year students indicate that classrooms tended not to be interactive (in terms of teacher-student and student-teacher questioning), students were rarely given the opportunity to suggest topics to be covered, and group-work was relatively infrequent (Smyth et al., 2004). Student reports of classroom practices further indicate the continuing reliance on teacher-centred approaches in second-level classrooms, with exam years in particular characterised by teachers doing most of the talking, less use of group work, less active student involvement and an emphasis on practising previous examination papers (Smyth et al., 2011). Inspection reports have also highlighted the dominance of teacher talk and an over-emphasis on learning through memorisation in some subjects (DES, 2007, 2008).

In conclusion, there is considerable debate about the most effective teaching methods but some consensus that more active engagement of the learner enhances outcomes, especially the development of deeper understanding. There is a paucity of research on teaching practices in Irish second-level education, but

existing evidence suggest that approaches tend to be teacher-centred. Further research could greatly enhance our understanding of the link between curriculum and teaching in specific subjects.

2.3   Curriculum and Assessment

The discussion so far has focused on school processes independently of the issue of what is taught (curriculum) and how we know what students have learned (assessment). Indeed, Teddlie and Reynolds (2000) have acknowledged that research on school effects has tended to take the existing curriculum as given. In Ireland, potential reform of junior and senior cycle education has been on the agenda for some time. Research clearly indicates that the current Junior and Leaving Certificate models tend to narrow the range of student learning experiences and to focus both teachers and students on 'covering the course' (Smyth et al., 2007, 2011). The Post-Primary Longitudinal Study points to a number of elements which should be considered in any curriculum reform: ensuring continuity between primary education, junior and senior cycle in the standards expected of students; moving away from the very detailed content of many subjects, which currently appears to contribute to a pace of instruction not always conducive to student learning and to a more teacher-centred approach rather than the kinds of active teaching methods which students find most engaging; the need to embed key skills, such as critical thinking, learning to learn and ICT skills, in the curriculum in order to equip young people for the future; a consideration of the possibility of making work experience available to all students, regardless of the programme they take; the crucial role of school climate, especially positive teacher-student relations, in student engagement; and the need to move to a broader range of assessment modes, which reflect the full range of skills and knowledge developed within schooling. Such a shift in approach is likely to enhance student engagement and provide young people with richer educational experiences as a preparation for adult and work life.

The junior cycle reform to be implemented from 2014 onwards represents a sea-change in the nature of Irish second-level education. It involves a shift away from an exam-dominated mode of assessment, less detailed curriculum specifications, fewer subjects to be assessed than currently, a focus on embedding key skills in teaching and learning, and a concern with more innovative approaches to teaching and learning (NCCA, 2011). In implementing this reform, there are lessons to be learned from the experience of the Primary School Curriculum (Government of Ireland, 1999). An emphasis on the student as active learner is strongly reflected in the Primary Curriculum but existing evidence indicates that whole-class teaching remains the dominant approach used in the classroom, with less use of group work and the more active methodologies than had been

envisaged in the Curriculum document (NCCA, 2005, 2008; McCoy et al., 2012b). The success of the junior cycle reform will therefore crucially depend on the professional development and planning support provided to schools and teachers in implementing the new junior cycle curriculum.

There are other challenges in successful curriculum implementation. Firstly, the number of subjects to be assessed will be reduced to eight. While schools are free to offer a larger number of subjects, recent experience points to a close link between what is assessed and what is taught. Depending on how schools organise subject choice, there is a risk of differential student access to a broad range of subject areas, an issue which has important implications for later options at senior cycle and in post-school education. Secondly, to date the Transition Year programme has been the only outlet for teachers to engage in course design. This experience has been useful in prompting the tailoring of courses to meet local student needs (Smyth, Byrne and Hannan, 2004; Jeffers, 2007) but the new junior cycle will require a new set of skills for many teachers. Once again, initial and continuing teacher education can play an important role in developing these skills. Finally, the junior cycle document envisages a more interactive learning environment with young people playing a more active role in their own learning. Currently, second-level education in Ireland can be characterised as quite hierarchical in nature (Lynch and Lodge, 2002). The more active engagement of young people will therefore require greater student involvement in the operation of the school. Even more crucially, effective curriculum implementation will require a significant broadening of the repertoire of teaching and assessment methods used in the classroom, which necessitates a strong emphasis on continuous professional development for teachers. Systematic evaluation of the new junior cycle programme will be crucial in assessing how these challenges play out at the school and classroom level.

The consequences for the quality of Irish education will also depend on the extent to which innovations at junior cycle are followed through into senior cycle education (and beyond). Without senior cycle reform, young people will move from a richer and engaging learning experience to a narrower one focused on the terminal exam. There is also a danger that even though assessment approaches will become more varied at junior cycle, the high-stakes nature of the Leaving Certificate will (continue to) have a 'back-wash' effect on earlier stages.

3. CONCLUSIONS AND IMPLICATIONS FOR POLICY

Investment in education is perhaps unique in having the potential to impact on generations to come. In the context of scarce resources, it is all the more important that decisions in relation to expenditure allocations should be guided by the existing evidence base. The relationship between research and policy-making in Ireland has rarely been explicitly analysed. Historically, the *Investment in Education* (1966) report amassed considerable evidence on social and geographic inequalities in educational participation, evidence which prompted the introduction of free second-level education. More recently, two contrasting cases of the research-policy relationship are evident, with one approach focused on understanding processes and the other on assessing outcomes. The Post-Primary Longitudinal Study, conducted by the ESRI and funded by the NCCA and the DES, yielded a significant body of evidence on the processes which influence second-level students as they move through the schooling system, and provided an explicit evidence base for junior cycle reform (see NCCA, 2011). In the second example, evidence on outcomes, namely, Ireland's poor performance in the PISA achievement tests, prompted the development of the National Literacy and Numeracy Strategy (DES, 2011).

We can potentially learn a lot from what other educational systems have 'got right' and from the measures that have not succeeded. However, it is vital that, in drawing on such evidence, we do not fall into the trap of advocating 'policy borrowing'. The nature and structure of national educational systems reflect a multiplicity of historical, social, cultural and economic factors, making it impossible to 'transplant' certain measures from one country to the other. We can, however, usefully engage in 'policy learning', by reflecting on existing international research and policy development through the specific lens of the Irish educational system and its societal context. Irish research can provide a further basis for assessing 'what works' in terms of school organisation and process.

This paper has presented evidence on aspects of schooling which can enhance student outcomes, not only academic achievement but engagement, retention and social-personal development. There is robust research which shows that rigid forms of ability grouping (streaming) have a significant and large negative impact on student achievement for those allocated to lower stream classes without any corresponding gains for those allocated to higher stream classes. Moving away from streaming will therefore enhance average student achievement and play a part in reducing the social inequality in educational outcomes resulting from the disaffection found among working-class boys in lower stream classes. There are challenges, however, in catering to the heterogeneous needs of students within a

class, with a significant proportion of second-level students currently reporting difficulties with the pace of instruction. Investment in continuous professional development for teachers to support effective differentiation is therefore likely to significantly enhance student achievement.

There is robust evidence too that the nature of the school climate, that is, day-to-day interactions between teachers and students, significantly influences a range of student outcomes, including early school leaving, academic achievement, academic self-image, stress levels, and intended post-school pathways. Furthermore, students see care and respect on the part of teachers as key to effective teaching and learning in the classroom. The school disciplinary policy is an important lever for school climate; Irish research (in keeping with evidence from other countries) indicates that punitive measures can actually fuel a cycle of misbehaviour and disengagement while international research points to the value of positive behaviour policies in bringing about a climate of respect. It is vital that the creation of a positive climate be seen as a central component of school development planning. Again, investment in continuous professional development for principals and teachers is likely to facilitate change; initial teacher education should also emphasise school and classroom climate as many new teachers may not realise the impact they actually have on their students.

The junior cycle reform being introduced from 2014 will represent a very significant shift in educational policy and practice. It promises, *inter alia*, an emphasis on the kinds of active teaching and learning methods which second-level students find engaging and much more flexibility at the school level to engage in course design. The success of the reform will ultimately depend on the extent to which principals and teachers are supported in acquiring the skills to develop their practice in this way. Its impact on the skills and competencies young people acquire will also depend on the degree to which similar changes are brought about within senior cycle education.

In conclusion, the paper has highlighted three features which can make an appreciable difference to student outcomes – moving away from rigid ability grouping coupled with high expectations of all students, promoting a positive school climate, and providing active and engaging teaching and learning in the classroom. Effective investment in teacher education, both initial and continuous, is therefore a priority for resource allocation.

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