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Chapter 5
Teachers and teaching practices

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Introduction

Primary teachers are responsible not only for interpreting and implementing the Primary School Curriculum but also for supporting pupils' academic and social development and wellbeing on a day-to-day basis. The importance of this role is reflected in the generally positive public perception of the teaching profession (Teaching Council, 2010). It is also acknowledged quite clearly in Curriculum documentation, where the introduction notes that "the quality of teaching more than anything else determines the success of the child's learning and development in school" (DES/NCCA, 1999, p. 20). This recognition is accompanied by a reminder of the teacher's responsibility to create a rich learning environment through:

- varied methods of classroom organisation
- wide use of strategies and resources (including parents, colleagues, and available information and communication technologies [ICT])
- an awareness of developments in educational theory and best practice
- and a commitment to continuing professional reflection and development (DES/NCCA, 1999, p. 21).

Much research has been directed at the teacher behaviours and classroom teaching practices that might lead to high achievement outcomes for pupils (see, e.g., Conway & Murphy, 2013; Darling-Hammond, 2000; Gorard, 2013; Teodorović, 2011). This chapter draws on the data collected in PIRLS and TIMSS 2011 (PT 2011) to examine some of these issues. However, it is also worth taking a step back, to consider what characteristics make a "good teacher", how one person flourishes in the role while another suffers from burnout, and, more broadly, some general demographic characteristics of the profession.

In Ireland, as in many other countries, a majority of classroom teachers are female. The most recent figures show, for the 2011/12 school year, that 86% of primary teachers in Ireland were women (DES, 2012b). A similar pattern is evident in most other developed countries (Drudy, Martin, Woods, & O'Flynn, 2005; European Commission/EACEA/ Eurydice, 2013). In contrast, women tend to be underrepresented at school management level globally (Drudy et al., 2005) and in Ireland (INTO, 2004; OECD, 2007). Despite the relative scarcity of male teachers, the evidence suggests little or no association between teacher gender, or teacher-pupil gender match, and pupil achievement (Drudy, 2008; Neugebauer, Helbig, & Landmann, 2011).

Many primary teachers in Ireland are relatively young, and are still in the early stages of their careers. Eivers et al. (2010) found that 16% of Second class pupils (but only 5% of those in Sixth class) were taught by a teacher in the first two years of their teaching career. Similarly, data from Growing Up in Ireland (GUI) showed that almost two-fifths of nine-year-old children were taught by teachers aged 29 or under, and a further one-fifth taught by teachers aged between 30-39 (Williams et al., 2009). The relatively youthful profile of Irish primary teachers has some implications for classroom practice, as outlined next.

A consistent finding of recent studies is that the use of ICTs (computers, interactive whiteboards, and even calculators) in Irish primary school classrooms is uneven, and substantial percentages of pupils never or very rarely use ICT in school (Eivers et al., 2010; Gilleece, Shiel, Clerkin, & Millar, 2012; McCoy, Quail & Smyth, 2012). The limited availability of resources – and associated infrastructural considerations such as access to a high-speed broadband connection – is one often-cited reason for high reliance on more traditional resources such as textbooks and curriculum documents. However, Cosgrove and Marshall (2008) found that teachers under 30 were more likely to use ICT in the classroom, suggesting that access is by no means the only inhibiting factor. Further, many of the teachers surveyed by Eivers et al. (2010) rated the use and integration of technology in the classroom as a priority topic for continuing professional development (CPD). Thus, it seems that teacher confidence in using ICT in the classroom is at least as important as quality access to ICT, and that younger teachers may feel slightly more confident than older teachers in this regard.

The 2009 National Assessments (Eivers et al., 2010) showed that Irish classrooms at Second and Sixth class levels are predominantly characterised by whole-class teaching and by pupils working by themselves (rather than in pairs or in small groups), as well as by the use of textbooks, reading schemes, and workbooks. These findings suggest that constructivist teaching approaches in the classroom remain relatively rare compared to more "traditional" methods of instruction. Devine, Fahie and McGillicuddy (2013) reported a similar finding based on direct classroom observations, and noted teachers' concerns – particularly among teachers in DEIS schools – that frequent use of active learning methods could have a negative impact on classroom discipline. That aside, more "active" or constructivist teaching methods, such as encouraging pupils to ask each other questions in class and providing pupils with opportunities to engage in hands-on activities, are also more common among less experienced – usually younger – teachers (Devine et al., 2013; McCoy, Smyth, & Banks, 2012). Differences in approach by teaching experience may reflect changes in Initial Teacher Education programmes in recent years, or it may be a function of teaching experience itself.

As noted in the introductory paragraph, the Curriculum places a responsibility on teachers to engage in a variety of activities (e.g., professional development, developments in educational theory and best practice) in order to ensure that they, and their teaching practices, are up to date. In many regards, efforts to remain up to date are particularly important for teachers in Ireland. Many work in very small schools, have few work colleagues with whom to share practice, and tend to change employment infrequently. Despite this, teacher certification in Ireland is not linked to participation in CPD, a situation highlighted by Eivers et al. (2010) in relation to the low uptake of CPD related to either literacy or numeracy.

Teachers' commitment to their profession is another important, yet often overlooked aspect of teaching. Arising from dissatisfaction with their working conditions, career dissatisfaction, poor collegial relationships, or negative perceptions of pupils, lower levels of commitment can lead to burnout, or to opting out of the teaching profession altogether. This not only has personal cost to individual teachers, but also considerable system cost, as substantial time and resources will have been invested in their training (OECD, 2005). In addition, pupils whose teachers report low commitment to the profession are found to perform at a lower-than-expected level on achievement tests (Day, 2008).

Collie, Shapka, and Perry (2011) found that Canadian primary school teachers who perceived their pupils to be more motivated to learn and better-behaved reported greater commitment, both to the teaching profession generally and to their particular school. The authors suggest that this may be because teachers whose pupils are more motivated and engaged experience less work-related stress and greater job satisfaction, thereby reinforcing

their commitment to teaching. Similar observations have been made in the UK (Day, 2008) and in Ireland, where Morgan, Ludlow, Kitching, O'Leary, and Clarke (2010) noted that positive experiences in the classroom play a relatively more important role than negative experiences in fostering teachers' sense of commitment, as well as teaching efficacy (that is, how well and how effectively they feel able to teach). Examples of positive experiences reported by teachers include seeing children engage well with the material they are learning, and seeing pupils make progress or display their proficiency in a particular area (Kitching, Morgan & O'Leary, 2009).

Professional collaboration among teachers within a school also tends to support commitment, and can be particularly positive for new or recently-qualified teachers (Williams, Prestage, & Bedward, 2001). Good working relationships and the exchange of ideas among teaching staff can be useful in terms of classroom practice – for example, by discussing teaching strategies – and by creating a supportive and collegial atmosphere (Collie et al., 2011; Gu & Day, 2013). In contrast, poor relationships with colleagues can undermine teachers' resilience (Gu & Day, 2013), further emphasising the importance of a positive and professional working environment to effective teaching. In Ireland, Cannon and Moran (1998) reported high levels of collegiality among their sample of teachers in Donegal, but note that although most teachers reported that they would like to observe colleagues' classroom teaching and offer feedback, this happened only rarely in practice.

The remainder of the chapter is presented in three main sections. The first section describes the teachers who took part in the study in Ireland, with some comparison to their peers internationally. Characteristics covered include age and qualification, as well as teachers' career satisfaction, working conditions, professional development, and collaboration with other teachers. The second section focuses on the day-to-day activities of Fourth grade (internationally) and Fourth class (in Ireland) teachers. Topics discussed include teaching practices and behaviours in the classroom, homework, and the use of ICT in the classroom. In the final section, some key findings and over-arching themes are discussed.

As was noted in Chapter 1 (Eivers & Clerkin, 2013), data from the Teacher Questionnaire are reported at the *pupil* level, because the PT 2011 sample was selected to be representative of pupils, not their teachers (see Rutkowski, Gonzalez, Joncas, & von Davier, 2010 for a good discussion of this and other associated issues). This means that the focus of the chapter is on what pupils experience in Irish classrooms, rather than on how many teachers engage in particular practices with their own class.

Readers who would like more background information on PIRLS and TIMSS, or about Ireland's participation in PIRLS and TIMSS in 2011 are referred to Chapter 1 of this volume (Eivers & Clerkin, 2013).

Teacher characteristics

This section is divided into seven parts. The first part describes some of the basic characteristics of Fourth grade teachers, both in Ireland and throughout other countries participating in PT 2011, while the second deals with teachers' qualifications. In the third part, career satisfaction is considered, followed by teachers' reports of working conditions. The final three parts turn to matters related to professional practice – in turn, teachers' confidence teaching mathematics and science, followed by their participation in CPD and, finally, the extent to which they collaborate with other teachers.

Gender and age

Across PIRLS and TIMSS, a large majority (at least 80%) of Fourth grade pupils were taught by female teachers. In Ireland, primary school teaching also appears to be a femininised profession, but to a slightly lesser extent than in most PT 2011 countries. Here, 71% of Fourth class pupils were taught by female teachers. While Eivers et al. (2010) found that almost all (91%) of the Second class pupils in NA 2009 were taught by female teachers, the 69% of Sixth class pupils taught by female teachers is broadly in line with the gender balance observed in PT 2011. As was found also in NA 2009, teacher gender was related to school gender composition. Almost all pupils (91%) in all-girls schools were taught by female teachers, whereas in all-boys schools, relatively fewer pupils (55%) were taught by females. While most class teachers were female, school principal posts in Ireland were almost evenly divided between males (48%) and females (52%).

Teachers of Fourth class pupils in Ireland tend to be relatively less experienced than their counterparts in other countries. The average (mean) length of time for which Irish pupils' teachers had been teaching at the time of PT 2011 is slightly more than 12 years, compared to 17 years across all PIRLS and TIMSS countries. The Irish data are broadly in line with data from NA 2009, where average experience was 11 years for Second class and 16 years for Sixth class teachers (Eivers et al., 2010). Only a small number of other countries had less-experienced Fourth grade teachers, including England, Singapore, and New Zealand from our key comparison countries. Across both PIRLS and TIMSS, only two countries (Oman and Kuwait) had a teaching force that averaged less than 10 years of teaching experience. With an average of 26 years, Armenia had the longest-serving teachers, closely followed by a number of other post-Soviet or Eastern bloc states (Bulgaria, Hungary, Lithuania, and the Russian Federation).

Another way of looking at teacher experience is to examine the median length of service – the halfway point when all responses are ranked in order (or, the 50th percentile). In Ireland, the median length of experience was eight years. In other words, about half of Fourth class pupils were taught by teachers who have been teaching for less than eight years (and half for more than eight years). England, New Zealand, Singapore and the United Arab Emirates also report a median experience of eight years, which is the lowest figure reported for any country. Across all PIRLS countries, the median length of time teaching is slightly more than 16 years.

The relatively short length of service of Irish teachers in comparison to other countries may be related to their generally youthful profile (Table 5.1). Ireland, along with the Netherlands, had the highest percentage of pupils (11%) taught by teachers who are less than 25 years old (international averages: 3%). Ireland was also one of 12 countries where no more than 11% of pupils were taught by teachers aged 50 or over – much lower than the international averages of 25%.

Most Irish pupils (59%) were taught by teachers aged from 25-39, compared to about 41% of Fourth grade pupils internationally. In contrast, relatively few Fourth grade pupils were taught by teachers under 40 in Italy (10%), Poland (12%), Bulgaria (15%), and Hungary (17%). Among our selected comparison countries, Fourth grade teachers in England have the closest age profile to Fourth class teachers in Ireland.

Specific to Ireland, some differences were apparent in teacher age by school DEIS status. Relatively few pupils in DEIS Urban schools were taught by older teachers. While one-third of pupils (33%) in non-DEIS schools and 44% of pupils in DEIS Rural schools were in classes with a teacher aged 40 years old or more, the equivalent percentages in Urban schools were just 16% (Band 1) and 5% (Band 2). This largely mirrors teachers' age distribution by the area in which their school is located. For example, in schools in areas

where the population exceeds 500,000 (i.e., Dublin), only 6% of Fourth class pupils were taught by teachers aged 40 or over. In contrast, in schools in areas with a population of 3,000 or fewer (i.e., rural schools), 46% of pupils were taught by teachers aged 40 or over.

Table 5.1: Percentage of pupils taught by teachers of varying ages Ireland, comparison countries and study averages

	Under 25	25-29	30-39	40-49	50-59	60+
Australia	8	10	21	23	34	4
England	9	26	27	23	14	1
Finland	1	9	19	38	29	3
Hong Kong SAR	1	12	53	27	6	2
Ireland	11	29	30	19	10	1
Korea, Rep.	2	20	33	25	17	3
New Zealand	7	15	32	21	23	2
Northern Ireland	3	16	35	25	20	1
Russian Fed.	1	2	23	43	23	8
Singapore	3	22	44	20	8	4
United States	2	10	33	27	21	7
PIRLS	3	11	30	32	21	4
TIMSS	3	11	31	30	21	4

Qualifications

With regard to teachers' qualifications, more than 97% of Irish Fourth class pupils were taught by a teacher who had completed at least an undergraduate third-level degree, with18% taught by teachers who had also completed a postgraduate degree. The small number of teachers who were not qualified to degree level reported between 37 and 41 years' experience, and so may be described as "teachers holding diploma qualifications from prior to the establishment of degree requirements [who] are recognised as qualified teachers within the school system" (Coolahan, 2003, p. 38). For comparison, Second and Sixth class teachers in the National Assessments were not asked about their highest qualification, but were asked whether they were fully-qualified, not qualified, or in training. All pupils, at both grade levels, were taught by fully-qualified primary teachers. Between one-third and one-half of pupils in NA 2009 were taught by teachers who also reported an additional qualification related to their work as a teacher (e.g., an M.Ed. or diploma), slightly higher than the postgraduate degree data reported here.

The international average for Fourth grade teachers in PT 2011 was that 79% of pupils were taught by teachers with at least an undergraduate qualification, while 21% were taught by teachers who reported a lower level of education. About 25% of pupils internationally were taught by teachers who held a postgraduate degree. A relatively greater percentage of pupils in Ireland than internationally, therefore, are in classes where the teacher has attained at least an undergraduate degree, but relatively fewer pupils' teachers possess a postgraduate degree in Ireland.

Particularly high percentages (greater than 60%) of pupils taught by postgraduate-qualified teachers were reported in ten countries, most notably the Slovak Republic (99%), Poland (96%), the Czech Republic (93%), Finland (82%) and Russia (79%). It should be noted that in some countries (e.g., Czech Republic, Finland), specialised third-level teacher training programmes are considered to be equivalent to Master's level. In Ireland, in contrast, the specialised primary school teacher training degree (B.Ed.) is an undergraduate

programme, while holders of a non-teaching primary degree can qualify as teachers following completion of a specialised postgraduate diploma. Readers are referred to the PIRLS and TIMSS Encyclopedias (Mullis, Martin, Minnich, Drucker, & Ragan, 2012; Mullis, Martin, Minnich, Stanco et al., 2012) and to Chapter 2 of this volume (Lewis & Archer, 2013) for more detailed information on participating countries' education systems, including teacher training and teaching qualification requirements.

Teachers in PT 2011 were also asked to provide more detail on the *major or main* area(s) of study during their third-level education (Table 5.2). Most pupils in Ireland (92%) were taught by teachers who described primary education as being their major area of study, with 5% taught by teachers who named secondary education as the main area. The corresponding averages for all PIRLS and TIMSS countries were 79% and 77%, respectively, for primary education, and 13% in both studies for secondary education.

A minority of pupils internationally were taught by teachers who reported that mathematics or science were main areas of study (28%, for both domains), although the percentages were even lower in Ireland (9% and 8%). Greater numbers were taught by teachers who reported a major in the test language[1] and in other, unspecified, areas. Large percentages of pupils in Singapore were taught by teachers who reported that they had specialised in mathematics or science, although the high percentages claiming each of mathematics, science, languages, and "another area" as being *major or main* areas of study suggests that these figures should be interpreted with some caution.

Table 5.2: Percentages of pupils taught by teachers indicating their *major or main* areas of study during third-level education, Ireland, comparison countries and study averages

	Primary education	Secondary education	Maths	Science	Language of test	Another area
Australia	94	6	8	7	14	27
England	82	4	15	26	33	42
Finland	93	–	2	1	3	16
Hong Kong SAR	80	28	56	27	78	54
Ireland	92	5	9	8	19	42
Korea, Rep.	96	3	2	1	1	10
New Zealand	94	1	8	9	18	24
Northern Ireland	86	10	11	12	14	53
Russian Fed.	97	13	26	25	28	22
Singapore	65	10	52	47	56	51
United States	82	6	6	6	13	32
PIRLS	79	13	15	15	32	35
TIMSS	77	13	28	28	20	32

Rows do not sum to 100 as teachers could choose one or more responses to this question.

Figures in the "Maths" and "Science" columns, and in the "Korea" row, are drawn from TIMSS data. All other columns are drawn from PIRLS data.

Teachers who cited primary education as their main area of study were also asked if they had a specialisation in mathematics or science within education (e.g., if they had taken an elective course). These reported specialisations, taken in combination with the major or main areas of study shown in Table 5.2, provide a more nuanced view of teachers' mathematical or scientific education (Table 5.3).

[1] In Ireland, this was considered to be English.

The percentages of teachers in Ireland without a major/specialisation in mathematics or science are higher than the corresponding TIMSS international averages, but are broadly in line with the percentages in many of our comparison countries. The Russian Federation, Singapore, and Hong Kong are notable for the very high percentages of teachers who report specialisations in mathematics or science as well as primary education. Relatively high percentages of teachers in Singapore and Hong Kong also report majoring in mathematics (and in Singapore only, in science) *without* a major in primary education. It should be noted, however, that majoring in a subject does not necessarily suggest superior teaching of that subject (Greaney, Burke, & McCann, 1999).

Table 5.3: Percentages of pupils' teachers indicating specialisations in primary education and/or mathematics or science, Ireland, comparison countries and TIMSS study average

	Major in primary education			Major in primary education		
	Yes	Yes	No	Yes	Yes	No
	Maths specialisation			Science specialisation		
	Yes	No	Yes	Yes	No	Yes
Australia	14	81	1	9	84	2
England	17	65	2	25	50	7
Finland	13	80	0	15	79	0
Hong Kong	54	27	12	27	52	6
Ireland	14	78	0	11	81	1
Korea, Rep.	10	86	0	14	81	0
New Zealand	15	76	<1	13	77	1
N. Ireland	10	76	1	11	75	3
Russian Fed.	59	38	1	55	42	2
Singapore	54	14	11	43	21	15
United States	10	74	1	10	75	2
TIMSS	26	44	10	24	46	11

Rows do not sum to 100 as columns for "all other majors" and "no formal education beyond upper secondary" are not shown.

Career satisfaction

As part of the Teacher Questionnaire, teachers were asked to indicate level of agreement with six statements about their work as a teacher[2]. These were combined to form a *Teacher Career Satisfaction* scale.

Overall, Irish teachers expressed far higher levels of career satisfaction than teachers in most other countries. Over two-thirds (69%) of Irish pupils were taught by a *satisfied* teacher, compared to 54% of pupils internationally (Table 5.4). The percentage of pupils in Ireland who are taught by satisfied teachers is substantially greater than in almost all of our comparison countries, and most notably those in the Asia-Pacific region.

[2] Statements included "I am frustrated as a teacher" and "I do important work as a teacher". Full details of the scale are included in the three international reports on PIRLS and TIMSS (e.g., Mullis, Martin, Foy, & Drucker, 2012).

Table 5.4: Percentages of pupils' teachers in each *Teacher Career Satisfaction Scale* category, Ireland, comparison countries and study averages

	Satisfied	Somewhat satisfied	Less than satisfied
Australia	53	41	6
England	52	42	6
Finland	42	50	8
Hong Kong SAR	38	50	12
Ireland	69	29	2
Korea, Rep.	19	69	11
New Zealand	55	41	5
Northern Ireland	54	41	5
Russian Fed.	60	36	4
Singapore	35	54	11
United States	47	47	6
PIRLS	54	40	5
TIMSS	54	41	5

Table 5.5 shows information about career satisfaction within the Irish system. The high satisfaction among the teachers of the vast majority of pupils in DEIS Rural and Urban Band 1 schools is particularly striking (96% and 86% of pupils' teachers, respectively, were classified as *satisfied*). The very high satisfaction expressed by teachers in Rural DEIS schools is not explained by rurality alone. When examined by location, rural teachers generally are *satisfied* with their careers (76%), but not to as marked an extent as those in Rural DEIS schools. Some differences were also found by school patronage or ethos. While 68% of pupils in schools with a Catholic patron were taught by teachers satisfied with their career, this rose to 84% of pupils in schools with other forms of patron models.[3]

Table 5.5: Percentages of Irish pupils' teachers in each *Teacher Career Satisfaction Scale* category, by school DEIS status and patronage model

		Satisfied	Somewhat satisfied	Less than satisfied
DEIS	Urban Band 1	86	14	0
	Urban Band 2	40	55	5
	Rural	96	4	0
	Non-DEIS	68	30	2
Ethos	Catholic	68	30	2
	Other	84	13	3

In contrast to their generally positive sentiments, one-third of pupils in DEIS Band 1 schools – and a majority of pupils in Band 2 schools (56%) – were taught by teachers who *agreed a little* or *a lot* with the statement "I am frustrated as a teacher". Also, the teachers of 56% of pupils in Urban Band 2 schools agreed with the statement "I had more enthusiasm when I began teaching than I have now". The latter may be somewhat surprising, in light of the relatively youthful profile of Irish teachers noted earlier. However, when compared to

[3] Due to the small numbers of teachers working in non-Roman Catholic schools, and the sensitive nature of this measure, their responses have been combined to preserve anonymity.

the study averages, Irish teachers generally appeared to have lost less enthusiasm than teachers in most countries.

Working conditions

As part of PT 2011, teachers were presented with a list of potential difficulties in their working conditions (overcrowded classrooms, building in need of repair, too many teaching hours, lack of workspace, and lack of instructional materials or supplies) and were asked to rate the extent to which each was seen as a problem. The responses were combined to create an overall measure, *Teacher Working Conditions* (Table 5.6).

On this composite measure, 37% of Irish Fourth class pupils were in classrooms where their teachers reported *hardly any problems* with their working conditions, and 47% of pupils were in classrooms with *minor problems* only. The corresponding international averages for *hardly any problems* are 27% (PIRLS) and 26% (TIMSS), suggesting that a higher percentage of Irish pupils were in classes where teachers are generally satisfied with their working conditions. However, 16% of Irish pupils (and 25-27% internationally) are taught by teachers who report *moderate problems* with their working conditions. Among our comparison countries, *moderate problems* with working conditions were most likely to be reported in Korea and Hong Kong, and least likely in England and the US.

Table 5.6: Percentages of pupils' teachers in each *Teacher Working Conditions Scale* category, Ireland, comparison countries and study averages

	Hardly any problems	Minor problems	Moderate problems
Australia	43	38	19
England	44	46	10
Finland	20	62	18
Hong Kong SAR	16	57	28
Ireland	37	47	16
Korea, Rep.	14	49	36
New Zealand	33	50	17
Northern Ireland	35	49	16
Russian Fed.	24	54	22
Singapore	32	51	17
United States	47	42	11
PIRLS	27	48	25
TIMSS	26	47	27

The most common problem identified by Irish teachers was overcrowded classrooms (with 43% describing it as a *moderate* or *serious problem*, compared to approximately 31%, internationally). As was outlined in Chapter 2 (Lewis & Archer, 2013), with an average of 26 pupils, Irish classes were slightly larger than the study averages of 24 for PIRLS and 25 for TIMSS. Although class size and overcrowding are related, but not identical, constructs, this may partially explain why Irish teachers were more likely than the average to describe overcrowding as a problem. However, in a number of our comparison countries where average class size was larger than in Ireland, the percentage of pupils whose teachers raised overcrowding as an issue was much smaller (e.g., England [12%], New Zealand [20%], Singapore [21%], and Hong Kong [23%]). Comparison countries where teachers raised overcrowding as an issue to the same extent as did Irish teachers included Finland (37% of pupils' teachers saw it as a *moderate* or *serious* problem, despite an average class size of 21 pupils) and Korea (48%; average class size, 30 pupils).

The issue least likely to be rated as a *moderate* or *serious* problem by Irish teachers was too many teaching hours – regarded as problematic by the teachers of only 6% of Irish pupils, which is considerably lower than the international average of 26%. Across both PIRLS and TIMSS, in only five countries were teachers less likely than in Ireland to see too many teaching hours as a problem (Belgium [French-speaking], the Czech Republic, Finland, Lithuania, and Poland). Again, considering some of the characteristics of education systems outlined in Chapter 2 may help to contextualise teacher responses. With the exception of Belgium, all (including Ireland) had fewer instructional hours per annum than the PIRLS and TIMSS averages.

Table 5.7 shows Irish teachers' reports of working conditions, split by their schools' DEIS status and ethos. All pupils in DEIS Rural schools were in classes where the teachers reported *hardly any* or *minor* problems, whereas almost one-quarter of pupils in Urban (Band 1 and Band 2) schools were in classes where teachers had *moderate problems* with their working conditions. However, a substantial minority of pupils in Band 1 schools were also in classes with *hardly any problems*.

Teachers in multidenominational or Educate Together schools were among those most likely to report *moderate problems* with working conditions. Specifically, the teachers of a sizeable minority of pupils in multidenominational schools described *serious problems* with the school building (37%) and with classroom overcrowding (37%), compared to the teachers of just 9% and 11%, respectively, of pupils in schools under Catholic patronage.

Lack of instructional materials and supplies is identified as a particular problem in DEIS Urban schools, representing a *moderate* or *serious problem* for 15% of pupils in Band 1 schools and 39% in Band 2 schools. Classroom overcrowding is also reported as a *moderate* or *serious problem* by the teachers of 41% of pupils in Band 2 schools, and by the teachers of 45% of pupils in non-DEIS schools. Most pupils in DEIS Rural schools are taught by teachers who report relatively few problems with their working environment.

Table 5.7: Percentages of Irish pupils' teachers in each *Teacher Working Conditions Scale* category, by school DEIS status and patronage model

		Hardly any problems	Minor problems	Moderate problems
DEIS	Urban Band 1	44	34	23
	Urban Band 2	19	59	23
	Rural	58	42	0
	Non-DEIS	37	47	15
Ethos	Catholic	35	49	16
	Church of Ireland	79	21	0
	Multidenominational	50	13	37

Confidence teaching mathematics and science

Teachers were asked about their confidence with regard to several aspects of mathematics and science teaching (but not reading). These responses were used to calculate two overall measures, *Confidence in Teaching Mathematics* and *Confidence in Teaching Science*.

The percentage of pupils in Ireland whose teachers were confident in teaching mathematics is similar to the percentage internationally (Table 5.8). In contrast, Irish pupils are significantly more likely to be taught by a teacher who is only *somewhat confident* in teaching science (59% in Ireland compared to 41% across all TIMSS countries). The pattern of teacher responses in Northern Ireland and Australia was very similar. Teachers in all of our

comparison countries were more confident teaching mathematics than science, although Russian pupils, in particular, were extremely likely to have a teacher who is confident with teaching both domains.

Table 5.8: Percentages of pupils' teachers expressing different levels of confidence in teaching mathematics and science

	Mathematics		Science	
	Very confident	Somewhat confident	Very confident	Somewhat confident
Australia	76	24	43	57
England	73	27	63	37
Finland	62	38	32	68
Hong Kong SAR	48	52	26	74
Ireland	74	26	41	59
Korea, Rep.	48	52	42	58
New Zealand	63	37	26	74
Northern Ireland	78	22	40	60
Russian Fed.	97	3	92	8
Singapore	71	29	56	44
United States	84	16	57	43
TIMSS	75	25	59	41

A closer look at teachers' responses to the individual items making up the *Confidence in Teaching Mathematics* and *Confidence in Teaching Science* scales reveals further detail on specific aspects of mathematics and science teaching (Table 5.9). In most countries, pupils learn in classes where their teachers are less confident with some aspects of science teaching than mathematics teaching, such as answering pupils' questions and providing challenging tasks for more capable students. These appear to be regarded as more difficult for science lessons than for mathematics. In contrast, with regard to adapting their teaching to engage pupils' interests and helping pupils to appreciate the value of the subjects, the TIMSS averages are similar for each domain.

Table 5.9: Percentages of pupils' teachers who reported being *very confident* teaching specified aspects of mathematics and science, Ireland and TIMSS averages

		Answer pupils' questions about maths / science	Provide challenging tasks for capable pupils	Adapt teaching to engage pupil interests	Help pupils appreciate the value of learning maths / science	Show pupils a variety of problem-solving strategies	Explain science concepts or principles by doing science experiments
Maths	Ireland	92	63	63	61	70	
	TIMSS	84	59	65	69	75	
Science	Ireland	39	28	44	54		44
	TIMSS	62	43	63	68		51

In Ireland, the percentages of pupils whose teachers are *very confident* with the aspects of mathematics lessons shown in Table 5.9 are, broadly speaking, reasonably similar to the international averages. However, there is a very pronounced difference between the percentage of pupils in Irish classes where the teacher is *very confident* answering questions about science (39%) and about mathematics (92%). In general, fewer than half of Irish

pupils are in classes where their teacher is *very confident* with any of the specified aspects of science teaching, with the (marginal) exception of helping pupils to appreciate the value of science.

Continuing professional development

Teachers were asked a series of questions about their engagement in continuing professional development (CPD) in the two years prior to PT 2011. Questions for reading differed from those asked about mathematics and science, and therefore are presented separately below. Irrespective of domain, Irish teachers were far less likely to engage in regular CPD than were teachers in most countries.

Reading

For reading, teachers were asked to indicate the number of hours (if any) they had spent on reading-related CPD, and the frequency with which they read children's books for professional development. The 11% of Irish pupils who were taught by a teacher who had engaged in 16 hours or more of reading-related CPD (such as reading theory, or methods of teaching reading) was well below the PIRLS average of 24% (Table 5.10). Conversely, 37% of Irish pupils were taught by a teacher who had not engaged in *any* reading-related CPD over the previous two years, compared to 25% of pupils internationally.

Among our comparison countries, Finland is somewhat atypical, as 68% of Finnish pupils were in classes where their teacher reported spending no time on reading-related CPD in the previous two years. In all other comparison countries, attendance at reading-related CPD was more widespread than in Ireland. Although the percentages of pupils in classes where the teacher had engaged in 16 hours or more of reading CPD in England and Northern Ireland were similarly low to the percentage in Ireland, a greater percentage of Northern Irish and English pupils' teachers had spent at least some time on CPD (69% and 66%, respectively, compared to 52% in Ireland).

Table 5.10: Percentages of pupils' teachers who reported taking part in various amounts of CPD related to reading in the two years prior to PIRLS, Ireland and study averages

	16 hours or more	Some time, but less than 16 hours	No time
Australia	30	57	13
England	7	66	27
Finland	4	28	68
Hong Kong SAR	29	63	8
Ireland	11	52	37
New Zealand	27	60	13
Northern Ireland	12	69	19
Russian Fed.	39	43	18
Singapore	31	51	18
United States	41	55	4
PIRLS	24	50	25

Within Ireland, younger teachers were more likely to engage in CPD. Among teachers under 25 years of age, 42% of pupils' teachers reported participating in at least 16 hours of CPD over the previous two years. The corresponding percentages were lower for 25-29-year-olds (9%), 30-39-year-olds (5%), and 40-49-year-olds (10%), with no teachers over 50 reporting this level of reading-related CPD. More than half of pupils' teachers in the

40-49 and over 50 age groups had not taken part in *any* CPD related to reading over the two years before PT 2011, compared to 16% among teachers under 25.

Irish pupils were also less likely to be taught by a teacher who read children's books regularly for professional development purposes (Table 5.11). Across all PIRLS countries, 31% of pupils were taught by teachers who read children's books on an at least weekly basis – double the 15% of pupils in Ireland. Most Irish teachers read children's books at least occasionally. However, 14% of Irish pupils were in classes where their teacher *never or almost never* did so – almost three times as high as the PIRLS average of 5%. *Never or almost never* reading children's books was most common in Ireland among teachers under 25 (33% of Irish pupils, compared to 4% at the PIRLS average).

Table 5.11: Percentages of pupils' teachers reporting the frequency with which they read children's books for professional development, Ireland and PIRLS averages

	At least weekly	Once or twice a month	Once or twice a year	Never or almost never
Ireland	15	30	42	14
PIRLS	31	42	22	5

Mathematics and science

For CPD related to mathematics and science, teachers were not asked about the amount of time spent, but whether or not they had participated in CPD focusing on specific areas of instruction and assessment over the two years preceding the survey.

Two general themes emerged. First, compared to the TIMSS study average, pupils in Ireland are less likely to be taught by a teacher who had participated in *any* of the specified types of CPD in the previous two years. Second, Irish teachers' participation in science-related CPD was much lower than their participation in mathematics-related CPD. This seems a pertinent point, considering their lower confidence in most aspects of the teaching of science, relative to mathematics. As can be seen from Table 5.12, teachers in Ireland had lower than average participation rates generally, but particularly low rates of participation for CPD related to assessment.

Table 5.12: Percentages of pupils' teachers who participated in CPD related to specified aspects of mathematics and science teaching, Ireland and TIMSS averages

		Content	Pedagogy/ instruction	Curriculum	Integrating ICT into subject	Assessment	Addressing individuals' needs
Maths	Ireland	32	32	34	31	25	33
	TIMSS	44	46	41	33	37	43
Science	Ireland	23	16	24	17	9	12
	TIMSS	35	34	34	28	27	32

Collaborative practices

Teacher responses to five questions about the frequency with which they engaged in collaborative behaviours [4] with other teachers were used to create an overall measure called *Collaborate to Improve Teaching* (Table 5.13).

Only 16% of pupils in Ireland were taught by teachers classified as being *very collaborative*, less than half the PIRLS or TIMSS study averages. *Very collaborative* teachers are described as tending, on average, to take part in the specified activities at least 1-3 times per week for three of the activities, and 2-3 times per month for the other two. At the other end of the composite scale, 25% of Irish pupils were taught by teachers who are categorised as being *somewhat collaborative*, compared to just 11% of pupils internationally. Such teachers never or almost never take part in three of the specified activities, and take part in the other two activities no more than 2-3 times per month, on average.

Of all countries that participated in PIRLS and TIMSS, only four (Malta, Morocco, Yemen and Tunisia) had lower mean scores than Ireland on the *Collaborate to Improve Teaching* scale, indicating infrequent professional collaboration. Professional collaboration was more common in all of our comparison countries than in Ireland, and particularly high in Korea, England, and the US.

Of particular note is that roughly one-quarter of pupils in Ireland were taught by teachers who say that they *never or almost never* discuss teaching (25%) or collaborate in preparing materials (27%) with another teacher. Most Irish pupils (82%) were in classes with teachers who *never or almost never* visit another classroom to learn more about teaching, compared to 53% of pupils in all TIMSS countries and 58% in all PIRLS countries.

Table 5.13: Percentages of pupils' teachers in each *Collaborate to Improve Teaching* category, Ireland, comparison countries and study averages

	Very collaborative	Collaborative	Somewhat collaborative
Australia	44	44	12
England	48	44	8
Finland	27	58	15
Hong Kong SAR	23	66	11
Ireland	16	60	25
Korea, Rep.	51	46	4
New Zealand	41	53	6
Northern Ireland	21	55	24
Russian Fed.	31	67	1
Singapore	29	64	8
United States	48	42	10
PIRLS	35	54	11
TIMSS	36	53	11

[4] These were: "discuss how to teach a particular topic", "collaborate in planning and preparing instructional materials", "share what I have learned about my teaching experiences", "visit another classroom to learn more about teaching", and "work together to try out new ideas".

Teaching practices and classroom activities

This section is divided into six main parts. The first part reports the practices that teachers use in the classroom to engage pupils in learning, generally. The second, third and fourth parts relate specifically to the teaching of reading, mathematics, and science, respectively. In the fifth part, teachers' approaches to setting and using homework assignments are described. Finally, the use of ICT in the classroom is examined. One feature worth noting in relation to the classroom practices described below is the relatively high percentage of Fourth class pupils in Ireland (33%) who are taught as part of a multigrade classroom. Only five countries in PT 2011 (Portugal, Canada, France, Australia and New Zealand) had a higher percentage of Fourth grade pupils in multigrade classes. Pupils' reports of their attitudes to learning reading, mathematics, and science, and general engagement at school, are reported in Chapter 3 (Clerkin & Creaven, 2013).

Engaging pupils in lessons

Teachers who took part in PT 2011 were asked about the various teaching practices that they use in the classroom, both generally and with specific reference to the teaching of reading, mathematics and science. Table 5.14 shows the percentages of pupils whose teachers employ a range of practices aimed at engaging pupils in lessons, generally.

Table 5.14: Percentages of pupils' teachers indicating the frequency with which they employed various strategies to engage pupils in lessons in general, Ireland and study averages

		Every or almost every lesson	About half of lessons	Some lessons	Never
Summarise what pupils should have learned from the lesson	IRL	52	29	18	1
	PIRLS	68	20	11	<1
	TIMSS	69	19	12	<1
Relate the lesson to pupils' daily lives	IRL	53	29	18	0
	PIRLS	57	28	14	<1
	TIMSS	57	28	15	<1
Use questioning to elicit reasons and explanations	IRL	91	8	<1	<1
	PIRLS	81	15	4	<1
	TIMSS	78	16	6	<1
Encourage all pupils to improve their performance	IRL	90	7	2	0
	PIRLS	85	12	3	<1
	TIMSS	83	13	4	<1
Praise pupils for good effort	IRL	94	6	<1	0
	PIRLS	87	10	2	<1
	TIMSS	86	10	3	<1
Bring interesting materials to class	IRL	26	39	35	<1
	PIRLS	29	42	29	<1
	TIMSS	30	39	31	1

Teacher reports indicate that Irish pupils were somewhat less likely than pupils internationally to have a teacher bring interesting materials to class, or to summarise what pupils were expected to have learned from the lesson, but slightly more likely to be praised when they were considered to have made a good effort. The frequency with which teachers reported engaging in each of these practices was used to create an overall composite measure

of the efforts that teachers make to engage their pupils in instruction, labelled *Instruction to Engage Students in Learning*. On this measure, 67% of Irish pupils were taught by a teacher who made efforts to engage them in *most lessons*, and 32% in *about half the lessons*. The corresponding averages for PIRLS countries are 71% and 27%, and among TIMSS countries 69% and 30%. Irish pupils are therefore slightly less likely than average to have a teacher who took steps to engage them in *most lessons*. About 1% of Irish pupils, and 2% internationally, had a teacher who took steps to engage them only in *some lessons*.

Although not shown in Table 5.14, Irish *pupils* reported that their teachers tell them that they are good at mathematics slightly more often than average (78% in Ireland *agreed a lot* or *a little*, compared to 75% internationally), and tell them that they are good at science slightly less often (67%, compared to 73% internationally).

Reading lessons

Irish teachers reported that the practices most likely to be employed in reading lessons *every day or almost every day* were asking pupils to read aloud and to answer oral questions about what they had read (Table 5.15). Asking pupils to read aloud was more common in Ireland than the average across PIRLS countries. Irish pupils were also more likely to be given time to read a book of their own choosing *every day or almost every day* (55%, compared to the international average of 32%). In contrast, teaching pupils new vocabulary, teaching skimming or scanning strategies for reading, and giving pupils a written test about what they had read occurred relatively less frequently in Ireland.

Table 5.15: Percentages of pupils' teachers indicating the frequency with which they employed various practices in **reading** lessons, Ireland and PIRLS averages

		Every day or almost every day	1 or 2 times a week	1 or 2 times a month	Never or almost never
Teacher reads aloud to the class	IRL	64	30	5	<1
	PIRLS	62	29	8	1
Ask pupils to read aloud	IRL	82	17	1	0
	PIRLS	70	25	4	1
Ask pupils to read silently on their own	IRL	63	35	1	<1
	PIRLS	65	30	4	1
Give pupils time to read books of their own choosing	IRL	55	39	7	<1
	PIRLS	32	34	28	6
Teach pupils strategies for decoding sounds and words	IRL	30	54	13	3
	PIRLS	32	34	21	13
Teach pupils new vocabulary systematically	IRL	36	45	14	5
	PIRLS	51	35	11	3
Teach or model skimming or scanning strategies	IRL	13	37	39	11
	PIRLS	22	34	29	15
Write something in response to what they have read	IRL	27	62	11	0
	PIRLS	24	45	27	5
Answer oral questions about or orally summarise what they have read	IRL	76	22	2	0
	PIRLS	58	34	7	1
Talk with each other about what they have read	IRL	24	49	22	4
	PIRLS	33	42	19	6
Take a written quiz or test about what they have read	IRL	8	20	49	24
	PIRLS	11	32	43	14

Mathematics lessons

In mathematics lessons (Table 5.16), fewer pupils in Ireland than at the TIMSS average were asked to memorise rules, procedures and facts *every day or almost every day* (30% compared to 37%), but Irish pupils were more likely to engage in memorisation of mathematics at least once a week (72% in Ireland and 61% internationally). Irish Fourth class pupils were also more likely than their peers internationally to work out problems with their class under their teacher's guidance, and to work out problems by themselves or with classmates while their teacher was doing something else. However, Irish pupils were somewhat less likely to relate what they learned in a mathematics lesson to their everyday lives, or to take a written mathematics test.

Table 5.16: Percentages of pupils' teachers indicating the frequency with which they employed various practices in **mathematics** lessons, Ireland and TIMSS averages

		Every day or almost every day	1 or 2 times a week	1 or 2 times a month	Never or almost never
Listen to me explain how to solve problems	IRL	67	23	10	1
	TIMSS	70	18	12	<1
Memorise rules, procedures and facts	IRL	30	42	26	2
	TIMSS	37	24	36	3
Work problems (individually or with peers) with my guidance	IRL	53	32	15	0
	TIMSS	55	28	16	<1
Work problems together with the whole class with direct guidance from me	IRL	53	32	15	1
	TIMSS	45	27	27	1
Work problems (individually or with peers) while I am occupied by other tasks	IRL	24	27	34	15
	TIMSS	16	16	39	29
Explain their answers	IRL	59	28	13	1
	TIMSS	62	24	14	<1
Relate what they are learning in mathematics to their daily lives	IRL	31	34	35	0
	TIMSS	44	31	24	0
Take a written test or quiz	IRL	5	19	75	<1
	TIMSS	18	21	60	1

Science lessons

With regard to the teaching of science, teacher reports indicated that relatively more pupils in Ireland than the TIMSS average watched a teacher demonstrate an experiment in class at least once a week (57%, compared to 39% of Fourth grade pupils internationally) (Table 5.17). Also, Irish pupils were more likely to regularly (weekly) conduct experiments or investigations, but significantly less likely to be asked to engage in memorisation of facts. Only 5% of Fourth class pupils memorised scientific facts and principles *every day or almost every day*, only one-sixth of the international average (30%). Similarly, about 19% of Irish pupils *never or almost never* memorise scientific facts in class (11% internationally).

Comparing Tables 5.15 and 5.16 to Table 5.17, it is clear that science-related activities in the classroom are less frequent than reading- and mathematics-related activities, both in Ireland and internationally.

Table 5.17: Percentages of pupils' teachers indicating the frequency with which they employed various practices in **science** lessons, Ireland and TIMSS averages

		Every day or almost every day	1 or 2 times a week	1 or 2 times a month	Never or almost never
Observe natural phenomena such as the weather or a plant growing and describe what they see	IRL	14	28	58	1
	TIMSS	19	25	54	2
Watch me demonstrate an experiment or investigation	IRL	11	46	42	2
	TIMSS	17	22	57	4
Design or plan experiments or investigations	IRL	11	34	44	11
	TIMSS	11	22	57	9
Conduct experiments or investigations	IRL	16	39	43	3
	TIMSS	14	24	57	4
Read their textbooks or other resource materials	IRL	32	32	35	1
	TIMSS	45	25	27	3
Have pupils memorise facts and principles	IRL	5	13	63	19
	TIMSS	30	22	37	11
Give explanations about something they are studying	IRL	49	31	20	1
	TIMSS	57	24	18	1
Relate what they are learning in science to their daily lives	IRL	50	32	18	0
	TIMSS	61	24	15	<1
Do field work outside the class	IRL	1	11	79	9
	TIMSS	5	14	70	11
Take a written test or quiz	IRL	2	10	68	20
	TIMSS	16	18	60	6

Homework

Teachers' reports show that Fourth class pupils in Ireland tended to receive reading and mathematics homework more frequently than Fourth grade pupils in other countries (Tables 5.18 and 5.19). For example, 60% of Irish pupils were assigned reading homework *every day*, almost double the international average of 34%. Only in four countries (Azerbaijan, Bulgaria, Norway and the United States) did teachers report more pupils receiving reading homework *every day* than in Ireland (all 63-69%). Similarly, for mathematics, 62% of Irish pupils receive homework *every day* in comparison to 36% of pupils across all TIMSS countries.

Only 3% of Irish Fourth class pupils were either *not assigned* reading homework or received homework *less than once a week* (PIRLS average: 16%). Atypical countries on this measure are the Netherlands, where 75% of Fourth grade pupils receive homework *less than once a week*, or not at all, and Belgium (French-speaking) where 48% of pupils received homework no more than once a week.

Table 5.18: Percentages of pupils' teachers indicating the frequency with which they assigned **reading** homework, Ireland, comparison countries and study averages

	No homework	Less than once a week	1 or 2 times a week	3 or 4 times a week	Every day
Australia	1	3	15	22	59
England	13	14	29	15	29
Finland	1	3	22	42	32
Hong Kong SAR	4	27	34	15	20
Ireland	0	3	10	28	60
New Zealand	6	9	16	20	49
Northern Ireland	0	0	20	28	52
Russian Fed.	0	3	22	22	53
Singapore	12	37	38	9	4
US	3	4	11	19	63
PIRLS	4	12	30	21	34

Table 5.19: Percentages of pupils' teachers indicating the frequency with which they assigned **mathematics** homework, Ireland, comparison countries and study averages

	No homework	Less than once a week	1 or 2 times a week	3 or 4 times a week	Every day
Australia	7	9	47	18	20
England	3	19	76	1	2
Finland	0	0	3	78	19
Hong Kong SAR	0	0	0	4	96
Ireland	0	0	5	33	62
Korea, Rep.	7	22	46	23	1
New Zealand	20	15	40	13	13
Northern Ireland	0	0	53	30	17
Russian Fed.	0	1	1	47	52
Singapore	0	1	16	49	33
US	3	1	18	43	35
TIMSS	3	5	24	32	36

Science homework is assigned much less frequently than reading or mathematics homework (Table 5.20). Further, in contrast to the findings for reading and mathematics, pupils in Ireland receive science homework much less frequently than pupils in other countries. About 86% of Fourth class pupils in Ireland were either *not assigned* science homework or were assigned homework *less than once a week* (Table 5.20). The equivalent figure across all TIMSS countries is 48% of Fourth grade pupils. No Irish pupils received science homework *three or four times a week* or *every day*, compared to 13% of Fourth grade pupils internationally.

Among our comparison countries, substantial differences in practice are apparent. Reading homework is given less frequently (in terms of being never or very rarely assigned) in England, Hong Kong, and Singapore, and mathematics homework is less common in England, Korea, and New Zealand.

Table 5.20: Percentages of pupils' teachers indicating the frequency with which they assigned **science** homework, Ireland, comparison countries and study averages

	No homework	Less than once a week	1 or 2 times a week	3 or 4 times a week	Every day
Australia	60	36	4	0	0
England	39	53	8	<1	0
Finland	1	4	62	30	3
Hong Kong SAR	5	22	49	21	3
Ireland	40	46	14	0	0
Korea, Rep.	27	62	12	0	0
New Zealand	74	25	1	0	0
Northern Ireland	62	37	1	0	0
Russian Fed.	1	2	88	1	9
Singapore	1	29	63	5	2
US	33	41	22	4	1
TIMSS	18	30	39	8	5

The average length of time that Irish pupils were expected to spend on reading and mathematics homework by their teachers is generally less than the international average (Table 5.21). Teachers of 61% of Irish pupils indicated that reading assignments were expected to take no more than 15 minutes, compared to 22% of pupils at the PIRLS average. At the other extreme, teachers of about 5% of Irish pupils were expected to spend more than half an hour on each reading homework assignment, compared to 23% internationally. The Russian Federation was particularly notable for the long expected duration of reading homework there, with 13% of pupils expected to spend more than an hour on reading assignments.

A similar pattern is evident for mathematics. Table 5.21 shows that 61% of Irish pupils, but only 26% of pupils across all TIMSS countries, were expected to spend 15 minutes or less on their mathematics homework each time it is assigned. In contrast, teachers of 1% of Irish pupils, and 17% of pupils internationally, were expected to spend more than half an hour on each mathematics assignment. Teachers in Singapore, Hong Kong and – to a lesser degree – the Russian Federation and Northern Ireland assigned lengthy mathematics homework more frequently than teachers in Ireland or our other comparison countries, with between one-quarter and one-half of pupils expected to spend at least half an hour on mathematics assignments.

On the rare occasions (Table 5.20) when science homework was assigned in Ireland, teachers of 42% of pupils expected it to take less than 15 minutes, and teachers of only 1% of pupils expected it to take more than half an hour, compared to 11%, internationally (Table 5.21).

In general, therefore, Fourth class pupils in Ireland appear to receive shorter, but more frequent, reading and mathematics homework assignments than Fourth grade pupils in many other countries. In contrast, science homework was both less regularly assigned and of shorter length in Ireland than in most countries.

Table 5.21: Percentages of pupils' teachers indicating the amount of time they expected pupils to spend on homework, by domain, Ireland and study averages

		15 minutes or less	16-30 minutes	31-60 minutes	More than 60 minutes
Reading	Ireland	61	35	5	<1
	PIRLS	22	55	19	4
Maths	Ireland	61	38	1	0
	TIMSS	26	57	16	1
Science	Ireland	42	17	1	<1
	TIMSS	32	39	10	1

Rows do not sum to 100 as the item is not applicable for those teachers who do not assign homework in each domain.

Table 5.22 shows the percentages of Fourth grade pupils whose teachers engaged in specified interactions with pupils regarding their homework assignments. In Ireland, for reading and mathematics, large majorities of pupils were taught by teachers who corrected homework assignments and gave feedback to their pupils, discussed the homework in class, and monitored the completion of homework *always or almost always*. These practices are more frequent in Ireland than at the PIRLS or TIMSS averages. A very small percentage of Fourth class pupils (0-2% for reading, less than 1% for mathematics, and 1% for science) are in classes where teachers report that they *never or almost never* engaged in these three activities.

In this regard, Irish teachers appear to be more attentive to pupils' homework than their peers in many other countries, including the majority of our comparison countries.

Table 5.22: Percentages of pupils' teachers indicating frequency of providing different types of feedback on homework, by domain, Ireland and study averages

		Correct assignments and give feedback to pupils			Discuss the homework in class			Monitor whether homework was completed		
		Always/ almost always	Some-times	Never/ almost never	Always/ almost always	Some-times	Never/ almost never	Always/ almost always	Some-times	Never/ almost never
Reading	Ireland	82	17	1	76	22	2	97	3	0
	PIRLS	74	23	4	68	29	3	91	8	2
Maths	Ireland	93	7	<1	86	14	<1	100	<1	0
	TIMSS	77	19	2	63	33	2	89	8	1
Science	Ireland	51	8	1	46	13	1	54	5	1
	TIMSS	60	19	2	59	21	1	73	8	1

Rows do not sum to 100 as the item is not applicable for those teachers who do not assign homework in each domain.

Use of ICT in the classroom

Teachers reported that a small majority of Fourth class pupils in Ireland were taught in classes where a computer is available for pupils to use during reading (56%), mathematics (55%) and science (62%) lessons. The corresponding international averages are, respectively, 45% (for PIRLS countries), and 42% and 47% (for TIMSS countries), showing that there is slightly greater than average availability of computers in Ireland. A little over half (53%) of pupils with computer access in Ireland also had access to the internet, compared to two-fifths (39%) among PIRLS countries.

Almost all (98%) Fourth class pupils in Ireland were taught by a teacher who reported using a computer for classroom instruction, well above the PIRLS and TIMSS international averages (74% for both studies). The use of computers in class was also almost universal in England, Singapore, Hong Kong and Northern Ireland, but was slightly less common in Finland (89%).

Table 5.23 displays the percentages of pupils (as reported by their teachers) who used computers for a range of activities in their reading, mathematics, and science lessons. Approximately one-quarter to one-half of Irish Fourth class pupils used computers at least once a month to look up ideas or information in the three domains. About two-fifths of Irish pupils used computers to read or write stories or texts during reading lessons, and to explore concepts and practice skills during mathematics lessons.

Computer were used less frequently in reading lessons to develop reading skills and strategies, and to practise scientific skills, procedures, and experiments in science lessons. About one-third of Irish pupils *rarely or never* used computers to practise scientific skills (31%) or to do scientific experiments or procedures (33%).

Table 5.23: Percentages of pupils' teachers indicating frequency with which computers were used in lessons for different types of activities, by domain, Ireland and study averages

			Every day or almost every day	1 or 2 times a week	1 or 2 times a month	Rarely or never
Reading	To look up information	IRL	3	22	25	5
		PIRLS	4	17	17	6
	To read stories or other texts	IRL	3	19	20	13
		PIRLS	3	12	18	12
	To write stories or other texts	IRL	1	10	32	12
		PIRLS	3	10	19	12
	To develop reading skills and strategies with instructional software	IRL	1	10	18	25
		PIRLS	3	11	15	15
Maths	To explore mathematics principles and concepts	IRL	2	16	24	13
		TIMSS	2	9	15	15
	To look up ideas and information	IRL	1	7	26	21
		TIMSS	3	8	16	15
	To practise skills and procedures	IRL	3	22	18	12
		TIMSS	4	14	16	7
Science	To do scientific procedures / experiments	IRL	<1	5	23	33
		TIMSS	1	6	16	23
	To look up ideas and information	IRL	2	15	38	6
		TIMSS	3	13	24	6
	To practise skills and procedures	IRL	1	5	24	31
		TIMSS	2	9	20	16
	To study natural phenomena through simulations	IRL	1	6	28	26
		TIMSS	2	6	18	22

Pupils' use of computers in the classroom may be considered in light of teachers' preparation for teaching with computers, and the support that they receive in doing so. Table 5.24 shows several factors that may influence teachers' use of computers in the classroom for Ireland and some of our comparison countries.

In Ireland, the majority of pupils (93%) were taught by a teacher who *agreed a little* or *a lot* that they felt comfortable using a computer in their teaching. This is similar to the international averages and to the percentages reported in Finland and the Russian Federation, but lower than in most other comparison countries.

The percentage of pupils in Ireland whose teachers considered themselves to have received adequate support for integrating the use of computers into their teaching (72%) is somewhat lower, and slightly below the international averages. By comparison, at least 90% of pupils in England, Northern Ireland, Hong Kong and Singapore are taught by teachers who received adequate support for integrating computers into their teaching.

"Teaching support" was more commonly available than access to adequate technical support in Ireland, England and Northern Ireland. In Ireland, about two-thirds (64%) of Fourth class pupils were taught by a teacher who said that they could access technical support when required. Although similar to Finland, this represents a lower percentage of pupils than in any of our other comparison countries, or the PIRLS and TIMSS international averages. The four comparison countries where access to support staff exceeded 90% – Hong Kong, Korea, Russian Federation and Singapore – all had average school enrolments well above the study averages (see Lewis & Archer, 2013), suggesting that ease of access to support staff may be, to some extent, a function of school size.

Table 5.24: Percentages of pupils' teachers indicating the extent of their agreement that they were comfortable or supported in using computers for teaching purposes, Ireland and study averages

	Feel comfortable using computers in teaching		Have access to computer support staff when there are technical problems		Receive adequate support for integrating computers into teaching	
	Agree*	Disagree*	Agree	Disagree	Agree	Disagree
Australia	97	3	78	22	81	19
England	99	1	75	25	90	10
Finland	92	8	62	38	60	40
Hong Kong	98	2	97	3	94	6
Ireland	93	7	64	36	72	28
Korea, Rep.	97	3	81	19	89	11
New Zealand	98	2	79	21	79	21
N. Ireland	97	3	82	18	91	9
Russian Fed.	91	9	90	10	89	11
Singapore	100	<1	95	5	95	5
United States	97	3	76	24	76	24
PIRLS	93	7	74	26	75	25
TIMSS	92	8	76	24	78	22

* *A lot* or *a little*.

Within Ireland, pupils in DEIS Urban schools were somewhat more likely to be taught by a teacher who was comfortable using computers while teaching – particularly in Band 2 schools, where no teachers *disagreed* that they felt confident. Teachers' lack of confidence in using computers to teach was more pronounced in DEIS Rural schools where under one-third of pupils (28%) were taught by teachers who *disagreed a little* that they were

confident (although no pupils were taught by teachers who *disagreed a lot*). Whether this is a function of different support and resource availability or of the older profile of teachers in DEIS Rural schools (and rural schools in general) is unclear.

As well as confidence teaching with ICT, appropriate access to support staff was also highest in Urban Band 2 schools (79% *agreed a little* or *a lot*). Although almost half of pupils (46%) in Band 1 schools were taught by teachers who *agreed a lot* that they had access to support staff when required (a greater percentage than in non-DEIS schools), a similar percentage were taught by teachers who *disagreed a little* or *a lot*. The availability of technical support for pupils in DEIS Rural schools (67% *agreed a little* or *a lot*) was broadly similar to that in non-DEIS schools (63%).

Finally, pupils in Urban Band 1 schools were markedly more likely to have had a teacher who reported having received adequate support in integrating technology in their teaching, with only 6% taught by teachers who *disagreed* that this was the case. This compares to 40% in Urban Band 2 schools, 14% in Rural schools, and 29% in non-DEIS schools. Differences may be related to the younger profile of teachers in Urban Band 1 schools, who are more likely to be recent graduates, and to have explored integrating ICT into teaching as part of their initial teacher education.

Discussion

This final section summarises and highlights some of the main findings from PT 2011 about the teachers, and teaching, of Fourth class pupils. Ireland is notable for the high percentage of pupils being taught by young teachers in the early stages of their careers. For example, almost four times as many pupils in Ireland as at the PIRLS or TIMSS international averages are taught by a teacher aged 25 or under. A more detailed examination of the reasons for this finding – drawing on data relating to teacher recruitment and retirement, pupil enrolment, and policy relating to pupil-teacher ratios, for example – may be worthwhile.

Irish teachers generally expressed high levels of satisfaction with their profession, compared to teachers in most other countries. However, teacher satisfaction is noticeably lower in DEIS Urban Band 2 schools than in other school types, reflecting Day's (2008) assertion that teachers' commitment to the profession is "more persistently challenged" in schools serving more disadvantaged communities. The relatively low percentage of pupils taught by older or more experienced teachers in Urban Band 2 schools is worth noting in this regard. The higher teacher satisfaction found in Band 1 schools may suggest that the additional supports they receive may help to mitigate some of the challenges faced by teachers in DEIS schools. Day (2008) suggests that supporting resilience and commitment among staff – particularly in schools with more disadvantaged pupil intakes or with greater disciplinary problems – should be considered an issue for professional development, a point also made by Banks and Smyth (2011).

Teacher' questionnaire responses also show that Ireland is unusual, in international terms, for the very low level of collaboration and sharing of professional expertise among teachers of Fourth class pupils. For example, about one-quarter of Irish pupils are taught by teachers who never or almost never discussed teaching with their colleagues, or worked with their teaching colleagues in preparing instructional materials. Only in four countries (Malta, Morocco, Tunisia and Yemen) were collaborative practices less frequent. At post-primary level, too, collaborative practices such as observing other teachers' classes have been shown to be quite rare in Irish schools (Shiel, Perkins, & Proctor, 2009). The Teaching Council's code of professional conduct, last revised in 2012, encourages collegiality and collaboration, regarding it as a key component of the profession. For example, they recommend that teachers should "work with teaching colleagues and student teachers in the interests of

sharing, developing and supporting good practice and maintaining the highest quality of educational experiences for pupils/students" and "in a context of mutual respect, be open and responsive to constructive feedback regarding their practice and, if necessary, seek appropriate support, advice and guidance" while exercising their duties (Teaching Council, 2012, pp. 7-8). The Department of Education and Skills' recently-updated guidelines for school self-evaluation also actively promote collaboration among teachers in planning lessons and observing each other's work (DES, 2012a).

Irish teachers reported being much less confident teaching science than mathematics. While this was also the case in many other countries, it was particularly apparent in Ireland. In comparative terms, similar percentages of pupils in Ireland and internationally were taught by teachers who were *very confident* teaching mathematics, while the percentage of pupils in Ireland whose teachers were *very confident* teaching science was about two-thirds of the corresponding TIMSS average. Specific areas where confidence was particularly low in science teaching included answering pupils' questions about the subject, and providing suitably challenging tasks for high-performing pupils. Irish teachers' lack of confidence in these areas may be considered in light of their relatively low participation in subject-specific CPD. Compared to pupils internationally, pupils in Ireland are less likely to be taught by a teacher who had participated in any CPD relating to a range of specific instructional and assessment-related topics in the two years prior to PT 2011. This is the case for both science- and mathematics-related CPD.

Similarly, compared to teachers in most countries, Irish teachers spent less time on reading-related CPD, and were far less likely to report reading children's books for the purpose of professional development. In fact, just under two-fifths of Irish pupils were taught by teachers who reported engaging in *no* reading-related CPD over the previous two years. Low rates of participation in CPD in Ireland, relative to many other countries, have also been noted at post-primary level (Gilleece et al., 2009).

Unlike some other European countries (European Commission/EACEA/Eurydice, 2013), participation in CPD is optional for Irish teachers rather than being a contractual requirement or a necessity for promotion. The Irish approach can be contrasted to that in many other countries. Teachers' engagement in significant CPD is by no means universal, but it is a prominent feature of most of the higher-performing education systems. For example, primary school teachers in Singapore are entitled to a minimum of 100 hours of CPD annually (Chin et al., 2012). In Korea, teachers with more than three years of service must complete a 180-hour CPD programme in order to advance from being a "Grade II" teacher (newly-qualified) to a "Grade I" teacher (Cho, Kim, Kim, & Rim, 2012). In Finland, participation in CPD is a requirement, and teachers – all qualified to Master's level – must participate in a *minimum* of three days CPD per annum (Kupari & Vettenranta, 2012). However, many Irish principals report that "nearly all" of the teachers in their school would be eager to participate in CPD (Banks & Smyth, 2011).

Thus, while the mean scores achieved by Irish pupils for each of the three assessed domains were significantly above the international centrepoints (Eivers & Clerkin, 2012a), targeted CPD might help to support teachers' confidence and competence in the classroom, and thereby further support pupil learning. The findings reported here suggest that teachers' confidence when discussing and teaching science in the classroom is especially low compared to confidence with mathematics, and could benefit from further professional development. The suggestion by Eivers et al. (2010) that schools should identify their key CPD requirements at both the school- and the individual teacher-level, in order to ensure that teachers participate in CPD in areas where it is most needed, is worth reiterating.

The 2009 National Assessments showed that the use of ICT in the classroom was identified by teachers as the highest-priority topic for CPD in relation to mathematics teaching, and one of the highest in relation to reading, at both Second and Sixth class levels. Teachers also reported a lack of confidence in using computers to teach reading or mathematics (Eivers et al., 2010). In contrast, most teachers in PT 2011 reported feeling comfortable using a computer in the classroom, and a large majority say that they receive adequate support in integrating ICT into their teaching. Almost all Fourth class pupils in Ireland were in classes where their teacher uses a computer for instruction – more than the international study averages. However, although computers are widely available in Irish classrooms, pupils' use of the technology is often at a relatively basic level, such as looking up information or reading a story on-screen. In addition, a minority of pupils *rarely or never* use a computer in class at all. The integration of ICT into teaching therefore appears to remain an area where professional development is key.

Finally, the data from PT 2011 show clearly that teachers, both in Ireland and internationally, spend substantially less time on science-related teaching activities than on reading or mathematics. For example, few Irish pupils are expected to memorise scientific facts or principles more frequently than once or twice a month, although this practice is much more common in mathematics lessons, possibly suggesting that pupils' basic scientific knowledge is being under-developed. Irish pupils also receive much less science homework – and less frequently – than reading or mathematics homework. Of relevance here is the amount of time allocated to teaching each of the three domains, with relatively little time allocated to science instruction in Ireland. This is described further in Chapter 2 of this volume (Lewis & Archer, 2013).

Additional references

This section does not repeat the core references already listed in Chapter 1. These include the three international reports and the Irish national report on PT 2011, and those related to other key studies such as National Assessments and PISA.

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