

Teachers' Professional Development - Europe in international comparison

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An analysis of teachers' professional development based on the OECD's Teaching and Learning International Survey (TALIS)



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An analysis of teachers' professional development based on the OECD's Teaching and Learning International Survey (TALIS)

A secondary analysis based on the **TALIS** dataset
Editor: Professor Jaap Scheerens, University of Twente

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FOREWORD: GUIDE TO THE READER

This report presents a secondary analysis and an enlarged interpretation of the results on teachers' professional development from the OECD's Teaching and Learning International Survey (TALIS). TALIS is the first international survey to focus on the working conditions of teachers and the learning environment in schools. Its aim is to help countries to review and develop policies that foster the conditions for effective schooling. TALIS is conceptualised as a programme of surveys, with successive rounds to address policy-relevant issues chosen by countries. With a focus on lower secondary education in both public and private sectors, the first round of TALIS examined important aspects of teachers' professional development, together with aspects of teachers' beliefs, attitudes and practices; teacher appraisal and feedback; and school leadership in 23 participating countries. The first results from TALIS were published in *Creating Effective Teaching and Learning Environments: First results from TALIS* (OECD, 2009).

The first chapter of this report summarises EU priorities with respect to enhancing the quality of education in order to put "a continuum of teacher education" within a perspective of subsidiarity as well as co-ordination. It emphasises school autonomy in providing opportunities for continuous professional development and underlines the value of the TALIS study for supporting relevant policies at school, national and international levels.

The second chapter refers to the may contribute to more effective education and training arrangements. A broad distinction is made between initial training, in-service training and continuous professional development. Among others it is noted that further empirical research is needed to learn whether the expected results of continuous professional development and the organisation of professional learning communities are effectively being achieved.

The third chapter summarises factual information on professional development in earlier relevant studies from the EU and the OECD.

The fourth chapter investigates participation rates, intensity of participation, differentiation across types of participation, areas of unmet demand, barriers to and conditions supportive of professional development, on the basis of the TALIS data. This chapter follows the same structure as Chapter 3 of the first report from the TALIS study (OECD, 2009) and reproduces the main findings and conclusions of that chapter. It also analyses these teacher and school background conditions in greater depth. Specific attention is given to the profiles of the 11% of teachers who reported to not being involved in any kind of professional development activity.

The fifth chapter explores a more complex model, in which it is hypothesised that the experienced impact of professional development is influenced by a set of interrelated school and teacher variables. One of the most striking findings is the relative importance of feedback. The more teachers have found that feedback has led to changes in aspects of their work, the greater their development needs, the more they participate in different professional development activities, and the greater the experienced impact of professional development. This finding underlines the crucial importance for fostering teacher learning of appraisal and feedback at the school level.

The sixth chapter summarises data on teachers' professional development from countries that did not take part in the first TALIS study. It shows that the TALIS study provides a broad set of data which existing data sources in non-participating countries generally cover only partially. At the same time the chapter points to many interesting policy initiatives in the field of teachers' professional development in these countries.

The seventh chapter summarises the main outcomes of the study, draws some overall conclusions and raises some issues for further reflection.

European political context

1.1 Introduction

Though the organisation and content of education and training systems are entirely their responsibility, Member States of the European Union increasingly acknowledge the benefits of policy co-operation with their European Union partners to address common challenges in these fields.

For example, in the Education and Training Work Programme, Member States set themselves common objectives to improve education and training systems. One is to improve the quality of teacher education. The programme is implemented through an open method of co-ordination, which promotes peer learning and makes use of indicators and benchmarks to support evidence-based policy making and to monitor progress.

As examples of the fruits of this work, the Council and Parliament have adopted various recommendations: "Improving Quality Evaluation in School Education" (2001/166/EC; OJ L 60 of 1.3.2001); and "Promoting Key Competences for Lifelong Learning" (2006/962/EC; OJ L 394/10 of 30.12.2006). The Education Council has adopted conclusions: "Improving the Efficiency and Equity of Education and Training Systems" (OJ 2006/C 298/03 of 8.12.2006); "Improving the Quality of Teacher Education" (2007/C 300/07 of 15.11.07); and "Preparing Young People for the 21st Century: An Agenda for European Co-operation on Schools" (2008/C 319/08 of 21.11.08).

These developments highlight the fact that education systems in general, and schools in particular, are recognised as playing an important role in achieving the European Union's Lisbon goals for economic growth, social cohesion and environmental sustainability; the European Council has stressed the key role of education and training for the future growth, long-term competitiveness and social cohesion of the Union as a whole. For individuals too, education is crucial: children's attainment in compulsory education has a strong direct impact on their later social participation, further education or training, and wages (OECD, 2007, p. 105; OECD, 2001, pp. 10-13).

With this in mind, education ministers have pledged to improve the quality and equity of education systems and have subscribed to common objectives for European Union education and training systems. In particular, the Education Council adopted three benchmarks for 2010 that relate directly to school education (on early school leavers, reading literacy and completion of upper secondary education). But progress is insufficient. Accordingly, the Education Council has urged Member States to reduce substantially the number of young people who cannot read properly and the number of early school leavers, and to improve the achievement of learners from a migrant or other disadvantaged background.

It is against this background of closer co-operation on school education policies among Member

States that the Council, in May 2005 and May 2007, asked the Commission to co-operate with the OECD on the development of the Teaching and Learning International Survey (TALIS),¹ in order better to satisfy EU needs for data on the professional development of teachers. This demand should be seen in the context of the quest for evidence-based policy making to support the identification of good performance for peer review and exchange, and for the analysis of progress towards agreed common objectives.

Following this request, the Commission established a group of Member State experts to define the Union's data needs in this area. These were subsequently included in the TALIS instruments. Of the 24 countries taking part in the survey 19 are EU Member States, pre-accession, acceding or EEA countries.

1.2 The changing world of teaching

The environments in which teachers work, and the demands placed upon them by society are increasingly complex. As ministers have noted (2007/C 300/07 of 15.11.07), teachers strive to equip learners with a wide range of skills that they will require to take their place in a world that is in constant evolution; this hastens the need for the development of more competence-centred approaches to teaching, together with greater emphasis on learning outcomes. Pupils are increasingly expected to become more autonomous learners and to take responsibility for their own learning. The learners in any class may come from an increasingly wide range of backgrounds and may have a very broad range of abilities.

In this context, even initial teacher education of the highest quality cannot provide teachers with the knowledge and skills necessary for a lifetime of teaching. Teachers are called upon not only to acquire new knowledge and skills but also to

develop them continuously. The education and professional development of every teacher needs to be seen as a lifelong task, and be structured and resourced accordingly. To equip the teaching body with the skills and competences needed for its new roles, it is necessary to have both quality initial teacher education and a coherent process of continuous professional development to keep teachers up to date with the skills required in a knowledge-based society.

As schools become more autonomous, with open learning environments, teachers assume greater responsibility for the content, organisation and monitoring of the learning process, as well as for their own personal career-long professional development (2007/C 300/07 of 15.11.07). Furthermore, as with any other modern profession, teachers have a responsibility to extend the boundaries of professional knowledge through a commitment to reflective practice, through research, and through systematic engagement in continuous professional development from the beginning to the end of their careers. Systems of education and training for teachers need to provide them with the necessary opportunities.

This in turn presents teacher education institutions, teacher educators and schools with fresh challenges when developing or implementing programmes for both student teachers and practising teachers.

1.3 Teaching and schools policy

Following a public consultation [SEC(2007)1009], the Commission in 2008 proposed an agenda for strengthening European co-operation on schools policy: "Improving Competences for the 21st Century: An Agenda for European Co-operation on Schools" [COM(2008) 425 final] focused on three essential areas: promoting key competences, ensuring high quality learning for every student and supporting teachers and school staff.

One year earlier, the European Commission had identified the quality of teaching and teacher education as key factors in securing the quality of education systems and improving the educational

¹ The need for indicators on teachers' professional development was part of a wider framework of 16 core indicators for monitoring progress towards the Lisbon objectives identified by the Council.

attainment of young people [COM(2007) 392 final of 3.8.2007]. The Commission highlighted research which suggests that teacher quality is significantly and positively correlated with pupil attainment (e.g. Darling Hammond et al., 2005; Greenwald, Hedges and Laine, 1996; Rockoff, 2004); that it is the most important within-school explanation of student performance (its effects are much larger than the effects of school organisation, leadership or financial conditions) (Rivkin, Hanushek and Kain, 2005); and that there are positive relations between in-service teacher training and student achievement (Angrist and Lavy, 2001; Bressoux, 1996).

More recently, a study of the common characteristics of the most successful school systems highlights the central role of teachers, asserting that “the quality of an education system cannot exceed the quality of its teachers” and that “the only way to improve outcomes is to improve instruction” (Barber and Mourshed, 2007). As such, maintaining and improving the quality of teaching is vital to the achievement of Lisbon goals.

As European Union Ministers of Education noted in November 2007, “High-quality teaching is a prerequisite for high-quality education and training, which are in turn powerful determinants of Europe’s long-term competitiveness and capacity to create more jobs and growth in line with the Lisbon goals.” (2007/C 300/07 of 15.11.07)

In 2008, they noted: “school education is an important means of ... passing on the values, skills, knowledge and attitudes required for democracy, citizenship, intercultural dialogue and personal development, and plays an essential role in the acquisition of the key competences needed for successful integration into economic life. Schools therefore have a duty to provide their pupils with an education which will enable them to adapt to an increasingly globalised, competitive, diversified and complex environment, in which creativity, the ability to innovate, a sense of initiative, entrepreneurship and a commitment to continue learning are just as important as the specific knowledge of a given subject.” (2008/C 319/08 of 21.11.08)

The education and training of teachers is therefore “a crucial element in the modernisation of European education and training systems”, and ministers agreed that “Member States should give high priority to sustaining and improving the quality of teacher education within a career-long perspective” (2007/C 300/07 of 15-11.07).

In their responses to the European Commission’s Communications “Improving the Quality of Teacher Education” and “Improving Competences for the 21st Century: An Agenda for European Co-operation on Schools”, EU Ministers of Education have committed themselves to a far-reaching agenda for developing policies on teacher education.

They have noted the need for better co-ordination of the various strands of teacher education; for greater incentives for teachers to update their skills throughout their professional lives, and for efforts to ensure that in-service education is responsive to teaching needs in terms of both quality and quantity. Several Member States need not only to attract new people – including suitably qualified people with experience from other professions – into the teaching profession, but also to persuade experienced teachers to remain in the profession rather than retiring early or moving to other professions.

In the light of this, Member States have agreed to work together on the following areas of teacher education policy.

A continuum of teacher education: ensuring that provision for teachers’ initial education, early career support and further professional development is co-ordinated, coherent, adequately resourced and quality assured.

Professional values: encouraging all teachers to be reflective practitioners, to be autonomous learners in their own career-long professional development, to engage in research, to develop new knowledge and be innovative.

An attractive profession: making the teaching profession a more attractive career choice and ensuring that teacher recruitment, placement, retention

and mobility policies maximise the quality of school education.

Qualifications for teaching: ensuring that teachers hold a qualification from a higher education institution² which strikes a suitable balance between research-based studies and teaching practice, possess specialist knowledge of their subjects, and the pedagogical skills required.

Supporting teachers: ensuring that teachers have access to effective early career support (induction) programmes at the start of their career, and adequate mentoring support throughout their careers. Encouraging and supporting teachers throughout their careers to review their learning needs and to acquire new knowledge, skills and competence through formal, informal and non-formal learning, including exchanges and placements abroad; supporting teacher mobility.

High-quality teacher education and continuing professional development

- improving the supply, quality and take-up of teachers' continuous professional development programmes;
- ensuring that teacher education institutions provide coherent, high-quality and relevant teacher education programmes which respond effectively to the evolving needs of schools, teachers and society at large;
- promoting, during initial teacher education, early career support and continuous professional development, the acquisition of the competences that teachers need, such as teaching transversal competences, teaching heterogeneous classes, and collaborating with colleagues and parents.

School leadership: ensuring that teachers with leadership functions, in addition to possessing teaching skills and experience, have access to quality training in school management and leadership.

Support for many of these ideas has also come from the European Parliament which in July 2008 adopted a report on improving the quality of teacher education [2008/2068(INI) of 10.7.2008]. Among other things, it called for the provision of more and better teacher education combined with policies aimed at recruiting the best candidates to the teaching profession. It emphasised that Member States must attach greater importance and allocate more resources to teacher training if significant progress is to be made in achieving the Lisbon strategy's Education and Training 2010 objectives, namely to boost the quality of education and reinforce lifelong learning across the Union. The report also called on Member States to ensure that the composition of the teaching workforce represents the society's social and cultural diversity and urged Member States to take further measures to promote teaching as a career choice for top achievers.

1.4 Peer learning in teacher education

The agenda for improving the quality of teacher education that ministers have set out is built upon detailed discussion and analysis. In particular, a group of teacher education experts nominated by education ministries met from 2002 to 2005 and agreed upon a series of Common European Principles for Teacher Competences and Qualifications³ to guide policymakers. These present a vision of the European teaching profession and were validated by a conference of ministerial and stakeholder representatives in 2005.

² In the case of those working in the field of initial vocational education, they should be highly qualified in their professional area and hold a suitable pedagogical qualification.

³ http://ec.europa.eu/education/policies/2010/doc/principles_en.pdf

Since then, the Commission and member state experts have begun to explore possible policy responses to some of the challenges identified in the conclusions of the Education Council, notably through a series of peer learning activities on areas of shared policy concern, including:

- systems of continuing professional development
- the school as a learning community for its teachers
- school leadership
- partnerships between teacher education institutions and schools
- preparing teachers for culturally diverse classrooms
- induction of new teachers
- partnerships between schools and companies.

The conclusions, in the form of succinct recommendations for policy makers, try to distil the main conditions for successful policy interventions and have been published.⁴

1.5 European Union support for the development of teacher education policy

The European Commission will continue to work closely with Member States to help them develop and modernise their education and training policies, through the Education and Training 2020 Work Programme's exchange of information, data and good practice through mutual learning and peer review.

This analysis of the data provided by the TALIS survey will provide a valuable input into European and national discussions about improving the ways in which teachers are equipped to perform the vital role that they play in society.

⁴ http://ec.europa.eu/education/school-education/doc836_en.htm

BOX 1. The teaching profession in Europe

In 2007¹ the Commission noted that the situation regarding the education of Europe's 6.25 million teachers² showed some cause for concern. For example, the profession has a high percentage of older workers; some 30% of teachers are over 50, and around 2 million may need to be replaced in the next 15 years to maintain the size of the teaching workforce.

Teachers by age (%), for ISCED 1-3	Less than 30 years old	50 years and older	60 years and older
Belgium	17.8	27.9	2.3
Bulgaria	10.1	26.2	2.2
Czech Republic	:	:	:
Denmark	:	:	:
Germany	5.1	54.7	9.3
Estonia	:	:	:
Ireland	17.5	32.8	6.1
Greece	8.3	23.0	2.6
Spain	10.3	27.6	3.9
France	13.1	31.4	1.1
Italy	2.7	47.4	5.8
Cyprus	24.9	12.7	0.6
Latvia	22.7	29.4	:
Lithuania	13.5	28.1	7.9
Luxembourg	23.2	28.2	1.5
Hungary	13.7	24.1	3.2
Malta	32.3	26.4	2.1
Netherlands	15.7	34.9	3.6
Austria	8.1	25.6	0.8
Poland	14.9	18.9	2.4
Portugal	16.5	22.1	2.4
Romania	25.6	29.8	2.9
Slovenia	11.7	19.8	1.7
Slovakia	16.1	34.8	6.4
Finland	10.0	32.5	3.5
Sweden	8.7	45.3	12.5
United Kingdom	17.9	31.9	1.5
Croatia	:	:	:
FYR Macedonia	11.1	30.9	4.1
Turkey	:	:	:
Iceland	10.5	33.1	8.3
Liechtenstein	15.2	24.2	3.2
Norway	:	:	:

Source: EUROSTAT(UOE)

*EU27 calculated with the weighed average of countries with data

1 3.8.2007, COM(2007) 392 final.

2 Study on Mobility of Teachers and Trainers, undertaken on behalf of Directorate-General for Education and Culture, 2006 (<http://ec.europa.eu/education/doc/reports/doc/mobility.pdf>).

In a recent OECD study many countries reported shortfalls in teaching skills and difficulties in updating them (OECD, 2005). Shortages related especially to a lack of competence to deal with new developments in education (including individualised learning, preparing pupils for autonomous learning, dealing with heterogeneous classrooms, preparing learners to make the most of the ICT, and so on). In 2007, the Commission noted that incentives for teachers to carry on updating their skills throughout their professional lives were weak.

As regards national legal provisions, the latest data provided by governments to Eurydice indicate that in-service training for teachers is a professional duty in 13 Member States; teachers are not explicitly obliged to undertake it in all of these.³

Some countries have difficulty retaining young teachers in the profession. However, again according to Member States' own data, only 18 Member States offer new teachers systematic support (induction) in their first years of teaching. Explicit frameworks to assist teachers who experience difficulties in performing their duties adequately later in their careers exist in most countries.

Furthermore many Member States undertake little systematic co-ordination of different elements of teacher education. This results in a lack of coherence and continuity, especially between a teacher's initial professional education and subsequent induction, in-service training and professional development. Often, these processes are not linked to school development and school improvement or to educational research.

3 For a full explanation of the data on which these tables are based, and the definitions used, see: Key data on Education in Europe, Eurydice, www.eurydice.org.

BOX 2. European Union support for teachers

Member states are responsible for the organisation and content of education and training systems. The role of the European Union is to support them. It does this in two main ways: by assisting individual teachers to undertake professional development activities, and by bringing together policy makers from the different Member States to exchange and promote good practice.

As early as 1989, the European Community had established a co-operation programme, the LINGUA programme, which included improving the in-service training of teachers and trainers. These objectives were continued and further developed by the subsequent co-operation programmes Socrates, Leonardo and Lifelong Learning.

The new Lifelong Learning Programme (2007-13) has increased support for teacher mobility and for co-operation projects between teacher education institutions (Decision 1720/2006/EC).

Under the Comenius programme, about 10 000 serving teachers every year receive financial support to undertake some form of mobility for professional development purposes; in most cases this is for attendance at a training course held abroad, but work shadowing and other professional development activities are also eligible. Around 1 200 future teachers also receive financial support to enable them to develop their teaching competences while working as an assistant in a school abroad.

The Grundtvig programme funds around 1 300 teachers a year to travel abroad for professional development purposes; every year, around 1 400 Learning Partnerships receive financial support to enable adult education staff to co-operate across national boundaries.

Under the Leonardo programme professionals in vocational education and training (mostly teachers and trainers) received support to undertake exchanges (17 000 in 2007 and 12 000 in 2008).

European Union co-operation programmes such as these are designed to complement – not to replace – Member States' existing arrangements and budgets for teacher education and professional development. They fund the participation in professional development activities each year of much less than 0.5% of all teachers in the Union.

In addition, about 100 000 teachers a year take part, alongside their pupils, in a school co-operation project, which may have benefit their professional development. The lifelong learning programme also funds transnational partnerships of teacher education institutions and similar bodies to devise and deliver innovative courses or modules in teacher education.

The European Social Fund is also an important instrument which Member States can use to support the modernisation of education and training systems, including the initial and continuing education of teachers in Member States.

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Enhancing educational effectiveness through teachers' professional development

2.1 Introduction

The TALIS survey provides information on the form, content and contextual conditions of teacher professional development in 24 countries. In addition, it gives information on teachers' characteristics, such as age, experience, formal qualifications and the school setting. Apart from professional development, the survey addresses three other substantive areas: teacher appraisal and feedback, teaching practices beliefs and attitudes, and school management.

This chapter uses a broad concept of teachers' professional development to summarise the relevant literature and guide an analysis of the TALIS data set. The research referred to in this chapter includes studies on primary and lower secondary education. Although the term "professional development" is frequently reserved for "continuous professional development in schools", professional development is viewed here as the body of systematic activities to prepare teachers for their job, including initial training, induction courses, in-service training, and continuous professional development within school settings. This last category is viewed as a form of continuous on-the-job training located in school settings (Table 2.1).

Table 2.1. Professional development broadly defined

Professional development
<ul style="list-style-type: none"> • initial training • induction courses • in service training • continuous professional development in school settings

When this definition of professional development is compared to the definition used in the TALIS survey (OECD, 2009, p. 49), the perspectives seem similarly broad: "Professional development is defined as activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher". In terms of the actual content of the study, all the elements of Table 2.1 appear to be included, except initial training. This chapter includes research results on the effects of initial training in the literature review to complete the picture of the impact of training and ongoing professional development.

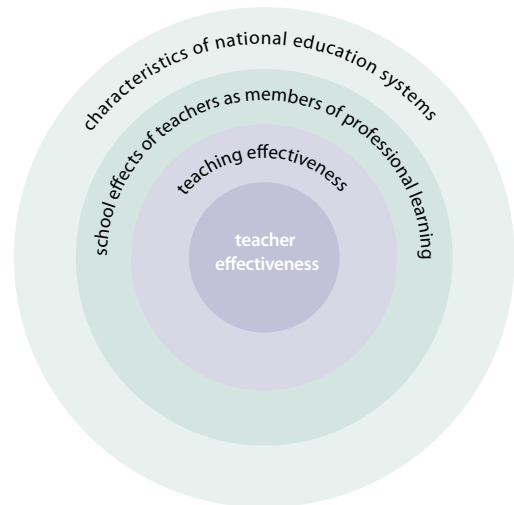
The literature review takes a performance-oriented perspective, with an emphasis on the meaning of professional development for the quality of education, in the sense of fostering educational performance and educational effectiveness. First, this represents the perspective of the TALIS study. Second, it is important to see teachers' professional development as a means of attaining the basic goals of the educational endeavour. It also acknowledges the relevance of intermediary goals, such as enhancing teachers' job satisfaction.

This perspective goes beyond seeing professional development as an end in itself and thus seeks to avoid goal displacement.

Of course, there are other ways to study the professional development of teachers – in relation to their career development, as a specific province of education, or for its specific didactic challenges, such as the fact that it is an application of adult learning. However, a performance-oriented perspective appears to encompass all of these facets, while remaining targeted at the enhancement of educational quality.

“Teachers matter” seems to be the number one truism in educational discourse. Yet, surprisingly, when it comes to explaining how teachers matter, the evidence-based picture is far less clear. For example, Rivkin, Hanushek and Kain (2005) conclude that “teachers have powerful effects on reading and mathematics achievement, though little of the variance in teacher quality is explained by observable variables, such as education or experience”. This chapter opts for treating teachers’ professional development in a context of educational quality and seeing professional development as instrumental to student learning and educational achievement. It examines the research literature on teacher effectiveness to identify critical variables that distinguish effective from less effective teachers. Teacher effectiveness is a first layer (Figure 2.1) in which teachers’ characteristics, including their beliefs and competencies, could be enhanced by training and professional development. Next, in the area of teaching effectiveness, the state of the art in instructional effectiveness research is discussed in order to identify components of effective teaching repertoires. A further layer covers teachers co-operating in work teams in the school context. At this level teachers’ impact appears in their contribution to effective structures and climates of schooling. Finally, in Chapter 3, some tentative ideas of characteristics of national educational systems that may influence professional development arrangements, such as the degree of autonomy and the operation of accountability and evaluation mechanisms, are considered.

Figure 2.1. Layers of analysis in identifying contents and forms of teachers’ professional development



The conceptual framework developed in this chapter serves as a background to the analysis of the TALIS data on teachers’ professional development. It points at interesting associations of the descriptive material on the form and content of professional development as described by the TALIS survey, with characteristics of individual teachers, the school context and the national education context. In practice, variables regarding school context, teacher background and teaching processes were all included in the TALIS survey; only data on the national context of the participating countries were not included.

Sections 2.2, 2.3 and 2.4 focus on the most relevant content of teacher training and professional development, by analysing the research literature on teacher and teaching effectiveness. These sections look into teacher characteristics such as personality, subject matter mastery, pedagogical skills, and knowledge of pedagogical content as well as varied teaching repertoires.

Section 2.5 on continuous professional development in schools has a particular emphasis on the basis of co-operation within school teams, peer review and human resources development.

Relevant dimensions of the national educational context for teacher training and professional development are treated in Chapter 3. This chapter also provides a brief summary of the state of affairs concerning professional development in European countries, on the basis of reports from the European Commission, the OECD and EURYDICE.

2.2 Teacher effectiveness

Overall effects

The typical size of teacher effects in Dutch primary schools, expressed in terms of variance components, is shown in Table 2.2. In that study the teacher effect could be estimated because in about half of the schools, teachers changed from grade 7 to grade 8, while in the other half students in grades 7 and 8 had the same teacher. The results reinforce outcomes of other studies in which some three-quarters of the school effect could be explained by teacher effects (Luyten, 1994). This “gross” effect of teachers – in other words, students taught by one teacher rather than another – is sizeable, as was also noted by Rivkin, Hanushek and Kain (2005). The next challenge is to explain this overall effect by means of observable teacher characteristics.

Table 2.2. Teacher effects in terms of variance components

	Mathematics achievement		Language achievement	
	Teacher effect NOT included	Teacher effect included	Teacher effect NOT included	Teacher effect included
Differences between classes/schools	13.4%	4.7%	3.7%	0.0%
Teacher effect	---	13.5%	---	6.1%
Differences between students	42.5%	46.8%	30.7%	32.7%
Grade level variance	44.1%	35.0%	65.6%	61.2%

Source: Luyten and Snijders, 1996.

Personal characteristics of teachers

Throughout the history of teacher and teaching effectiveness research, characteristics of teachers' personality have been investigated using variables such as flexibility/rigidity, extraversion/introversion, locus of control, self-efficacy, general and verbal intelligence (Brophy, 1983; Darling-Hammond, 1999).

In the 1960s and 1970s the effectiveness of certain personal characteristics was particularly studied. Medley and Mitzel (1963), Rosenshine and Furst (1973) and Gage (1965) are among those who reviewed the research findings. These studies found hardly any consistency between a teacher's personal characteristics, such as being warm-hearted or inflexible, and pupil achievement. More recently, Darling-Hammond (1999) concluded that the effects of general intelligence are inconsistent and small, but that some studies have convincingly demonstrated a positive impact of verbal ability.

Since the degree to which such personality characteristics are amenable to training is debatable, this area is not further addressed in this review.

Formal qualifications and experience

Effects of teacher education – usually expressed in terms of formal qualifications such as a BA or MA degree, or being certified to teach in a specific field – have traditionally been included in “education production functions”. In industrialised countries, formal qualifications do not appear to make much difference. In developing countries they more often appear to be significant. The explanation is probably that there is little variation in formal teacher training in developed countries, and teachers are more or less uniformly equipped to carry out their job. In developing countries teacher preparation is less uniformly distributed. One might say that in developed countries, cross-sectional and comparative studies do not show a strong impact from teacher education because there is a lack of variability in the variable of interest. The larger impact of teacher education in developing countries is illustrated in Table 2.3 which combines results from two meta-analyses.

Table 2.3. Percentages of studies with positive significant associations between resource input variables and achievement in industrialised and developing countries

Input	Industrialised countries % sign. positive associations	Developing countries % sign. positive associations
Teacher/pupil ratio	15%	27%
Teacher's education	9%	55%
Teacher's experience	29%	35%
Teacher's salary	20%	30%
Per pupil expenditure	27%	50%

Source: Hanushek, 1995, 1997.

These results are somewhat corroborated by US studies of alternative certification of teachers, *i.e.* other than official full teacher qualifications, as well as studies of out-of-field teaching (teaching a subject for which a teacher holds no official qualification). Wayne and Youngs (2003) summarised studies by Goldhaber and Brewer (1997 and 2000) and noted that for mathematics, results of fully certified teachers were better than those of teachers who were not formally qualified or were alternatively qualified. Similar results were not confirmed for other subjects. In a study using state level data from the United States, Darling-Hammond (1999), used a finer scale of teacher qualification, distinguishing between:

- teachers with full certification and a major in their field
- teachers with full certification
- teachers less than fully certified
- uncertified teachers.

She found substantial positive effects for certified teachers and substantial negative effects for uncertified teachers (correlations of the order of .71 to -.51).

Results of studies investigating the effects of teacher experience do not always show the expected positive effect. According to Darling-Hammond (1999, p. 9) effects are not always significant or linear.

Effects of experience are particularly visible when teachers with less than five years of experience are included in the study.

Subject matter knowledge and knowledge about teaching and learning

The most frequently used analytical variables when attempting to explain why some teachers are more effective than others are mastery of subject matter and pedagogical knowledge. In the more recent research literature, an interactive construct, combining the two, namely "pedagogical content knowledge" appears to show promising results.

Darling-Hammond (1999) refers to studies which have correlated teachers' courses in subject matter areas and scores on subject matter tests with student achievement. She concludes that the former show positive effects more frequently than the latter. Low variability in test scores is seen as the main reason for low and insignificant associations. Mastery of subject matter is seen as a basic requirement that is relatively uniformly addressed in initial teacher training. In this sense the explanation of the results in this area is the same as that for overall teacher education effects. Hawk, Coble and Swanson (1985) found that the relation between teachers' training in science and student achievement was greater in higher-level science courses.

Darling-Hammond (1999) lists some ten studies indicating that pedagogical training generally has a stronger effect than subject matter mastery. It should be noted that most of the studies referred to look at teaching methods related to subject matter. As suggested by Byrne (1983), subject matter mastery is likely to interact positively with knowledge on how to teach the subject. Wayne and Youngs, on the other hand, present results showing that pedagogical training in language teaching appeared to lower student achievement.

Pedagogical content knowledge

In his seminal article in the *Education Researcher*, Lee Shulman (1986) criticised the sharp division between subject matter mastery and teachers' pedagogical skills. He introduced the concept of pedagogical content knowledge, briefly described as "subject mat-

ter knowledge for teaching". Pedagogical content knowledge is about selection of topics, useful forms of presentation, analogies, illustrations, examples, explanations and demonstrations. Pedagogical content knowledge also includes understanding of what makes the learning of specific topics easy or difficult, including knowledge about conceptions and misconceptions that students bring to the subject. The assumption is that "deep knowledge" about the content and structure of a subject matter area is the crucial precondition for teachers' reliance on pedagogical content knowledge in their teaching. Additional components sometimes included in the concept are knowledge of the appropriate use of teaching materials and media, as well as strategic knowledge on the application of teaching strategies.

Krauss *et al.* (2008) define three main components of pedagogical content knowledge:

- knowledge of tasks
- knowledge of students' prior knowledge
- knowledge of instructional methods

These authors measured pedagogical content knowledge by means of an assessment centre type of approach, in which teachers rated real-life teaching scenarios in mathematics classes. Their results gave a basis for the hypothesis that teachers with more pedagogical content knowledge display a broader repertoire of teaching strategies for creating cognitively

stimulating learning situations. Another interesting outcome was that, particularly at higher levels in the German Gymnasium, pedagogical content knowledge was highly correlated with subject matter mastery, thus suggesting that deep knowledge of the subject matter is indeed the critical precondition for pedagogical content knowledge. Results from Baumert *et al.* (2005) show clear positive effects of pedagogical content knowledge on students' mathematics achievement.

In two interpretations of pedagogical content knowledge Gess-Newsome and Lederman (1999) make an analytical distinction that seems to have implications for teacher training. In the first interpretation, which they call "the integration model", pedagogical content knowledge is seen as the integrative results of three independent components: subject matter mastery, pedagogical knowledge and knowledge of the teaching context. The implication of this interpretation would be that training for these three components could be done separately, with integration taking place as a creative synthesis by a teaching teacher. According to the second interpretation, which they refer to as "transformational", pedagogical content knowledge is seen as a new kind of knowledge developed on the basis of subject matter mastery, pedagogical knowledge and contextual knowledge. For the first interpretation, course work in each of the components would be the most likely form of training, whereas the second would call for training *in situ*, practice simulations and observation in real-life teaching situations. The two interpretations are depicted in Figure 2.2.

Figure 2.2. Two interpretations of pedagogical content knowledge



* = Knowledge needed for classroom teaching.

Source: Gess-Newsome and Lederman, 1999, Chapter 1.

Summary

Teachers matter in terms of the quality of education. Variability in teaching quality, however, is only explained to a limited degree by characteristics such as formal education, personal characteristics and experience. When teacher preparedness is further analytically differentiated by types of knowledge, both subject matter mastery and pedagogical knowledge (particularly in the sense of subject matter didactics) are relevant. Given the kind of field research studies on which this research area depends, effect sizes are often relatively small because of a restriction-of-range phenomenon: in industrialised countries teachers often vary relatively little in terms of these characteristics. More complex “interactive” constructs such as pedagogical content knowledge are very promising for explaining differences in teacher quality, but the number of studies is too limited to draw strong conclusions.

When it comes to forms of training and professional development, a basic distinction can be made between initial training, in-service training courses, and continuous professional development in schools. All of the policy-amenable (i.e. trainable) teacher characteristics discussed in this chapter are likely to be dealt with in initial training and in-service training. Although pedagogical content knowledge might be seen as having a place in continuous professional development, as it would benefit from thinking about teaching and learning in actual practice, it is probably too dependent on expert guidance and support to be realistically left to school staff.

2.3 Teacher beliefs and competencies

This section distinguishes two areas: teaching styles and competencies and teacher beliefs (in the sense of preferred teaching paradigms).

Teaching styles and competencies

In the history of research on teaching the focus on personal characteristics of teachers was followed by an interest in teaching styles and repertoires. When studying teaching styles (Davies, 1972),

more attention was focused on the behavioural repertoire of teachers than on deeply rooted aspects of their personality. Within the framework of “research on teaching”, there followed a period in which much attention was paid to observing teacher behaviour during lessons. The results of these observations rarely revealed a link with pupil performance (e.g. Lortie, 1973). In a following phase, more explicit attention was given to the relation between observed teacher behaviour and pupil achievement. This research is identified in the literature as “process-product studies”. Lowyck, quoted by Weeda (1986, p. 68), summarises variables which emerged “strongly” in the various studies:

1. *Clarity*: clear presentation adapted to suit the cognitive level of pupils.
2. *Flexibility*: varying teaching behaviour and teaching aids, organising different activities, etc.
3. *Enthusiasm*: expressed in verbal and non-verbal behaviour of the teacher.
4. *Task-related and/or businesslike behaviour*: directing the pupils to complete tasks, duties, exercises, etc., in a businesslike manner.
5. *Criticism*: much negative criticism has a negative effect on pupil achievement.
6. *Indirect activity*: taking up ideas, accepting pupils’ feelings and stimulating self-activity.
7. *Providing the pupils with an opportunity to learn criterion material*, that is, a clear correspondence between what is taught in class and what is tested in examinations and assessments.
8. Making use of *stimulating* comments: directing the thinking of pupils to the question, summarising a discussion, indicating the beginning or end of a lesson, emphasising certain features of the course material.
9. *Varying the level* of cognitive questions and cognitive interaction.

Weeda (1986, p. 69) noted that in the study from which these nine teaching characteristics were drawn, there was much criticism regarding methodology/technique.

During the last five years or so, there has been renewed interest in effective teacher characteristics. In the United Kingdom, Hay McBer (2000, cited by Anderson, 2004) identified twelve characteristics, in

the sense of relatively stable traits, associated with effective teachers (Table 2.4) These are closer to learnable competencies than to personality characteristics, although they are clearly linked to them.

Motivational aspects are strongly represented in this list. The issue of teacher motivation is associated with teacher beliefs systems about preferred teaching strategies. These are discussed below.

Table 2.4. Summary of characteristics associated with more effective teachers

Cluster	Characteristic	Description
Professionalism	Commitment	Commitment to do everything possible for each student and enable all students to be successful
	Confidence	Belief in one's ability to be effective and to take on challenges
	Trustworthiness	Being consistent and fair; keeping one's word
	Respect	Belief that all persons matter and deserve respect
Thinking/ reasoning	Analytical thinking	Ability to think logically, break things down, and recognise cause and effect
	Conceptual thinking	Ability to see patterns and connections, even when a great deal of detail is present
Expectations	Drive for improvement	Relentless energy for setting and meeting challenging targets, for students and the school
	Information-seeking	Drive to find out more and get to the heart of things; intellectual curiosity
	Initiative	Drive to act now to anticipate and pre-empt events
Leadership	Flexibility	Ability and willingness to adapt to the needs of a situation and change tactics
	Accountability	Drive and ability to set clear expectations and parameters and hold others accountable for performance
	Passion for learning	Drive and ability to support students in their learning and to help them become confident and independent learners

Source: Adapted from Hay McBer (2000) by Anderson (2004), p. 15.

Teacher beliefs

Constructivism versus “traditionalism”

During the last three decades two basic teaching and learning paradigms have dominated professional discourse: constructivist-inspired teaching versus more structured (also often qualified as traditional) teaching. The two paradigms are the basis of divergent beliefs about teaching and learning.

Constructivism views reality as being in the mind of the knower, without denying external reality altogether (solipsism), although some radical constructivists come very close to complete denial. The image of student learning that goes

with constructivism underlines the active role of the learner. Students are to be confronted with “contextual” real-world environments or “rich” artificial environments simulated by means of interactive media. Learning is self-regulated with lots of opportunity for discovery and students' interpretation of events.

Learning strategies, learning to learn and reflecting on these learning strategies (meta-cognition) are as important as mastering content. Different ways of finding a solution are as important as the solution itself. Terms like “active learning” (Cohen, 1988), “situated cognition” (Resnick, 1987) and “cognitive apprenticeship” (Collins, Brown and Newman, 1989) are used to describe student learning.

The other side of the constructivist coin is teaching and instructional technology that enable students “to construct their own meaningful and conceptually functional representations of the external world” (Duffy and Jonassen, 1992, p. 11). The teacher becomes more of a coach who assists students in “criss-crossing the landscape of contexts”, looking at the concept from a different point of view each time the context is revisited (Spiro et al., 1992, p. 8). Cohen (1988) adopts the term “adventurous teaching”.

There is less emphasis on structuring goals, learning tasks and plans in advance; goals are supposed to emerge when situated learning takes place and plans are not so much to be submitted to the learner as constructed in response to situational demands and opportunities.

Learning situations must be such that students are invited to engage in sustained exploration of real-life content or simulated environments. Some authors writing from this perspective state that “transfer” is the most distinguishing feature (Tobias, 1991), whereas others mention argument, discussion and debate to arrive at “socially constructed meaning” (Cunningham, 1991).

The role of the assessment and evaluation of students’ progress is hotly debated. Radical constructivists take the position that performance on an actual learning task is the only legitimate way to assess, since distinct “external” evaluation procedures cannot do justice to the specific meaning of a particular learning experience for the student.

Others (e.g. Jonassen, 1992) conclude that from a constructivist perspective assessment procedures should merely be different: goal-free, rather than fixed on particular objectives, formative rather than summative, and oriented to assessing learning processes rather than mastery of subject matter. Appraisals of samples of products, portfolios and panels of reviewers that examine authentic tasks are also mentioned as acceptable procedures.

Table 2.5 contrasts some of the major distinguishing features of learning and instruction according to the constructivist position with characteristics of more traditional instructional models such as direct instruction and mastery learning.

Bipolar comparisons such as those in Table 2.5 run the risk of over-simplification and polarisation. It should be emphasised that less extreme constructivist views can be reconciled with more “objectivist” approaches (Merrill, 1991). Also, more eclectic approaches are feasible, as when more teacher-controlled and learner-controlled instructional situations are used alternately (Boekaerts and Simons, 1993).

Creemers (1996) considers the changed perspective on the role of the student as the essential difference between the newer, constructivist views on learning and instruction, and the older models: a rather passive student in models originating from the Carroll model and an active student who develops knowledge and skills by working with context, in the newer models.

Table 2.5. Comparison of traditional and constructivist instructional models

Traditional instruction	Instruction inspired by constructivism
Emphasis on basic skills	Bias towards higher order skills
Prior knowledge as entrance behaviour	Framing role of prior knowledge in a cognitive and motivational sense
Subject matter orientation	Emphasis on learning process
Structured approach: <ul style="list-style-type: none"> • pre-specified objectives • small steps • frequent questioning/feedback • reinforcement through high percentage of mastery 	Self regulated learning: <ul style="list-style-type: none"> • “rich” learning environment • intrinsic motivation • challenging problems
Abstract-generalisable knowledge	Situation-specific knowledge Learning from cases
Standardised achievement tests	Assessment; less circumscribed alternative procedures

Source: Adapted from Scheerens, 1994.

Brophy also describes a way to integrate established principles of structured classroom management and self-regulated learning strategies. Elements of effective classroom management such as “preparation of the classroom as a physical environment suited to the nature of the planned academic activities, development and implementation of a workable set of house-keeping procedures and conduct rules, maintenance of student attention and participation in group lessons and activities, and monitoring of the quality of the students' engagement in assignments and of the progress they are making toward intended outcomes” (Brophy, 1996, pp. 3,4), are equally relevant when instruction is seen as helping students to become more autonomous and self-regulated learners.

When it comes to implementing the new instructional principles, Brophy points to a “guided”, gradual approach in which learning goals and expectations are clearly articulated, and students are helped by means of modelling and providing cues. He also stresses that, initially, students may need a great deal of explanation, modelling and cuing of self-regulated learning strategies. As they develop expertise, this “scaffolding” can be reduced.

Ravitz, Becker and Wong (2000) investigated the degree to which American primary and secondary school teachers believed in what they call “the traditional transmission of instruction” perspective or “the constructivist compatible view of instruction”. Roughly their findings indicate that adherents of the two paradigms are about evenly distributed, with some subgroups supporting the one more than the other. For example, primary school teachers have constructivist beliefs more frequently than secondary school teachers, and mathematic teachers in secondary schools support the traditional view more frequently than the constructivist view, a pattern that is reversed for English language teachers. These authors also found a fair consistency between constructivist beliefs and patterns of actual teaching practice (measured on the basis of self-reports); correlations between beliefs and stated practice were of the order of .31 to .65.

A study of Dutch secondary schools (Meirink, Meijer and Verloop, 2007) showed, on the one hand, that constructivist teaching behaviour could be shaped by national policy and, on the other, that teachers, after experimenting with it, opted for more traditional teaching centred on the subject matter. Constructivist teaching had been officially propagated as the preferred strategy in upper secondary schools, but this orientation was later severely criticised, after a parliamentary committee reviewed the effects of this reform policy in 2007.

Research on the beliefs about independent and self-regulated learning of 260 Dutch teachers in secondary, vocational and adult education showed that teachers' beliefs are more process-oriented (*i.e.* constructivist) than traditional (oriented towards knowledge transmission) (Bolhuis, 2000; Bolhuis and Voeten, 2004). Based on an observational study in which 130 lessons of 68 teachers in upper secondary education classes of six schools were observed, however, Bolhuis and Voeten (2001) conclude that teaching is best characterised as “activating”, that is, located somewhere between traditional and process-oriented. Thus, instruction in these 130 lessons was mostly not classified as traditional (with an accent on knowledge transmission), but there also hardly appeared to be process-oriented instruction reflecting features of independent and self-regulated learning (only 5% of the observed lesson time). Furthermore, no convincing relation was found between teachers' concepts of student learning and their teaching (Bolhuis, 2000).

Van Veen *et al.* (2001) explored the orientations of 452 Dutch secondary school teachers with respect to three aspects of their work: instruction, educational goals and the role of the teacher in the school organisation. Based on the literature, they distinguished six professional orientations to three aspects of teachers' work: a transmission orientation *versus* a self-directed learning orientation (instruction); an orientation towards qualification *versus* an orientation towards personal and moral development (educational goals); and a restricted *versus* an extended orientation (role of the teacher

within the organisation). The results showed that teachers are more learning-oriented than oriented to the transmission of knowledge (instruction). They also consider the qualification of students for their development as more important than their moral development (educational goals). About a third of the teachers had a restricted orientation towards their role in the school organisation.

Furthermore, the findings showed that teachers' subjects were related to their professional orientations: mathematics and science teachers appeared to differ from social studies teachers in being more oriented towards transmission of knowledge than towards moral development. They also considered consultations with their subject colleagues as more important than social studies teachers.

Teachers' sense of efficacy

Research has indicated that teachers' beliefs about their own level of competence and their sense of self-efficacy affect their practice and students' performance (e.g. Ashton and Webb, 1986; Midgley, Feldlaufer and Eccles, 1989; Ross, Hogaboam-Gray and Hannay, 2001). Self-efficacy is a future-oriented belief about the level of competence a person expects he or she will display in a given situation (Bandura, 1997). When teachers have a high sense of self-efficacy they are more creative in their work, intensify their efforts when their performances fall short of their goals and persist longer. Teachers' sense of self-efficacy can thus influence the learning and motivation of students, even if students are unmotivated or considered difficult (Guskey and Passaro, 1994). Although negative correlations between teachers' sense of self-efficacy and students' self-concept of ability and self-reliance have been found (Brookover *et al.*, 1979), most studies have found a positive relation between teachers' efficacy beliefs and several student cognitive outcomes, such as achievement in core academic subjects (e.g. Anderson, Greene and Loewen, 1988; Ashton and Webb, 1986; Moore and Esselman, 1994) and performance and skills (Midgley, Feldlaufer and Eccles, 1989; Ross, Hogaboam-Gray and Hannay, 2001).

Teachers' perceived self-efficacy not only affects students' motivation directly but also indirectly via the instructional strategies teachers use to create a supportive learning environment (Ashton and Webb, 1986; Dembo and Gibson, 1985). Teachers with a strong sense of efficacy tend to exhibit greater levels of planning and organisation, are more open to new ideas and more willing to experiment with new methods, work longer with students who are struggling, and exhibit greater enthusiasm for teaching (Tschannen-Moran and Woolfolk Hoy, 2001).

Research into the effects of teachers' sense of self-efficacy has indeed shown that it positively influences teacher's practices (Smylie, 1988; Geijsel *et al.*, 2009; Wheatley, 2002). Teacher efficacy therefore seems to be a rather strong predictor of how teachers shape their teaching practices in order to encourage student's motivation and performance.

In line with research on the effects of individual teachers' efficacy, scholars have recently started to examine the role of collective efficacy on teachers' practices and student outcomes. Collective teacher efficacy refers to "the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students" (Goddard, Hoy and Hoy, 2000, p. 480). Because collective teacher efficacy refers to expectations of the effectiveness of the staff to which one belongs, it differs from individual teacher self-efficacy. Although conceptually different, research has shown that collective and individual sense of efficacy has similar effects on extra efforts for the organisation (Somech and Drach-Zahavy, 2000; Ross and Gray, 2007) and on student achievement (Goddard, 2001; Goddard and Goddard, 2001; Goddard, Hoy and Hoy, 2000; Ross, Hogaboam-Gray and Gray, 2003).

2.4 Teaching effectiveness

Whereas teacher effectiveness deals with characteristics of teachers, teaching effectiveness concerns the teaching process. It is beyond the scope of this chapter to review the literature on teaching effectiveness in any depth. However, it is useful to intro-

duce some basic distinctions and overall research evidence because awareness of what helps make effective teaching can provide potential orientations for teacher training and professional development. Teachers' knowledge and skills in areas highlighted in the effective teaching research could be important components of trainable or learnable teaching repertoires.

In theory it would be legitimate to influence teachers' belief systems with respect to "traditional" and constructivist teaching paradigms only if one model gave superior results in terms of student learning and achievement. In reality matters are more complex, first because adherence to a certain teaching paradigm may be based on fashion, preference for "something new" or a persuasive argument, and second because the two paradigms have rarely been set against one another in critical experiments. Instead, research on teaching and instructional effectiveness has looked into teaching factors that are quite mixed in terms of the two paradigms. In fact, factors that can be aligned with one or the other of these paradigms are quite strongly associated with achievement. Thus, the research evidence does not unequivocally favour one over the other.

Teaching is a complex endeavour, involving classroom management, lesson preparation and organisation of teaching and learning activities, creating and maintaining a certain climate, and evaluation and feedback. Broadly speaking there is consensus on what constitutes good teaching.

Brophy (2001) distinguishes 12 principles of effective teaching:

1. *Supportive classroom climate:* students learn best within cohesive and caring learning communities. The role of the teacher as model and socialiser is emphasised.
2. *Opportunity to learn:* students learn more when most of the available time is allocated to curriculum-related activities and the classroom management system emphasises maintaining students' engagement in those activities.
3. *Curricular alignment:* All components of the curriculum are aligned to create a cohesive programme for accomplishing instructional purposes and goals.
4. *Establishing learning orientations:* teachers can prepare students for learning by providing an initial structure to clarify intended outcomes and cue desired learning strategies (e.g. providing advance organisers and cuing the kind of responses that are expected).
5. *Coherent content:* to facilitate meaningful learning and retention, content is explained clearly and developed with an emphasis on its structure and connections. When making presentations, providing explanations, or giving demonstrations, effective teachers project enthusiasm for the content and organise and sequence it so as to maximise its clarity and "learner friendliness".
6. *Thoughtful discourse:* questions are planned to engage students in sustained discourse structured around powerful ideas.
7. *Practice and application activities:* students need sufficient opportunities to practice and apply what they are learning and to receive improvement-oriented feedback.
8. *Scaffolding students' task engagement:* the teacher provides whatever assistance students need to enable them to engage in learning activities productively. Structuring and support can be lessened as the students' expertise develops.
9. *Strategy teaching:* the teacher models and instructs students in learning and self-regulation strategies. Meta-cognitive awareness and self-regulation are sought in contexts like problem solving and general learning and study skills. An example is a teacher who thinks out loud while modelling use of the strategy. Students are stimulated to monitor and reflect on their learning.

10. *Co-operative learning*: students often benefit from working in pairs or small groups to build understanding or help one another master skills.
11. *Goal-oriented assessment*: The teacher uses a variety of formal and informal assessment methods to monitor progress towards learning goals. Comprehensive assessment also examines students' reasoning and problem-solving processes.
12. *Achievement expectations*: the teacher establishes and follows through on appropriate expectations for learning outcomes.

and feedback). The next interesting point is the incorporation of some ideas from constructivism: attention to modelling self-regulated learning as well as meta-cognitive processes.

Baumert, Blum and Neubrand (2001) interpret instruction as an opportunity structure for insightful learning. "This means that instructional materials, task selection, and instructional processes are analyzed from the perspective of whether they foster or obstruct active individual knowledge acquisition. ... Dimensions of this opportunity structure include the safeguarding of the social action framework by means of appropriate classroom management; pacing and range of learning opportunities (quantity of instruction); general instructional quality, in particular the didactical quality of the structure and realization of the instruction; and the quality of teacher-student and student-student relations."

It is interesting to note that quite a few of Brophy's principles are variations on the theme of structured teaching (advance organisers, stating clear goals, scaffolding, frequent monitoring

Table 2.6. Overview of teaching variables

Teacher background characteristics	Classroom ecology and climate	Teaching processes
Professional knowledge <ul style="list-style-type: none"> • content knowledge • pedagogical knowledge • insight in student learning • pedagogical content knowledge 	<ul style="list-style-type: none"> • class size • classroom composition (average and heterogeneity) • match of teachers and classes • aspects of classroom climate, achievement orientation, discipline, support, ethos • teacher expectations on students' achievement 	Pro-active strategies <ul style="list-style-type: none"> • opportunity to learn • selection and design of adequate learning tasks • technology enriched learning environments
Professional motivation <ul style="list-style-type: none"> • work satisfaction • locus of control 		Interactive strategies <ul style="list-style-type: none"> • classroom management aimed at optimising active learning time and opportunity to learn • optimising structure and independence in teaching • allowing for manageable adaptivity in teaching • active teaching, diversity in preparation formats • a challenging presentation; cognitive activation; • enacting high expectations
Preferred teaching styles <ul style="list-style-type: none"> • direct teaching • "constructivist" teaching 		Retroactive strategies <ul style="list-style-type: none"> • setting realistic motivating standards • progress monitoring and assessment • adaptive testing • instrumental feedback

Source: Scheerens, 2007.

Scheerens (2007) has provided a schematic overview of variables in teaching (Table 2.6). In a recent meta-analysis, Scheerens (2008) summarised instructional variables according to six broad concepts:

- a curricular dimension, containing opportunity to learn, strategies to learn about the deep structure of domain-specific knowledge, and textbooks;
- a teacher-orchestrated classroom management and climate creation dimension, including time, achievement orientation, high expectations, disciplinary climate, activating measures such as variation in representation formats, media, forms of practice, variation in applications (theoretical and authentic) grouping forms and differentiation/adaptive teaching;
- a teaching strategy dimension with two main sub-categories:
 - a) structured, direct teaching, mastery of learning orientation, drill and practice;
 - b) constructivist oriented teaching strategy, teaching meta-cognitive strategies, cognitive activation, frequent open learning tasks, discovery learning, fading from more structured to more open assignments;
- a climate dimension, support and positive interactions;
- a dimension representing evaluation and feedback.

The results of the meta-analysis are summarised in Table 2.7.

Table 2.7. Results of the meta-analysis on teaching factors (6 categories)

Category		Mean eff.	St. error	p	Count
I	Curricular	.077	.023	.001	61
II	Teacher-orchestrated classroom management	.095	.010	.000	304
III	Teaching strategy (structured, direct, mastery, etc.)	.087	.015	.000	165
IV	Teaching strategy (constructivist-oriented, etc.)	.135	.008	.000	542
V	Climate, support, positive interactions	.117	.011	.000	180
VI	Feedback/ monitoring/ assessment/ tests	.065	.017	.000	152

Source: Scheerens, 2008.

Instructional variables under constructivist-oriented teaching strategies had the highest mean effect size across studies. Among the individual variables included in this broad category, learning to learn subject-specific learning strategies had the highest effect size (see also Seidel and Shavelson, 2007). Learning subject-specific learning strategies has some resemblance to pedagogical content knowledge, discussed above. It involves two main components: the deep structure of the subject matter taught as well as meta-cognitive strategies, such as self-monitoring the learning process. Earlier reviews and meta-analysis of teaching effectiveness usually found the highest coefficients for elements of structured teaching,

such as reinforcement and feedback (*e.g.* Fraser *et al.*, 1987). The interpretation of the current findings, summarised in Table 2.7, combines features of direct instruction and constructivist-oriented teaching. Application would call for broad teaching repertoires in which elements of pre-structuring and scaffolding would be combined with elements of self-regulated learning and guided reflection on learning processes.

Summary

Teaching effectiveness research underlines the complexity of the teaching act. Constructivist ideas have gradually been incorporated in teaching

models and practices along with more traditional approaches. The analysis of teaching in this research tradition underlines that teaching has many facets. The best lesson for practice would seem to be for teachers to master a broad spectrum of classroom organisational and teaching skills. Therefore, teacher training and professional development of teachers precede the ambitious task of providing teachers with rich teaching repertoires.

2.5 Continuous professional development of teachers within schools

Since student outcomes depend greatly on teacher quality, governments, local politicians and school managers need to foster teachers' continuous professional development in order to cope effectively with ongoing changes and improve the quality of education. Strengthening internal school conditions to promote teachers' professional development is considered an important prerequisite for addressing a continuous stream of changes in their environments (*e.g.* demographic changes, large-scale educational innovations, socio-cultural renewal), the multidimensional restructuring demands to which they must respond, and the considerable external pressures arising from the tighter "output" controls introduced by accountability policies. Furthermore, promoting the professional development of teachers is also expected to reduce the alienation that bureaucracy may produce.

Most professional development efforts in the late 1980s and early 1990s were based on a training paradigm which implied a deficit-mastery model and consisted of "one-shot" professional development approaches. Research on these programmes has provided evidence of the failure of earlier concepts of teacher learning as something that is done to teachers (Richardson and Placier, 2001; Clarke and Hollingsworth, 2002). These findings and increased criticism have provided an impetus for many researchers to reconceptualise teachers' professional development by taking a "change as professional growth or learning" perspective to professional development. Inspired by adult learning theories and in line with situated cognitive

perspectives on learning (Anderson *et al.*, 2000; Clarke and Hollingsworth, 2002; Jarvis, 1987; Kwakman, 2003; Putnam and Borko, 2000; Smylie, 1995), teacher learning is seen as an active and constructive process that is problem-oriented, grounded in social settings and circumstances, and takes place throughout teachers' lives. As a consequence, researchers have emphasised the notion of ongoing and lifelong professional learning embedded in schools as a natural and expected component of teachers' professional activities and a key component of school improvement (Putnam and Borko, 2000; Slegers, Bolhuis and Geijssel, 2005; Smylie and Hart, 1999).

From this perspective, the focus of teacher learning is on professional activities in schools and on participation in a community of learners (Sfard, 1988; ten Dam and Blom, 2006). This perspective on learning implies that teachers take responsibility for their own actions and acquire the necessary knowledge, skills and repertoire of activities to increase their participation in the school workplace environment. By participating in a variety of professional activities within the school context, teachers stimulate both their own professional development and the development of the school and thus make a significant contribution to improving educational practice. In this sense attention is paid to teachers as members of a (semi) profession in which "teachers acquire new knowledge, skills and values, which will improve the service they provide to clients" (Hoyle and John, 1995, p. 17), and "take the responsibility for this acquiring of new knowledge and skills" (Knoers, 1987). In other words, teachers are supposed to act according to the concept of "reflective practitioners" (Schön, 1983).

In order to improve schools as places for teachers to learn, it is important to acknowledge that not all teachers' learning is conducive to promoting professional development and school improvement. Acknowledging this raises the important questions of which professional activities can improve teachers' participation in school practice and which type of teacher learning needs to be promoted. Based on the available literature and research, the following professional learning activities, which are crucial for enabling teachers to deal with the rapid changes

they face, can be distinguished: keeping up to date (collecting new knowledge and information: Kwakman, 2003; Geijsel *et al.*, 2009); experimentation (Kwakman, 2003; Smylie, 1995); reflective practice (giving and asking for feedback: Jarvis, 1987; Smylie, 1995; Van Woerkom, 2004; Runhaar, 2008; Smylie, 1995; Geijsel *et al.*, 2009); knowledge sharing (van Woerkom, 2004, Ruhnaar, 2008); and innovation (Janssen and van Yperen, 2004; Runhaar, 2008; Geijsel *et al.*, 2009).

During the last decade researchers have paid attention to conditions affecting teacher learning. In most cases, only one theoretical perspective (psychological or organisational) is taken into account. In a first line of research, the role of psychological factors in explaining teachers' learning is examined. This line of research includes studies that attempt to elucidate the influence of teachers' cognition and motivation on teacher learning.

A second line of research comprises studies about organisational learning and professional learning communities, in which organisational conditions, including leadership, are considered the main levers of a school's capacity to change and a prerequisite for linking teachers' professional development to school development (Leithwood and Louis, 1998; Toole and Louis, 2002; Slegers and Leithwood, in press). These studies often use system theory on change that links structural, cultural and political dimensions of school workplace environments to professional learning.

There is evidence that the two separate lines of research point to important preconditions affecting teacher learning. For the individual, individual capacity to learn and actively (re)construct and apply knowledge is stressed. This seems to be influenced by psychological factors such as career motivation, self-concept, self-efficacy, teacher autonomy and perceived control, and teachers' sense making (Coburn, 2001, 2004; Rosenholtz, 1991; Spillane, Reiser and Reimer, 2002; van Veen, Slegers and van den Ven, 2005; Runhaar, 2008). The characteristics of the task to be carried out may also play a role in how motivated staff is to learn, *e.g.* the degree of task control and the extent of task variation (Kwakman, 2003).

Among the organisational conditions that influence learning among staff, the role of school leaders is a key factor, especially when it is inspired by the concept of transformational leadership. Research findings on transformational leadership in educational settings identified three core dimensions: vision building, providing individual support and providing intellectual stimulation (Geijsel *et al.*, 2003; Leithwood, Jantzi and Steinbach, 1999; Nguni, Slegers and Denessen, 2006). Among organisational conditions, teacher collaboration aimed at improving instruction and education is also quite relevant (Zwart, 2007). Co-operative and friendly collegial relationships, open communication, and the free exchange of ideas may be sources of emotional and psychological support for teachers' work and promote their professional development (Geijsel *et al.*, 2001; Rosenholtz, 1991; Rowan, 1995; Smylie, 1988). The intensity of co-operation and learning among staff, as well as the development of the school as a whole, depend on the degree to which schools create opportunities for teachers' professional learning (Clement and Vandenberghe, 2000; Slegers, Geijsel and van den Berg, 2002).

Moreover, findings show that task and outcome interdependence may affect group effectiveness and create opportunities for professional development (van der Vegt, Emans and van de Vliert, 1998; Runhaar, 2008). As Wageman (1995) mentioned, task and outcome interdependence may enhance the development of group norms and influence team and individual learning within organisations.

Furthermore, research has shown that teachers' participation in decision making, which supports an "organic" form of school organisation, has positive effects on teachers' motivation and commitment to change (*e.g.* Jongmans *et al.*, 2004; Smylie, Lazarus and Brownlee-Conyers, 1996; Geijsel *et al.*, 2001, 2009). Moreover, professional learning also depends on the availability of relevant data and agreed standards for interpreting the data. Learning is only possible if school staff are provided with information on important school issues (*e.g.* developments in student performance or the extent of parental participation) (Leithwood, Aitken and Jantzi, 2001; Earl and Katz, 2006).

Although scholars have stressed the need for research that focuses on the interplay of psychological factors, leadership and organisational conditions and uses different perspectives and multi-level models (Richardson and Placier, 2001; Smylie, 1988; Smylie and Hart, 1999), systematic research is scarce. The results of the few available studies show that psychological factors have relatively large effects on teacher learning. The influence of different dimensions of leadership and organisational conditions on professional learning appears to be mediated by these factors (Kwakman, 2003; Smylie, 1988; Smylie, Lazarus and Brownlee-Conyers, 1996; Geijsel *et al.*, 2009).

Recently, researchers have pointed to the importance of freeing the organisation from traditional structures, empowering teachers through collaboration, and developing cultures that value shared responsibilities and values, using the concept of the professional learning community (PLC) (Mitchell and Sackney, 2000; Stoll *et al.*, 2006; Toole and Louis, 2002). The PLC concept is based on two assumptions. First, in line with current situated theories of learning, it is assumed that knowledge and learning are embedded in social contexts and teachers' experience and can be promoted through reflection and social interactions. Second, it is assumed that participation in a PLC leads to changes in teaching practices and subsequently enhances student learning. Although researchers use different key indicators and variables to describe and measure these communities and terms such as professional community (Louis and Kruse, 1995); school-based teacher learning community (McLaughlin and Talbert, 2006); learning community (Mitchell and Sackney, 2000) and school learning community (Sackney *et al.*, 2005), they generally conceptualise a professional community as including dimensions such as a focus on student learning, shared values and vision, collective responsibility, reflective professional inquiry, collaboration and group and individual learning (Stoll *et al.*, 2006).

Most of the early work on professional learning communities focused on demonstrating the existence of schools as PLCs by reporting on teachers' perceptions of PLCs' essential characteristics. Only recently have researchers started to examine their impact on

changes in teachers' practices and student learning. In their recent review, Vescio, Ross and Adams (2008) found 11 empirical studies that analyse the impact of professional learning communities on teachers' practice and student learning. These studies support the idea that participation in a professional learning community leads to changes in teaching practices as teachers become more student-centred. In addition, the teaching culture improves because a professional learning community increases collaboration, a focus on student learning, teacher authority and continuous teacher learning. The literature also provides some evidence for the claim that student learning increases when teachers participate in professional learning communities (Bolam *et al.*, 2005; Lee and Smith, 1996; Louis and Marks, 1988; Supovitz, 2002). In these studies gains in student achievement scores varied with the focus of teachers and teams, the strength of the PLC (measured as an aggregate index), the extent to which teachers take responsibility collectively for students' academic success or failure, the amount of co-operation among teachers, and the support for professional learning. Furthermore, the data across the studies indicate that a focus on student learning and student needs is a key element of successful professional learning communities. Based on their review, Vescio, Ross and Adams (2008) concluded that the few studies available clearly demonstrated that PLCs have an impact on teachers' practice and student learning. The school contextual variables in the TALIS survey provide some representation of the key characteristics of professional learning communities, specifically school characteristics such as a co-operative climate and evaluation and feedback mechanisms. The survey also distinguishes between individual and collective professional development, the latter matching the philosophy of professional learning communities as a context for continuous professional development.

Although there are indications that schools with these characteristics do indeed promote educational change and enhance student learning, it is necessary to find more rigorous and robust evidence for the claim that continuous professional development in schools can sustain improvement and enhance student learning. Furthermore, the available knowledge base on teacher learning and

conditions fostering teachers' professional development in the workplace is very fragmented: the different studies do not inform each other and rely on different concepts, methods and instruments (Verloop and Kessels, 2006). The fragmented nature of the research on continuous professional development of teachers in schools hinders theory building and the testing of complex multi-level models explaining the impact of teachers' learning on the quality of instruction and student learning. These more complex models are needed to understand the dynamic and recursive links between conditions and effects and how collaboration, participation, leadership, teaming and the like can be an input, throughput, or outcome of learning processes (Imants, Sleegers and Witziers, 2001). Finally, more research is needed to shed light on the nature and process of ongoing teacher learning, school improvement and student learning, using mixed-method and valid and reliable longitudinal data sources (Sleegers and Leitwood, in press; Vescio, Ross and Adams, 2008).

2.6 Discussion: implications for the analysis of professional development from the TALIS data set

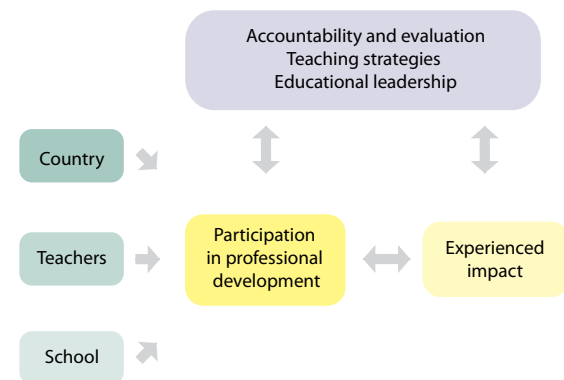
In the TALIS survey the aspects of teachers' professional development addressed in the research literature are fairly well represented:

- central variables are teachers' participation in professional development activities and the experienced impact;
- identification of a broad range of topics that are dealt with in professional development activities, some closer to subject matter mastery and didactics, others closer to skills that are addressed in the human resource development (HRD) approach to continuous teachers' professional development;
- preferred teaching strategies, as they are correlated with preferred substance (experienced needs and barriers) of professional development;
- relevant characteristics of the school context, both objective background characteristics, such as school size, and more "policy-rich" factors, such as those concerned with educational leadership and evaluation and review activities;
- finally, descriptive teacher background characteristics, such as age, gender and experience, which may be associated with their attitudes *vis-à-vis* professional development activities.

Given the state of the art of the knowledge base and the descriptive, cross-sectional nature of TALIS, the conceptual framework is rather simple and its aim is closer to exploration than to explanation.

Basically the model addresses teacher, school and country-level variables which affect participation in teachers' professional development activities and the way in which this is associated with other school policies (school management, evaluation and review, and preferred teacher style) and with the experienced impact of professional development, as indicated in Figure 2.3.

Figure 2.3. Conceptual model



This model guides the analysis in the sense that the more descriptive presentations, addressed in Chapter 4 of the report, adhere to simple correlations between pairs of variables, and the more complex associations to be discussed in Chapter 5 are addressed by means of multi-level analyses and covariance structure analysis.

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Teachers' professional development in Europe: results from earlier studies

3.1 Introduction

This chapter summarises teachers' professional development in Europe by reviewing recent studies by the OECD (2005) and the European Commission and Eurydice (Eurydice, 2003, 2007, 2008; European Commission, 2009). This overview can serve as prior information on the professional development of teachers in the European countries participating in TALIS. This chapter also discusses policy-amenable characteristics of national educational systems that may have consequences for aspects of teachers' professional development. The main policy areas discussed are decentralisation and accountability. The conclusion presents some tentative hypotheses about the influence of system-level characteristics on teachers' professional development arrangements.

3.2 Descriptive information on teachers' professional development and adult learning in Europe

Information sources

Comparable quantitative data on professional development are scarce at both national and international levels. The OECD study entitled *Teachers Matter: Attracting, Developing and Retaining Effective Teachers* (OECD, 2005) examined the availability of quantitative data in the 25 participating countries for six areas: the teaching profession and the

teaching workforce, preparation and development of teachers, demand for teachers, career opportunities and incentives, the structure of the teacher labour market, and school processes.

Concerning initial teacher education at national level, all countries indicated a general availability of data on entrance requirements and aspects of the structure of the programmes (diversity of routes and organisation of programmes). Most countries also reported having data on the content and emphasis of programmes (*i.e.* knowledge of subject matter, pedagogical preparation and practical school experience), on links and partnerships with the schools, and on alternative programmes of initial teacher education.

With regard to professional development, at national level, all countries reported having data on minimum legal requirements for teachers and links between professional development and promotion and certification. In addition, some countries indicated also having information on other aspects of professional development (such as participation levels, content and organisation of professional development activities, identification of needs and priorities, and school-based provision).

At international level, countries indicated having some data on initial teacher training (entrance requirements and aspects of the structure of the programme) but almost no data on professional development (OECD, 2005).

For the OECD study, participating countries drew on existing data sets to supply the data. In addition, all countries prepared a country background report according to a common framework, and nine countries were visited by a team of reviewers. The quantitative and qualitative information was used to compile the report entitled *Teachers Matter* (OECD, 2005). Depending on the source, the data reference period ranged from 2001 to 2004.

EU reports have published basic, mainly qualitative data on professional development of teachers. The most relevant are:

- *Key Data on Education in Europe* (published by the European Commission and Eurydice) (seventh edition) (European Commission, 2009).
- *The Teaching Profession in Europe: Profile, trends and concerns. Report III: Working conditions and pay* (Eurydice, 2003).
- *Levels of Autonomy and Responsibilities of Teachers in Europe* (Eurydice, 2008).

The study on the teaching profession in Europe examined the position of teachers in full-time compulsory general secondary education in 30 European member countries. The data were collected by national units in the Eurydice network and by national experts. Questionnaires with definitions and instructions were used to guide the data collection. Most of the indicators were prepared using the UOE database. The data refer to 2000/01.

The seventh edition of the report entitled *Key Data on Education in Europe* encompasses 129 indicators in six subject-based chapters: Context, Structures, Participation, Resources, Educational Processes, and Graduates and Qualification Levels. The main data sources are the national units in the Eurydice network, the European statistical system (Eurostat), and the PISA/PIRLS databases (*i.e.* the PIRLS 2006 and PISA 2006 background questionnaires). The 2009 edition covers 30 European countries. The data refer to 2006/07.

Levels of Autonomy and Responsibilities of Teachers in Europe covers school education at primary and

lower secondary level. All Eurydice network countries except Turkey are covered. The comparative analysis is based on responses to the guide to content by Eurydice national units. The data refer to 2006/07.

Finally, descriptive information is also available in Eurybase, the database on the education system in EU, acceding and EEA countries which is updated annually. In these national reports a chapter is devoted to teachers (including sections on initial training and professional development of teachers). In the Eurydice reports, a distinction is usually made between teachers in pre-university education and teachers in tertiary education. The chapters are prepared according to a common framework; the content varies from country to country.

Amount, types and impact of professional development

Status of continuing professional development

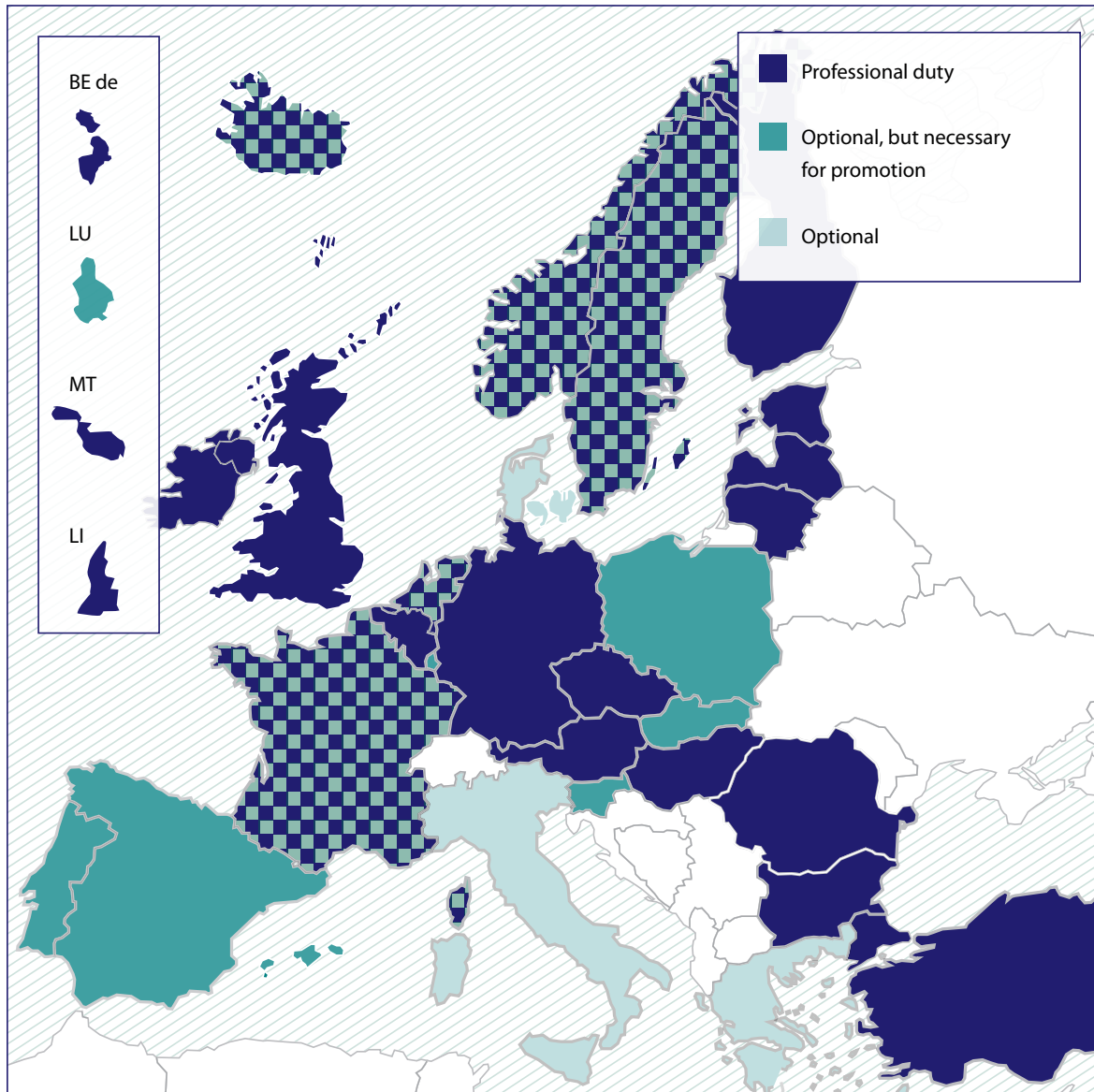
Professional development is considered a professional duty for teachers in many European countries and regions (Eurydice, 2003, 2008; European Commission, 2009). Yet, teachers are not explicitly obliged to engage in professional development activities in all countries and regions (Figure 3.1). For example, while continuous professional development is a professional duty in France, Iceland, the Netherlands and Sweden, participation in it is in practice optional (European Commission, 2009; Eurydice, 2008).

In Luxembourg, Poland, Portugal, Slovakia, Slovenia and Spain, continuous professional development is optional, but clearly linked to career advancement and salary increases. In Luxembourg and Spain, teachers who enrol for a certain amount of training are eligible for a salary bonus. In the other four countries, credits may be acquired via participation in continuous professional development programmes and are taken into account for purposes of promotion. In Cyprus, Greece and Italy, continuous professional development is a definite obligation for newly appointed teachers (Eurydice, 2008; European Commission, 2009).

Specific continuous professional development linked to the introduction of new educational reforms and organised by the relevant authorities

is in general a professional duty for teachers in all countries (Eurydice, 2008; European Commission, 2009).

Figure 3.1. Status of continuing professional development for teachers in primary and general (lower and upper) secondary education (ISCED 1, 2, 3), 2006/07



Source: Eurydice (published in *Key Data* 2009).

Additional note:

Luxembourg: Since 2007, continuous professional development has been compulsory for teachers in secondary education.

Explanatory note:

Professional duty: Task described as such in working regulations/contracts/legislation or other regulations on the teaching profession.

Requirements in terms of time

Over half of the countries that participated in the OECD study have no minimum requirement for teachers' participation in professional development. In countries that have set minimum requirements [Australia (some states), Austria, Belgium (French Community), Finland, Hungary, the Netherlands, Scotland, Sweden, Switzerland and the United States (some states)] the requirement is commonly five days a year. The range is from 15 hours a year (Austria) to 104 hours in Sweden.

The OECD and EU reports give no information on the time teachers actually spent on professional development.

Induction: support measures for new teachers

In the OECD study ten countries reported having mandatory induction programmes for new teachers: Australia (some states), England, Northern Ireland and Wales, France, Greece, Israel, Italy, Japan, Korea and Switzerland. In Scotland, participation in induction is at the discretion of individual teachers. In Canada (Quebec), Denmark, the Netherlands and Sweden induction is offered at the discretion of the school. Eight countries offer no formal induction programmes (OECD, 2005).

In most countries, the school of the new teacher is in charge of providing induction. In Israel, Japan, Northern Ireland and Switzerland teacher induction is organised in collaboration between teacher education institutions and schools. The duration of induction programmes ranges from seven (Korea) or eight (Greece) months to up to two years in Quebec, Switzerland and parts of the United States. Mentor teachers, often in cooperation with school management, are in charge of providing teacher induction (OECD, 2005).

In the majority of OECD countries with mandatory induction programmes, the successful completion of a teacher induction programme is a prerequisite for full certification. Only Australia (some states), Japan and Korea have mandatory induction programmes that are not linked with teacher certification (OECD, 2005).

The OECD and EU reports give no information on the impact, or experienced impact, of professional development activities on the functioning of teachers.

The support teachers receive for professional development

In many countries teachers can obtain a leave of absence and/or a research grant to undertake study or research activities (OECD, 2005).

Professional development in many European countries may be organised during work hours; substitute teachers replace teachers who are absent (Eurydice, 2003). In Belgium, the Czech Republic, Finland, Italy, Lithuania, Luxembourg, Portugal, Romania, Slovenia and the United Kingdom teachers have the right to use a certain amount of paid working time for professional development activities (Eurydice, 2008).

In the **Czech Republic**, teachers are entitled to 12 working days in a school year for independent study.

In **Italy**, in accordance with the freedom to alter the school timetable flexibly, some schools suspend classes for a few days to carry out intensive training initiatives. The employment contract also states that teachers are entitled to exemption from their normal duties for five days in the school year in order to attend training.

In **Lithuania**, the law states that teachers are entitled to five days of professional development training a year, for which they are remunerated in accordance with their average daily salary. The situation is similar in **Slovenia**. In **Finland**, three to five days are set aside for continuous professional development.

In the **United Kingdom (England, Wales and Northern Ireland)**, the statutory conditions of service require teachers to be available for work under the direction of the head teacher for 195 days a year, of which only 190 are teaching days. The five days when school sessions are not required were introduced to support a number of non-teaching activities, including professional development.

In **Romania**, the “methodological day” (several hours or one whole day per school week) provides for the organisation of continuing professional development in addition to other activities. Similar arrangements exist in **Belgium** and **Luxembourg**.

Teachers in **Portugal** are authorised to have professional development training during their working time, but for no longer than 10 hours a year when it is on their own initiative. Otherwise their annual leave cannot exceed 5 to 8 days.

This does not imply that most professional development provision occurs during working hours. On the contrary, professional development activities are generally organised outside working hours (Eurydice, 2008). A lack of substitute teachers and the cost of providing substitute teachers discourage teachers from participation in professional development activities during working hours (Eurydice, 2003, 2008).

Other types of support available for teachers include payment of training-related expenditure

and payment of enrolment costs of training. Training-related expenditure covers both enrolment costs and other costs such as travel costs and is paid in most EU countries where professional development is compulsory (Eurydice, 2003).

In the OECD study (OECD, 2005), it is mentioned that teachers frequently make a financial contribution to the costs of transport, course fees or course materials in recognised professional development programmes. The major exceptions are Chile, Northern Ireland and Sweden where teachers generally do not contribute to such costs.

Measures to encourage teacher participation in continuous professional development

To encourage teachers to participate in professional development countries may offer incentives such as salary increases or credits for promotion. Specific campaigns or strategic policies may also focus on raising their participation.

Figure 3.2. Incentives for participation by teachers in continuing professional development, ISCED 1 and 2, 2006/07

	BE fr	BE de	BE nl	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT	LU
Salary increases				●	●												
Promotions		●		●													
Campaigns/strategic policies																	

	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK-ENG/WLS/NIR	UK-SCT	IS	LI	NO
Salary increases																
Promotions																
Campaigns/strategic policies											●	●				●

● Incentives exist

Additional notes:

Czech Republic: The information shown refers to salary allowances, not increases in the strict sense.

Cyprus: University degrees involving at least one year of study lead to extra credits for promotion.

Luxembourg: Salary increases only concern teachers at ISCED Level 1.

United Kingdom (SCT): The salary increase incentive only applies if continuous professional development is part of a wider development programme, such as one leading to chartered teacher status, when the teacher has succeeded in achieving this status.

Norway: Continuing professional development courses provided by higher education institutions can lead to extra study credits. In some cases this may result in a higher salary for teachers. However, most continuous professional development courses do not award such credits or lead to higher positions or salaries.

Explanatory note:

Salary increases linked exclusively to the acquisition of master's degrees or doctorates are not taken into account.

Source: *Levels of Autonomy and Responsibilities of Teachers in Europe*, Eurydice, 2008.

In about one-quarter of the countries participating in the OECD study, completion of professional activities is required for teacher promotion or recertification: for promotion in England and Wales, Korea, Northern Ireland, Switzerland and the United States, and for recertification in Israel and the United States (OECD, 2005).

Only in a few countries does participation in continuous professional development activities result in a salary increase (Figure 3.2).

In **Spain**, such an incentive consists of additional remuneration for civil service teaching staff after a minimum of five or six years of teaching (depending on the Autonomous Community concerned), provided they prove that they have taken a minimum number of hours of training in officially recognised activities. The minimum number of hours required ranges between 60 and 100. Teachers can obtain up to a maximum of five such increments throughout their professional career.

In **Hungary**, professional development activities are not linked to an increase but to normal advancement on the salary scale. Progression on the scale is conditional on successful completion of continuing professional development courses once every seven years.

In **Latvia**, professional development is to become one of the criteria used to establish teaching qualifications in accordance with the inclusion of teacher salaries in the unified system of public-sector salaries. The reform started in 2006 and will gradually move to the new system to 2010. Continuous professional development will be taken into account for advancement on the salary scale.

In addition, not all kinds of professional development activity may result in a salary increase. According to the teachers' wage contract in Iceland, only additional qualifications such as master's degrees and doctorates lead to higher salaries.

The situation is not significantly different in the case of promotion. Few countries offer promotion possi-

bilities linked to participation in continuous professional development activities (Eurydice, 2008).

In **Belgium (German-speaking community)**, regular participation in professional development training is one of the evaluation criteria that may result in the appraisal "good" or "very good" at the end of the evaluation report which has to be established regularly by the school head and is taken into account in the promotion of teachers.

In **Estonia**, a minimum of 160 hours of professional training is needed to secure the occupational grade of senior teacher and teacher-methodologist.

On successful completion of continuous professional development programmes in **Lithuania**, teachers may seek a higher qualification category. There are four such categories: "teacher", "senior teacher", "teacher-methodologist" and "expert teacher". Each is progressively linked to higher pay.

In **Austria**, teachers receive attendance certificates which may be significant if they apply for a more senior post (e.g. school head). Formal further training activities generally enhance their chances of permanent employment, since they result in the award of additional qualifications.

In Denmark, Norway, Sweden and the United Kingdom, government campaigns and strategic policies focus on investment in the continuous professional development of teachers (Eurydice, 2008).

With the campaign "A boost for teachers", the **Swedish** government encourages municipalities and individual teachers to take part in continuous professional development. From 2007 to 2010, the government is offering 30 000 fully qualified teachers (*i.e.* around 25 % of all primary and secondary school teachers) training to reinforce their knowledge of their subjects and enhance their teaching ability. The government spends SEK 2.9 billion on in-depth education. Another SEK 500 million is being earmarked for competence development to

achieve and increase in the number of teachers with doctorates.

In the **United Kingdom (England)**, the continuing professional development of the school workforce, including teachers, is a government priority. Under the Education Act 2005, the Teacher Training Agency (TTA) became the Training and Development Agency for Schools (TDA) with an additional role in the continuing professional development (CPD) of serving teachers. The provision of CPD across the country is complex, with responsibility and funding devolved to schools. The TDA aims to stimulate informed demand for CPD through revised performance management arrangements (implemented in 2007) and a new framework of professional standards (effective from the same year), and to bring coherence to CPD by providing leadership and guidance to schools and local authorities.

The **Norwegian** Ministry of Education and Research has allocated substantial resources for professional development to teachers and school

leaders in connection with the implementation of the "Knowledge Promotion" reform.

Not only are there few incentives to encourage teachers' participation in continuous professional development, but penalties for failure to participate appear to be uncommon. Only in Belgium (the German-speaking and Flemish Communities), Malta and Portugal may non-participation in continuous professional development activities be penalised or regarded as a negative element in the appraisal of teachers.

Planning of professional development programmes

The choice of continuing professional development programmes may depend on a training plan established to meet the educational priorities of central authorities in terms of teacher competences and skills. Training plans may also be developed at school or local level as part of school development plans. In the absence of a plan, the decision to follow development programmes may also be entirely up to the individual teacher (Eurydice, 2008).

Figure 3.3. Establishment of a training plan for the continuing professional development of teachers, ISCED Levels 1 and 2, 2006/07

	BE fr	BE de	BE nl	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
A	●○	●○	○	●○	○	○	●	○	○	●	●	●	●○	●	●○	●○
B	✓	✓	✓		✓											✓
	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	IS	LI	NO
A	○	○	●○	○	●	○	●○	●○	●○		●○	○	○	○	⊗	○
B			✓										✓	✓		
A	Level of responsibility		● At central level		○ At school or local level											
B	Compulsory inclusion in school development plan		✓ = Yes													
⊗ No explicit training plan																

Source: *Levels of Autonomy and Responsibilities of Teachers in Europe*, Eurydice, 2008.

In 12 countries, including Denmark, Norway and Sweden, training plans are established at school or local level (see Figure 3.3).

In **Norway**, for example, a strategy plan issued by the Ministry of Education and Research as preparation for the Knowledge Promotion Reform in 2006, defines the subjects and areas consid-

ered important to develop. This document is not binding on local authorities or schools. Each municipality is free to investigate its own local needs for enhancing teachers' competences and can formulate its own strategies. How this is carried out will vary at the local level, but continuous professional development plans must be accepted and decided on at municipal level.

In six countries, training is planned centrally in accordance with central (national or regional) education priorities. In the remaining countries, both levels (central and school or local) contribute to the establishment of training plans. In Liechtenstein and Slovakia, training plans do not exist.

In Belgium, the Czech Republic, Iceland, Lithuania, Malta and the United Kingdom, it is compulsory for schools to have a continuing professional development plan for their teachers as part of the school development plan.

It is hard to estimate the extent to which the continuous professional development needs of teachers are taken into account in these training plans.

In the **United Kingdom (Scotland)**, for example, there is an assessment of the individual needs of teachers but within the context of school, local and national priorities. There is frequently a very clear reference to the main aims of the school's development plan. For many staff, the review exercise has led to increased levels of self-awareness and a focus on both individual and school needs.

Independently of how training plans are established, teachers in all countries are free to choose from a training offer when they meet certain organisational preconditions (see section below on organisational aspects). In most countries, however, development plans may contain compulsory training modules which are generally linked to the introduction of curricular (or other) reforms, such as those concerned with new subjects or methodologies. Where this occurs, the topics clearly cannot be chosen. Compulsory training of this kind may also be organised under a school development plan, with the result that all teachers have to take part (Eurydice, 2008).

Budget for professional development

In some EU countries, the overall budget for continuous professional development is managed by the top-level education authority. This is the case in Bulgaria, France, Germany, Hungary, Ireland, Malta, Portugal and Spain. In Italy, the budget is

allocated to schools by the ministry, while in Romania the ministry allocates funding for professional development to the counties. In Estonia, funds are forwarded to local authorities on the basis of a so-called "teachers salary fund" (Eurydice, 2008).

In **Estonia**, at least 3 % of the salary fund of teachers receiving their salary from the state budget must be used for professional training. Local authorities may allocate additional funds for the professional training of teachers and determine the fields supported.

In Belgium, Bulgaria, Cyprus, Estonia, Finland, Hungary, Latvia, Liechtenstein, Portugal, Romania, Slovakia and Slovenia – many of which are new EU Member States – programmes organised by the ministry or any other official authority at regional/local level are free or almost free of charge.

In **Hungary**, the costs of participating in continuing professional development are covered by the central budget up to 80 % of the total. The remaining 20 % are covered by the school or the teacher. The Ministry of Education has determined standards for financing, and gives the funding to the local government authorities which maintain most schools and transfer the money to them.

In **Finland**, continuous professional development at the school where the teacher works is organised and financed by the education provider. Municipalities usually allocate EUR 200-220 per teacher annually for this kind of training, while government-funded professional development linked to national priorities is co-ordinated by the Finnish National Board of Education. The employer does not have an obligation to pay for the costs incurred in the travel, accommodation, salary and hiring of substitute teachers. For self-motivated continuing teacher education, the teacher may also get financial support in the form of a study grant.

In the Czech Republic and the Netherlands, the CPD budget is part of the lump sum provided for schools. The situation is similar in the United Kingdom. In Lithuania, the education system is based on

the “pupil’s basket” principle. A share of the funds in the “basket” may be used by schools for professional development courses (Eurydice, 2008).

Teachers’ perceived need for professional development

In the OECD and EU reports there is no information available on the type of professional development for which teachers perceive a need. An overview of topics offered in professional development is given in the study on the teaching in Europe (Eurydice, 2003). These topics include ICT, teaching methodology, management/school development, special needs, multicultural teaching and conflict/behaviour management. In more than half of the 30 countries, all or almost all of these topics are offered in professional development activities (Eurydice, 2003). Information on the main barriers to professional development is lacking in the both the OECD and the EU reports.

Summary

Comparable quantitative data on teachers’ professional development is scarce both at the national and international level. The OECD study contains some information on minimum legal requirements for teachers’ participation in professional development in terms of time. In countries that have set minimum requirements [Australia (some states), Austria, Belgium (French Community), Finland, Hungary, the Netherlands, Scotland, Sweden, Switzerland and the United States (some states)], the requirement is most commonly five days a year. It ranges from 15 hours a year (Austria) to 104 hours in Sweden (OECD, 2005).

The OECD (2005) study also contains information on countries that have mandatory induction programmes for new teachers: Australia (some states), England, Wales and Northern Ireland, France, Greece, Israel, Italy, Japan, Korea and Switzerland.

The EU and OECD studies give no data on the time teachers actually spent on professional development or on the perceived impact of professional development activities. They contain very general information on the support teachers receive for professional

development (*i.e.* possibilities to participate in professional development during working time). In Belgium, the Czech Republic, Finland, Italy, Lithuania, Luxembourg, Portugal, Romania, Slovenia and the United Kingdom, teachers have the right to use a certain amount of paid working time for professional development activities (Eurydice, 2008). However, owing to a lack of substitute teachers and the costs of providing for substitute teachers, teachers are often unable to participate in professional development activities during working hours.

In none of the studies mentioned is there information on teachers’ perceived professional development needs. With the exception of *Levels of Autonomy and Responsibilities of Teachers in Europe* (Eurydice, 2008) and *Key Data on Education in Europe 2009* (European Commission, 2009), the data are not very recent and need to be updated. Clearly, even in terms of a basic description of training and professional development of teachers in Europe, the TALIS survey can be seen as filling in “blanks” in the knowledge base.

3.3 The system-level context of teachers’ professional development

In educational effectiveness research there is a recent trend towards analysing effectiveness-enhancing conditions at the level of national education systems. Two major phenomena have been extensively studied: decentralisation and school autonomy on the one hand, and evaluation and accountability arrangements on the other. This section presents a brief summary of research outcomes in both areas before addressing the question of the implications of these system-level factors for issues such as teacher quality and the content and form of teachers’ professional development.

Overview of research on the effects of decentralisation and accountability

School autonomy and student achievement were studied from an international comparative point of view by Walberg *et al.* (2000) and Wößmann (2003). Walberg and his co-authors analysed effects of decentralisation policies in 14 countries. Despite

their overall negative conclusion about the effect of decentralisation, they did find that school autonomy had a significant positive effect on hiring staff. In his analysis of data from TIMSS 1995 and data from the OECD's (1998) *Locus of Decision-making* Wößmann concludes that enhanced school autonomy and educational decentralisation, in a system with central examinations, is likely to increase student achievement. He indicates that students in countries which have a central curriculum and centralised decision-making regarding approved textbooks score higher in mathematics and science than students in countries which do not. Moreover, students in schools that had primary responsibility for the hiring of teachers and the determination of teacher salaries performed better than students in schools with less discretion in these matters. By contrast, schools that are responsible for formulating the school budget showed lower mean student scores in mathematics and science than schools that lacked autonomy in this respect. Decentralising responsibility for the school budget to teachers is also related to lower student achievement. More responsibility for teachers only seems to be productive with regard to determining specific supplies to be purchased, and – as far as these are decentralised to individual teachers instead of teachers collectively – with regard to the school curriculum.

A more recent analysis using PISA data by Fuchs and Wößmann (2004) also reveals a positive effect for schools with primary responsibility for hiring teachers, especially for mathematics and – to a lesser degree – reading literacy. For determining teacher salaries, however, no significant effects were found for mathematics and science, and the effect for reading literacy was negative. Also, in contrast with the findings from TIMSS, schools with autonomy regarding the choice of textbooks show better mean student scores on all subjects than schools without discretion in this matter. However, the negative effects of autonomy on formulating the school budget, and the positive effects of autonomy on budget allocations within the schools, are in line with TIMSS findings. More importantly, their study reveals that the effects of autonomy are largely dependent on the existence of external exit examinations in the respective countries. Whereas school responsibility for determining course content is negatively

related to student achievement in countries without external exit exams, the relation is positive for countries which have them. Also, discretion regarding the choice of textbooks is only positively related to student performance in countries with external exit exams. Responsibility for hiring teachers, on the other hand, is negatively related to students' performance in mathematics and reading in these countries, whereas it has a positive impact on students' scores in countries without external exit exams.

In their study of school factors related to quality and equity, Luyten *et al.* (2005) report that students in schools with greater autonomy for personnel management tend to have higher mean reading literacy scores. However, as the authors note, this effect is reversed when reading literacy is controlled for the student composition of the school. In a subsequent analysis, Maslowski, Scheerens and Luyten (2007) argue that this is an intriguing finding, as only in countries such as Australia, Mexico and Spain does a strong relation exist between discretion in the personnel domain and school composition, while these countries' relative autonomy in this domain is far less than in many (other) Western countries. Moreover, school autonomy in the areas of resources, student policies and curriculum was not related to student scores. However, autonomy with regard to curriculum and student policies has a statistically significant, *negative* relation with two out of three literacy indicators (Luyten *et al.*, 2005). This provides (some) empirical support for the position that advocates stricter central regulations concerning curriculum and instruction.

Despite a few positive findings, the overview of the research literature on the direct and indirect effects of increased school autonomy on student performance sheds considerable doubt on the quality-enhancing impact of these policies. There have been some findings with regard to personnel management, mainly from international comparative studies, that indicate that schools' discretion in hiring staff may influence the quality of schooling. The findings so far, however, are inconclusive, as they point in different directions (see Maslowski, Scheerens and Luyten, 2007). A second observation that emerges is that a system of accountability accompanying the devolution of authority to schools is likely to have a positive effect

on the outcomes of schooling (Fuchs and Wößmann, 2004). Mons (2007) gives a further nuanced review of these and other research findings, not only with respect to quality but also with respect to the effect of decentralisation on equity.

There is less research-based evidence on the effectiveness of evaluation and accountability policies. Bishop (1997) shows, on the basis of TIMSS data, that countries that have standards-based examination systems perform better, on average, than countries that do not. Wößmann (2001) and Fuchs and Wößmann (2004) confirm the effect of examinations. Rand News Release (2000) attributes achievement gains among American states to the intensity of accountability systems. Carnoy, Elmore and Siskin (2003) draw a similar conclusion. School-effectiveness studies have emphasised the effects of monitoring student progress (e.g. Scheerens and Bosker, 1997; Willms and Somers, 2001; Scheerens, 2007). At the same time other authors draw attention to potential negative side effects of high-stakes testing and harsh accountability policies (e.g. Sacks, 1999, Cibulka and Derlin, 1995). Theoretically, the expected beneficial effects of evaluation and monitoring can be associated with systems theories regarding cybernetics, research findings with respect to school performance feedback (Kluger and DeNisi, 1996; Visscher and Coe, 2003), and concepts of organisational learning and reflective practitioners (Argyris and Schön, 1978).

Other relevant system-level conditions

This section describes other contextual conditions, mostly created at the national level, which are relevant to the functioning of teachers. Most are expected to have implications for training and continuous professional development.

The previous section considered decentralisation to the level of school autonomy. However, the degree to which teachers in autonomous schools are themselves autonomous may vary. The question of the extent to which teachers are involved in school decision making is a separate issue, often called teacher participation. Data are available from the OECD (2008) and the EU (Eurydice, 2008).

Economic and demographic societal developments also have an impact on education and lead to an increased set of responsibilities for schools and teachers. Examples are: integration of minority students, inclusive education where students with special needs are integrated in regular classrooms, compensatory programmes in disadvantaged areas, introduction of ICT, development of active citizenship and democratic values, educational programmes aimed at fighting obesity, use of alcohol and drugs etc. When such topics are electives, development of curricula and courses will often mean extra duty for the school's staff.

Working time is also an issue that is permanently under discussion and susceptible to changes in some countries. Examples of specific tasks required of teachers by legislation or other official documents and specified in employment contracts are: supervision after school hours, standing in for absent colleagues, and support to future teachers and new entrants (Eurydice, 2008, p. 41).

Job and working-time enlargement in the above sense will often be accompanied by changes in remuneration. There have been important changes in the salary system in quite a few countries during the last decade (OECD, 2008, Eurydice, 2008). Continuous professional development may or not be officially planned and lead to extra payment.

Legislation and formal regulation of continuous professional development varies among EU countries. In some it is obligatory, paid or supported by specific incentives; in others, it is not.

3.4 Conclusion: implications for teacher policies and the content and form of teachers' professional development

In the section on teacher effects, it was noted that overall teacher quality has an important impact on student achievement but that attempts to attribute this overall impact to specific teacher characteristics have only partly been successful. This can be seen as having implications for two types of teacher policies: hiring, recruitment and selection

on the one hand, and professional development on the other. In the first case teachers come in “ready-made”; and, on the assumption that principals know how to select good teachers, hiring decisions can be very beneficial for school performance. For the second, professional development and training will mostly address specific content and skills and therefore are likely to have more partial effects on overall school performance. The research finding that countries in which schools have autonomy in the hiring of teachers generally perform better could be seen as underlining the importance of teacher recruitment decisions.

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Teachers' professional development – a snapshot from talis of lower secondary education

4.1 Introduction

This chapter provides information on the participation of teachers in professional development activities, on the types of professional development undertaken by teachers, on the perceived impact of professional development and on unsatisfied demand. Support for professional development and mentoring and induction programmes are covered as well. This chapter covers the same ground as Chapter 3 of the first TALIS report (OECD, 2009) and is roughly structured in the same way.¹

The chapter contains additional analyses of the degree to which the key descriptive variables of professional development (participation, perceived impact and unsatisfied demand) are associated with teacher and school background variables. The section on participation in professional development explores the clustering of countries in terms of types of professional development. Next, a more in-depth analysis is made of the pattern of non-participation and the profiles of those who did not participate in any kind of professional development activity. Finally, the main results from the first TALIS report (OECD, 2009) are summarised, and professional development activities are related to other main areas of school functioning covered in the

¹ The presentation of results only highlights the major outcomes. As agreed with the contractor and with permission of the OECD part of the text of Chapter 3 of the OECD TALIS report is cited (sometimes abbreviated) to render the corresponding content.

survey: instruction, evaluation and feedback, and school leadership.²

4.2 Level of participation in professional development

Participation rates

Figure 4.1 and the first column of Table 4.2 show, at the country level, the comparative participation rates in professional development in the 18 months prior to the survey. On average across the 23 participating countries, 89% of teachers reported having undertaken some professional development (defined as having taken part in at least one day of development) over the period. This is a very high figure and provides a positive sign that, on average, engagement in professional development activities is a feature of the lives of the vast majority of teachers in the participating countries. However, this needs to be seen in the context of the rather broad

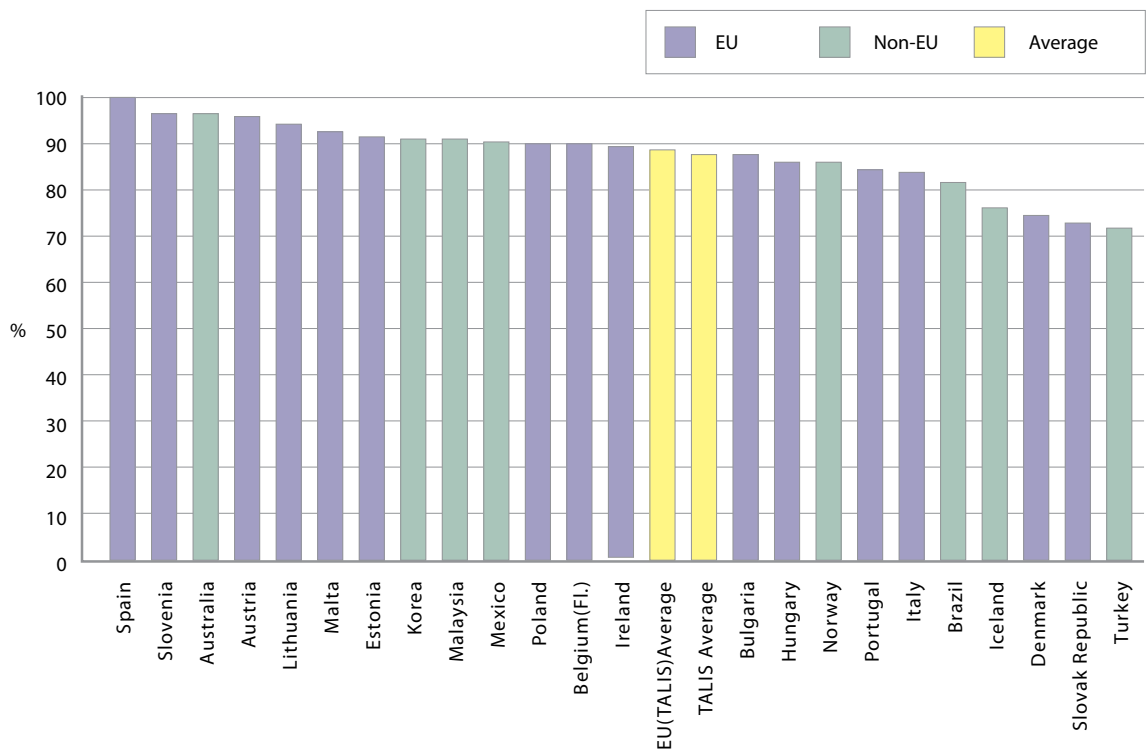
² In several places in this chapter it is indicated whether differences are statistically significant. This is only done for comparison of categories (e.g. school type or gender) and not for comparison of countries. This is because countries generally differ much more on various aspects than on categories within countries and because there are many more countries than categories, so statistical comparison of countries would require reporting enormous numbers of statistical differences. The precision of estimates is indicated by standard errors (SE) which are provided in almost all tables. An explanation of precision, standard errors and statistical significance of means is provided in Annex 4.A1 of this chapter.

definition of professional development activities used. In TALIS, professional development is defined as activities that develop an individual's skills, knowledge, expertise and other characteristics as

a teacher. Given this definition, the fact that some 11% of lower secondary teachers did not take part in any development activities in the period prior to the survey gives some cause for concern.

Figure 4.1 Percentage of teachers who undertook some professional development in the previous 18 months (2007-08)

Countries are ranked in descending order of percentage of teachers having had some professional development in the 18 month prior to the survey.



When participation rates are compared across countries, there are some notable differences. In Australia, Austria, Lithuania and Slovenia, participation is virtually universal: less than 5% of lower secondary teachers had not participated in development activities in the previous 18 months. In Spain all teachers reported having participated in

some development.³ This contrasts with the situation in Denmark, Iceland, the Slovak Republic and Turkey, where around one-quarter of teachers reported that they had not participated in professional development during this period. For these four countries, such relatively high rates of non-participation must be a source of some concern.

³ In Spain some 18% is missing on this variable, which is much higher than in other countries (< 10%, on average 7%). It seems that in Spain non-participation is coded as missing rather than zero days.

Profile of non-participants in professional development

The present section focuses on the profile of teachers who did not participate in professional development in the 18 months prior to the survey. The first column of Table 4.1 gives the percentages of non-participants; this is in fact the complement of the first column of Table 4.2. The other columns show non-participation rates based on teacher characteristics.

Gender differences

On average among participating countries the non-participation rate for male teachers is 14%, significantly higher than the 11% for female teachers. The largest differences are found in Estonia (16% for male, compared to 6% for female), Iceland (29% for male, compared to 20% for female) and the Slovak Republic (32% for male, compared to 24% for female). For the few countries in which non-participation is higher among females, only in Turkey is the difference noteworthy (22% for male, compared to 28% for female).

Age differences

On average among participating countries, teachers under 30 have the highest non-participation rate with 15%, followed by the teachers aged 50 and more with 12%, teachers aged 30-39 (11%) and finally the teachers aged 40-49 (10%). Differences between these categories are significant. This is more or less the general trend in most countries. The largest exceptions are in Korea, where teachers under 30 years have the lowest non-participation rate: only 4% compared with an average of 8% among all teachers. The highest non-participation rate among teachers aged 50 or more, compared to the other age categories in each country, is clearly in the Slovak Republic (34%), Poland (18%) and Korea (12%). In Denmark the non-participation rate is high for all age categories, but it is lower among teachers aged 50 or more (20%) than for the other age categories (25% and more).

Qualification level differences

The general trend in all participating countries with respect to differences in qualification levels is that teachers with a low qualification level participate relatively less in professional development than teachers with a high qualification level. The non-participation rate for all participating countries is 17% for teachers with qualification level 5B (polytechnic level) or below. This is significantly higher than the 12% for teachers with an ISCED level 5A (university level) bachelor degree and the 10% for teachers with an ISCED 5A master's degree or a higher level of qualification. Austria is the country that deviates the most from this general trend: the non-participation rate among teachers with a qualification at ISCED level 5B or below is less than 2%, or half the non-participation rate of all teachers in Austria. In contrast, the non-participation rate is 18% for teachers with an ISCED 5A bachelor's degree; however, this figure is not very reliable, because of the small proportion of teachers with this qualification level in Austria. There is also a reverse trend in Malta, where teachers with an ISCED level 5A master's degree or higher level of qualification have the highest non-participation rate: 10%, which is over 1.5 times higher than the non-participation rate among all teachers in Malta.

Differences between public and private schools

The overall difference in non-participation in professional development between teachers in public schools and teachers in private schools is not significant (Table 4.1a). In some countries the differences seem to be rather marked, but in most cases they are not significant because of the small proportions of teachers in private schools. Significant differences in non-participation rates are only found in Malta (with 11% in private and 4% in public schools), Ireland (with 13% in private and 8% in public schools), Turkey (with 16% in private and 25% in public schools) and Korea (with 12% in private and 8% in public schools).

School location differences

On average among all countries there are no significant differences in non-participation in professional development based on the size of the community in which the school is located (Table 4.1a). The fact that the average figures for teachers in large cities differ from those in other communities is mainly due to the fact that this category does not exist in 8 out of the 23 participating countries. On the country level, the only remarkable finding is in Austria, as teachers in schools in large cities show non-participation in professional development of 9%, almost three times as much as the overall figure for the country.

Teacher subject differences

It might be interesting to know more about the relation between non-participation in professional development and the subject a teacher teaches. However, 11 different subjects are involved and about half of the teachers teach more than one. When these numbers are related to the 11% of non-participating teachers, the results would be too unreliable for interpretation, so no further investigations were carried out on this issue.

Summary

In summary, those most likely not to have taken part in professional development are: young teachers, male teachers and teachers with a qualification at ISCED level 5B or below. No differences with respect to this non-participation were found for school characteristics.

4.3 Intensity of participation in professional development

While participation rates in general may be high, intensity of participation may differ among teachers and across countries. TALIS measures the intensity of participation in terms of the number of days of professional development that teachers reported to have taken in the 18 months prior to the survey.

On average among all lower secondary teachers in the participating countries, teachers undertook

15.3 days of professional development during the period, or an average of just under one day a month. For the EU countries the average was 14.6, but countries varied significantly. In EU countries the highest average number of days was reported by lower secondary teachers in Bulgaria, Italy, Poland and Spain (26-27 days) and the lowest by teachers in Ireland (5.6 days), the Slovak Republic (7.2 days), Malta (7.3 days), Belgium (Fl.) (8.0 days) and Slovenia (8.3 days). Among EU countries, therefore, there is a five-fold difference between the highest and lowest intensity of participation (Table 4.2; see also Figure 4.7). Non-EU countries such as Mexico (34.0 days), and Korea (30.0) had even higher averages.

How participation varies by teacher and school characteristics

The disparity in the take-up of professional development can be more closely focused by contrasting participation according to the characteristics of the teacher and the schools in which they work. The figures shown in Tables 4.2a and 4.2b and discussed here are based on the average days of development among teachers who undertook some professional development in the 18 months prior to the survey. They do not include teachers who undertook no professional development during this period.

The teacher and school characteristics chosen for comparison are those which are generally of most policy interest to the participating countries.

Gender differences

On average across participating countries, female teachers took part in very slightly more professional development than their male counterparts (17.5 days on average compared with 16.9 days). This difference is not statistically significant. The largest differences in favour of female teachers were in Mexico (around 6 days more on average), Poland and Korea (around 4 days more). Only for Korea is this difference statistically significant. However, male teachers undertook more days than female teachers in 9 of the 23 countries, the largest differences being reported in Portugal and Italy (more than 4 days) and Turkey (almost 3 days). These differences are not statistically significant (Table 4.2a).

Age differences

On average among participating countries, the amount of professional development that teachers received decreased with age. Averaged across EU countries, teachers under the age of 30 received around 21 days of professional development. This figure declined steadily to an average of around 14 days for teachers aged 50 or more. This is consistent with a similar comparison based on the numbers of years of teachers' experience, which indicates that, on average, less experienced teachers received more days of development than more experienced teachers. All differences between the age groups are statistically significant.

In some countries, lower secondary teachers remain active in professional development throughout their career. In Bulgaria, for example, teachers in each age group had taken part in well over 25 days of professional development in the previous 18 months; in fact among those aged 50 and over, the number of days of professional development was 27, as high as among the youngest age group in that country.

Qualification level differences

On average across the participating countries, teachers with a master's degree or higher qualification received more days of professional development (some 20 days in the 18 months prior to the survey) than those with a bachelor's degree or less (17-18 days). This trend is evident in almost all participating EU countries, the exceptions being Austria, Belgium (Fl.), Hungary and the Slovak Republic, where teachers with a master's degree or higher received the least number of days on average. The difference between teachers with a master's degree or higher qualification and the two categories with a lower qualification level is statistically significant.

In a number of countries, the least qualified (*i.e.* those with qualifications below the level of a bachelor's degree) received the least amount of development. On face value this is a worrying finding, given that those who might arguably benefit most from further professional development are getting the least. It may therefore raise questions of equity, particularly if such teachers are disproportionately employed in more challenging schools, as previous research has shown.

Differences between public and private schools

As defined here, private schools comprise both independent private and government-dependent private schools (the latter are privately run but receive most of their funding from public sources). On average across participating countries, teachers in public schools had one day more of professional development than their private school counterparts over the survey period; this is not statistically significant. Except in Bulgaria, where the proportion of teachers in the private sector is very small, the largest difference in favour of public school teachers was in Korea (9 days more). Among EU countries the largest difference was found in Belgium (Fl.) (5 days more). Though there were also sizeable differences in favour of private school teachers, none of these is statistically significant (Table 4.2b).

School location differences

On average among participating countries, the amount of professional development undertaken by lower secondary teachers is much the same, regardless of whether their schools are located in a village, town or city. And although the pattern varies within countries there is no prevailing trend. In no country, for instance, does the amount of professional development consistently increase or decrease according to the size of the population of the location in which the school is situated (Table 4.2b). The fact that the TALIS average for teachers in schools in a large city is higher than for other categories is due to the fact that this category does not exist in 8 of the 23 countries. In conclusion, none of the differences between categories is significant.

Whereas in Belgium (Fl.) teachers in village schools (fewer than 3 000 population) took part in significantly more professional development activities than their counterparts in other types of communities [16 days compared with 9 for Belgium (Fl.) as a whole], the reverse was true in Bulgaria, Mexico and Poland. Particularly in Italy and Poland, teachers teaching in the largest communities were much more likely to have undertaken a greater amount of professional development than their counterparts in smaller communities.

Differences in teachers' subjects

Another aspect of a teachers' job concerns the subject taught. A problem for analysing the data by teachers' subject is that many teachers teach more than one subject. Specifically, EU teachers teach on average 1.8 subjects out of the list of 11 subjects covered (including a general category "other"), with a minimum of 1.4 in Bulgaria and Poland and a maximum of 2.5 in Austria and 2.8 in Denmark. On average 54% of teachers teach just one subject, with a minimum of 18% in Denmark and 23% in Austria and a maximum of 74% in Estonia and 73% in Poland.

The average number of days of professional development varies in the main subject matter areas: reading, writing and literature, mathematics, and science (Table 4.2c). When looking only at teachers who teach one subject, the number of days of professional development is significantly higher for teachers in reading, writing and literature than for mathematics and science teachers. For mathematics and science teachers there is hardly any difference. Countries differ, however: in Brazil and Portugal, the number of days of professional development is highest for science teachers. Within countries, no significant differences are found.

When looking at all teachers teaching a specific subject, including those who may also teach one or more other subjects, the differences among subjects vanish. What is more, in most cases the average number of days of professional development is higher than for the subgroup of teachers who only teach one subject, especially mathematics or science. Thus, teachers who teach more than one subject take more days of professional development on average than teachers who only teach one.

4.4 Types of professional development undertaken

Analysis of the types of development activities undertaken can be informative about the variety of teacher's development activities. It can also go some way towards explaining differences in the average number of days of professional development that teachers take within countries. TALIS asked teachers about a wide range of activities, from more organised and structured to more informal and self-directed learning.

The most common type of professional development across countries was "informal dialogue to improve teaching", with on average 93% of teachers reporting to have engaged in this in the 18 months prior to the survey. Indeed in all but Hungary (79%) and Mexico (89%), it was teachers' most frequently reported development activity, with more than 90% participating in each country. For Hungary, the highest reported participation was in "reading professional literature" (88%) and for Mexico it was attendance at "courses and workshops" (94%) (Table 4.3 and Figure 4.2).

After "informal dialogue to improve teaching", the next most frequently reported activity on average across the 23 countries, was attending "courses and workshops" (81%) and "reading professional literature" (78%); the least common activities were "qualification programmes" (25%) and "observation visits to other schools" (28%) (Table 4.2).

But patterns vary greatly between countries, particularly in the more structured types of activities. For instance:

- *Courses and workshops.* Participation in this activity was most common in Austria (92%), Estonia (93%), Lithuania (96%) and Mexico (94%) and much less common in Italy (66%), Turkey (62%) and particularly the Slovak Republic (50%).
- *Education conferences and seminars.* Over two-thirds of teachers participated in this activity in Lithuania (68%), Slovenia (75%) and Turkey (68%), but participation was less than half these rates in Belgium (Fl.) (33%), Malaysia (32%) and Mexico (33%).
- *Qualification programmes.* Participation in these programmes was most common in Brazil (41%), Bulgaria (50%) and Lithuania (44%) and least common in Australia (12%), Ireland (11%), Italy (11%) and Slovenia (10%).
- *Observation visits to other schools.* Around two-thirds of teachers in Estonia (63%), Iceland (60%) and Korea (67%) took part in such visits but only 10% or less in Austria (10%), Denmark (10%), Ireland (8%) and Slovenia (8%).

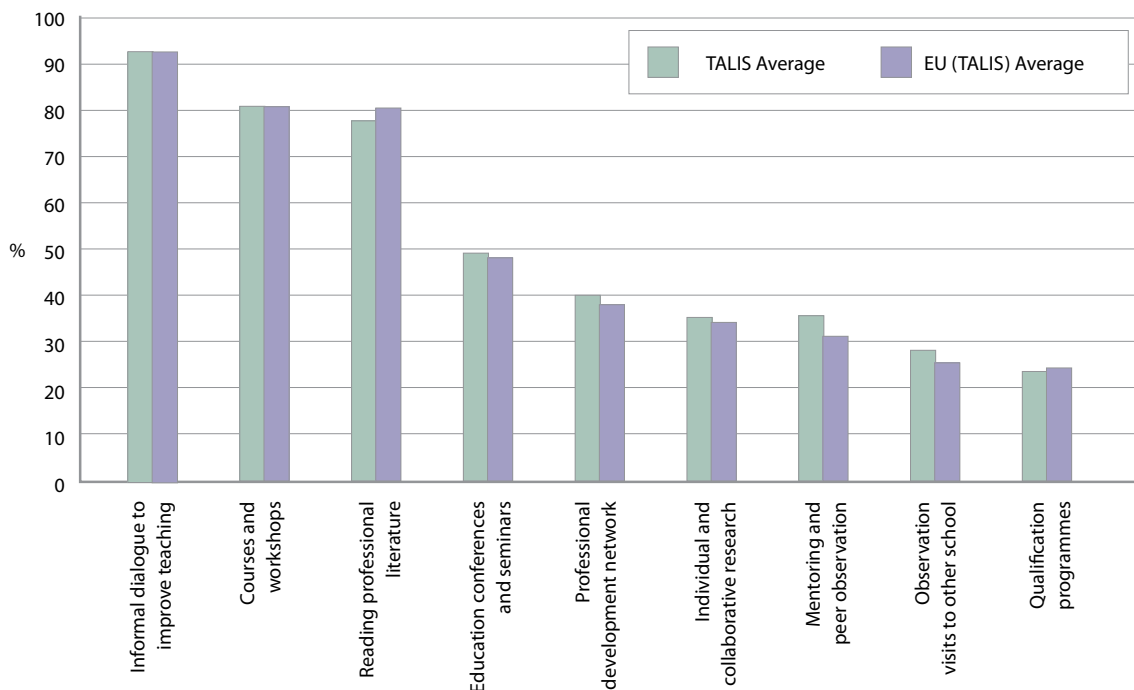
- *Professional development network*, Participation in development networks was most common in Australia (60%) and Poland (61%) and particularly in Iceland (83%) and Slovenia (72%). In contrast, this was much less a feature of teachers' professional development in Bulgaria (20%), Italy (20%) and especially Portugal (15%).
- *Individual and collaborative research*. More than half of teachers engaged in this activity in Brazil (55%), Italy (57%) and Mexico (63%), but many fewer in Norway (12%) and the Slovak Republic (12%).
- *Mentoring and peer observation*. Around two-thirds of teachers took part in such activities in Korea (69%), Poland (67%) and the Slovak Republic (65%), but less than one-fifth in Austria (18%), Denmark (18%), Ireland (18%), Malta (17%) and Portugal (15%).

of the nine development activities and “mentoring and peer observation” featured strongly. These high rates partly result from the fact that individual teachers took part in a wider combination of development activities than in other countries; analysis of the international database shows that in both countries, teachers undertook on average between five and six types of activities out of nine, more than in any of the other countries. The relatively high levels of participation across a broad range of activities seem to indicate a well-developed and active professional development culture. The fact that the percentage of teachers wanting more development than they received is below average in both of these countries lends some support to this conclusion.

On the other hand, participation was below average in Norway on eight out of the nine types of activities, the exception being participation in “informal dialogue to improve teaching”, which was above average. Again, this was partly influenced by the number of different types of teachers' development activities. On average, they undertook only three or four different types of activities in the 18 months prior to the survey, the lowest number in the surveyed countries, followed by Ireland and Italy.

Examining the overall levels of participation in these activities, it is evident that participation rates are fairly consistently high across most types of activities in some countries but not in others. In Lithuania and Poland participation rates are higher than average for eight out

Figure 4.2 Participation rates for type of professional development activity (2007-08)



4.5 Categorising countries with respect to types of professional development

It is of interest to explore whether groups of countries give similar priority to specific types of professional development. A cluster analysis was therefore carried out and correlations between specific types of professional development were analysed.

By performing a cluster analysis on countries' average participation in the nine types of professional development, mentioned in section 4.4, countries are grouped in terms of similarities in the patterns of participation. In fact, they are grouped on the basis of similarities in the country's percentages of participation in each of the nine types of professional development undertaken. These percentages are reported in Table 4.3.⁴

The cluster process for the TALIS countries is shown in Fig 4.3. From left to right clusters are formed by bracketing single countries or clusters. At the end (right side) all countries are grouped into one cluster, but the most meaningful level of clustering is a matter of interpretation. The cluster process starts from the left by grouping the two countries with the highest degree of similarity [Belgium (Fl.) and Spain]. Moving from left to right, clusters of western European countries are formed first and only further to the right do other countries start to cluster. One cluster (shown in bold) mainly covers western European countries (except Iceland and including Malaysia). Clusters including more than two countries outside western Europe only form later in the process. This means that similarities are greater among western European countries than among other countries.

As indicated at the beginning of this section, the cluster analysis is based on average participation in nine types of professional development. The difference between western European countries and other countries participating in TALIS is clearest for participation in "mentoring and peer observations".

All western European countries except Iceland have a participation rate below 28%; the rate is higher for all other countries. Almost the same pattern is shown for "observational visits to other schools", with a cut-off at 19.5%; Portugal as well as Slovenia are exceptions. A similar pattern also occurs for "reading professional literature", with a cut-off at 80%; the exceptions are Austria as well as Korea, Malaysia and Mexico. For participation in "qualification programmes", with a cut-off at 20%, the exceptions are Portugal as well as Australia, Iceland, Slovenia and Turkey.

The situation for the other five types of professional development is less clearly defined, although participation in western European countries tends to be lower on average than in other countries for "professional development network" and "educational conferences and seminars".

It is also possible to look at the relations among the nine types of professional development. Table 4.3a shows correlations on percentages of participation in professional development by country, both for all TALIS countries and for EU countries only. The correlations among the four types of professional development that most distinguish western European and other countries are on average substantially higher than other correlations. This is especially true for the correlations in Table 4.3a that are based on EU countries only and range from 0.38 to 0.69. The common characteristic of these four types is individual participation in professional development. As pointed out above, participation in these types of professional development is much lower in western European than in other countries.

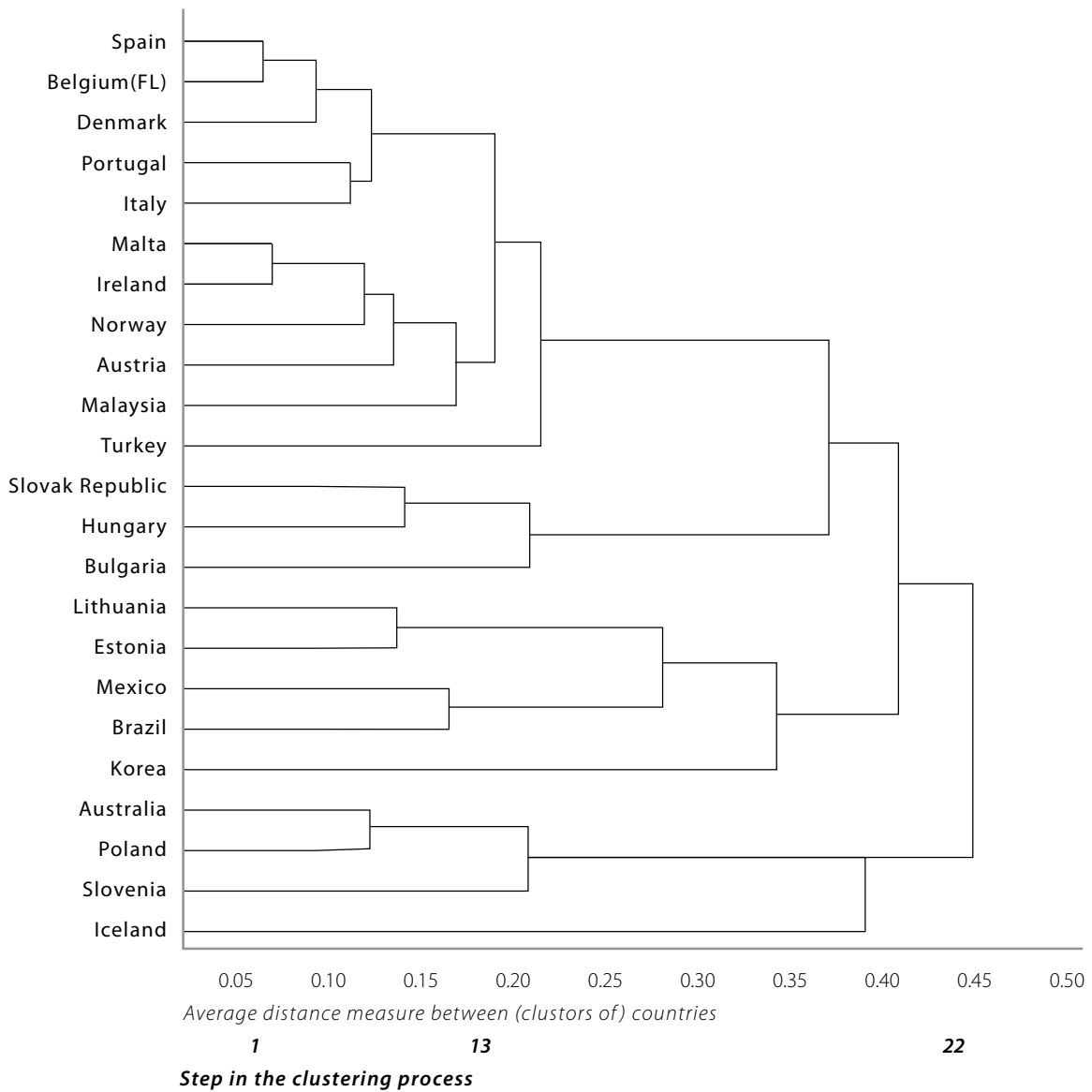
The two types for which the difference between western European and other countries is less pronounced ("professional development network" and "educational conferences and seminars") also show high correlations (0.42 for all countries; 0.61 for EU countries), although participation tends to be lower in western than in eastern Europe. They can be characterised as networking/ participation in groups.

For the three remaining types the correlations are much lower or non-existent.

⁴ The cluster analysis methodology used is described in Annex 4.A1.

Figure 4.3 Clustering of countries based on participation on nine types of professional development activities under teachers in the previous 18 months (2007-08)

Clustering for ALL TALIS countries



Source: OECD, Talis Database

4.6 Unsatisfied demand and development needs

The question of how well teachers' development needs are being met is considered with two indicators: the percentage of teachers who reported that they wanted more professional development than they had received in the 18 months prior to the survey and the extent to which teachers reported that they had development needs in specified areas of their work as teachers.

Teachers were asked whether they had wanted to participate in more professional development than they had. The first column of Table 4.4 summarises teachers' responses to this question. More than half of the teachers surveyed reported that they wanted more professional development than they actually received during the 18 months prior to the survey. The extent of unmet demand is sizeable in every country, ranging from 30% in Belgium (Fl.) to 76% in Portugal and over 80% in Brazil, Malaysia and Mexico.

Table 4.4 also shows the extent of unsatisfied demand according to a range of teacher and school characteristics. In almost all countries female teachers were more likely than male teachers to report wanting more development than they received, though the differences are generally not large. They are significant however for Australia, Austria, Brazil, Iceland, Italy, Korea, Norway, Portugal, Spain, and all TALIS countries together. There is a similarly consistent pattern for teachers under 40 years of age; in most countries they were more likely than older teachers to report a desire for more participation. In this respect, the differences are significant for Australia, Austria, Belgium (Fl.), Korea, Malaysia, Poland, the Slovak Republic, Slovenia, Spain, Turkey and all TALIS countries together.

There is no consistent cross-country pattern in terms of teachers' qualifications. Although in several countries more highly qualified teachers were more likely to have reported unsatisfied demand (particularly in Australia, Austria, Denmark, Malaysia, Spain and Turkey, where significant differences are evident), most countries show no definite pattern.

Similarly, a comparison of teachers in public and private schools does not reveal a consistent pattern. Considering significant differences only, teachers in Korea, Lithuania, Portugal and Turkey are more likely than their counterparts in private schools to report unsatisfied demand, whereas the reverse is true in Austria and Malta.

Table 4.11a shows the percentages of unsatisfied demand among teachers who reported that they did not participate at all in professional development. Figure 4.4 compares unsatisfied demand for all teachers (see also Table 4.11) with unsatisfied demand for non-participating teachers. Averaged over all TALIS countries the percentage of unsatisfied demand for non-participating teachers is about 2 percentage points lower than for all teachers. Statistically significant differences are found in Brazil (a difference of 6 percentage points), Korea (16), Lithuania (11), Poland (16), Malaysia (13), Mexico (8) and the Slovak Republic (6). On the other hand, statistically significant differences in the reverse direction were found in Australia (a difference of 14 percentage points), Italy (6), and Norway (7). In Malta the difference is about 10 percentage points, but because of the low proportion of non-participants, this is not statistically significant.

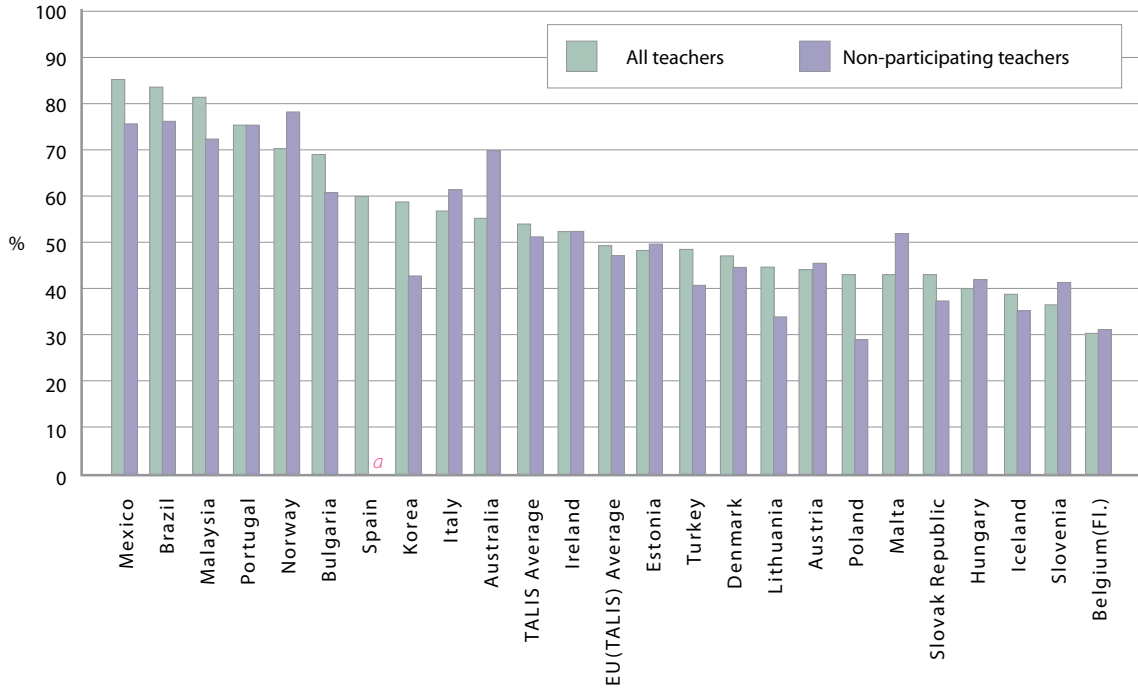
What are the areas of greatest development need?

Teachers were asked to rate on a four-point scale from "low level of need" to "high level of need" their development need in various aspects of their work. Table 4.5 presents the percentage of teachers reporting a high level of need in each aspect of their work. Figure 4.5 shows the averages across the 23 participating countries and the range of values for each aspect.

The aspect of teachers' work that was on average most frequently rated by teachers as an area of high development need across the 23 participating countries was "teaching special learning needs students". Almost one-third of teachers rated their development need in this area as high.

Figure 4.4 Percentage of teachers who wanted more professional development than they received in the previous 18 months (2007-08)

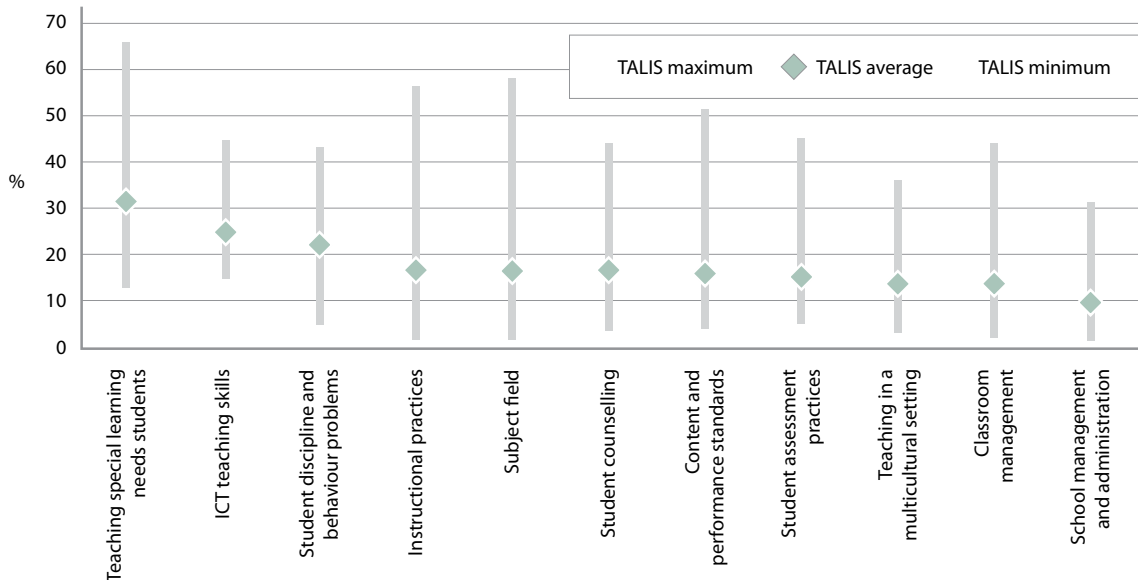
All teachers compared with teachers who did not participate in professional development



Countries are sorted on percentages of all teacher

Figure 4.5 Areas of greatest development need of teachers (2007-08)

TALIS-Average and range of percentage of teachers reporting a high level of need



Given that the TALIS target population excludes teachers who only teach special learning needs students, this finding is quite significant. It is probably a reflection of two current trends in educational policy. One is the integration of students with special learning needs in mainstream schools (inclusive education) and the other the growing emphasis on equity. The data send the important message that teachers do not feel fully prepared to cope with these challenges.

Other aspects of teachers' work in which on average sizeable proportions of teachers reported having a high level of development need were "ICT teaching skills" (25% of teachers) and "student discipline and behaviour" (21% of teachers).

In contrast, the aspect of teachers' work that on average was least frequently reported as a high development need, was "school management and administration" (10% of teachers across all countries, 8% in the EU) (Table 4.5).

However, patterns across countries differ sharply. It is striking, for instance, that in Malaysia the extent to which teachers report a high level of development need is, in certain areas, much higher than the average across countries. This is most evident for "content and performance standards" (34 percentage points higher than the country average), "subject field" (40) and "instructional practice" (38).

In Malaysia, not only did the vast majority of teachers want more professional development than they received (83%, much higher than almost all other countries, see Table 4.4) but the strength of that need across almost all areas of their work is much greater than in other countries in the survey (Table 4.5). Interestingly, the only aspect for which Malaysian teachers reported below average development need is "teaching special learning needs students", the area which is rated most frequently overall as a high level need across countries.

A similar though much less marked trend is apparent in Italy and Lithuania. Lithuanian teachers reported a higher than average degree of development need in most aspects of their work except "teaching special learning needs students" and "teaching in a multicultural setting". However, the

percentage of teachers who wanted more professional development than they received (45%) was slightly below the average across countries. In Italy the extent of teachers' need is above average in all areas of their work except "school management and administration".

Conversely, in Australia, high development need is below the country average in all eleven areas, and most notably in "teaching special learning needs students" (16 percentage points below the country average), "student discipline and behaviour" (15) and "instructional practices" (13).

Professional development need by subject

As noted in section 4.3, many teachers teach more than one subject. When comparing the percentages of teachers teaching a single subject who wanted more professional development than they received in the previous 18 months, the picture is rather diverse (Table 4.4a). Overall, for all participating countries, 47% of mathematics teachers feel the need for more professional development, significantly below the 52% for science teachers and 54% for teachers in reading, writing and literature. In Australia, Estonia and Portugal the need for more professional development is also significantly lower for mathematics teachers than for teachers in the other two subjects. In Lithuania the need for more professional development is significantly lower for mathematics teachers than for teachers in reading, writing and literature. In some countries the differences are much greater. In Denmark the need for more professional development is 51% for science teachers and 21% for teachers in reading, writing and literature. In contrast to the general trend, in Hungary and the Slovak Republic the stated need for more professional development is greater (though not significantly so) for mathematics teachers than for teachers in other subjects.

For the larger groups of teachers who teach a specific subject but who may also teach other subjects, the pattern is the same as that for the amount of professional development in section 4.3. The differences among subjects vanish, but in most cases the need for more professional development is greater for teachers who teach more than one subject than for those who teach only one.

Overall index of professional development need

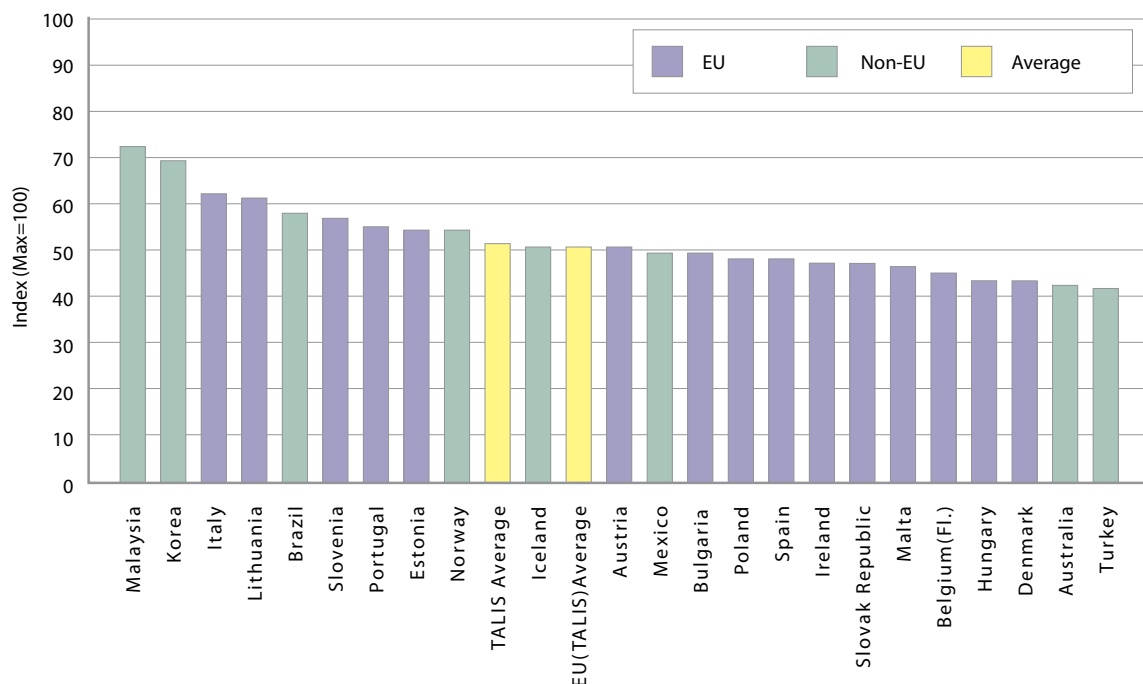
An index of overall need was compiled by assigning a score to each teacher according to the level of need reported for each of the eleven aspects of their work: 3 points for a high level of need; 2 points for a moderate level of need, 1 point for a low level of need and zero for no development need. These were then aggregated and divided by the maximum possible score of 33 (3 times 11) to give an overall percentage of the maximum “need” for each teacher. The index shown in Table 4.5 and Figure 4.6 is the average of this score across all teachers within a country. Thus, an index score of one would indicate that teachers reported a high level of need in each of the eleven areas of their work shown in Table 4.5. The table indicates that the greatest degree of need for development when aggregated across these areas was reported by teachers in Italy and Lithuania. The lowest level of need measured by this index was reported by teachers in Denmark and Hungary.

Probably the best way to compare the areas with a high level of need is to compare the country patterns with the overall pattern. This comparison shows the following notably high levels of development need:

- Content and performance standards: Bulgaria, Lithuania and Malaysia
- Student assessment practices: Lithuania and Norway
- Subject field: Italy, Korea, Lithuania and Malaysia
- Instructional practices: Italy, Korea, Lithuania and Malaysia
- Student discipline and behaviour problems: Austria, Hungary and Slovenia
- Teaching in a multicultural setting: Ireland
- Student counselling: Ireland, Korea and Poland.

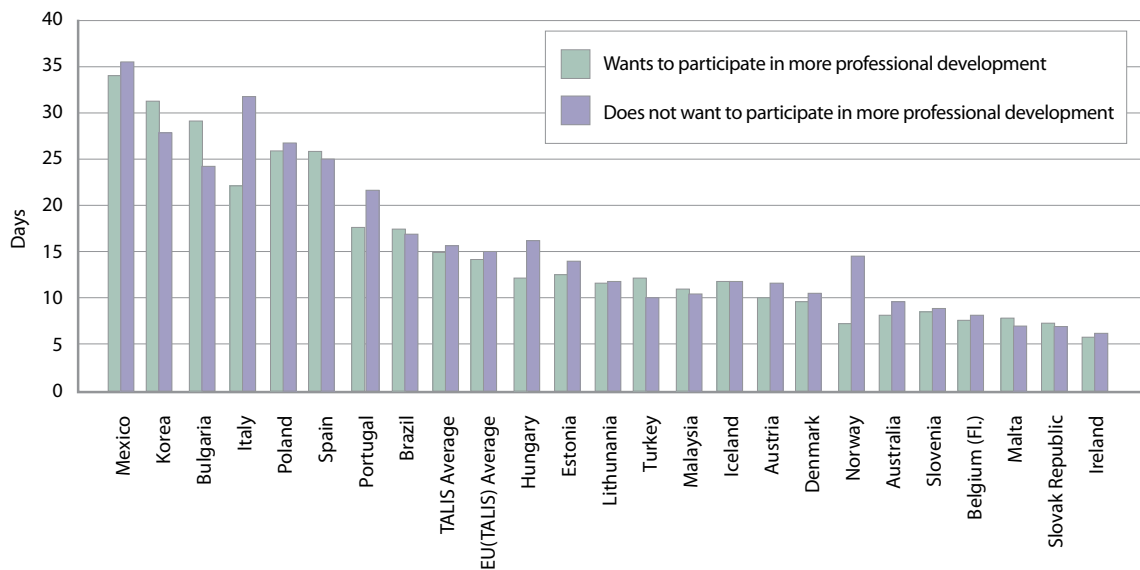
Figure 4.6 Index of professional development need (2007-08)

Scored across 11 aspects of teacher's work



Countries are ranked in descending order of index of professional development need

Figure 4.7 Amount of professional development undertaken by teachers in 18 months (2007-08)



Countries are ranked in descending order of days for all teachers

What is the relationship between participation patterns and unmet demand?

In 8 out of the 23 countries the teachers who indicated that they wanted more professional development than they received undertook significantly fewer days of professional development on average than those who did not want more professional development. The phenomenon was most pronounced in Hungary, Italy, Norway and Portugal (Table 4.6 and Figure 4.7). In Korea and Turkey there is a significant opposite relation.

What is the relation between the need for professional development and teachers' subjects?

With respect to the relation between teachers' subjects and the overall index of professional development need, Table 4.5a shows that the average on this index is significantly higher for teachers in reading, writing and literature than for mathematics teachers and science teachers. For Australia,

the index is higher for reading, writing and literature than for science and both are higher than for mathematics. For Estonia and Poland, the index is higher for reading, writing and literature than for mathematics. For Ireland and Lithuania, the index is higher for reading, writing and literature and for science than for mathematics.

Table 4.5b shows percentages of a moderate or high level of professional development need for areas closely related to teachers' subject field. The differences between the three main subjects are most pronounced in "knowledge and understanding of the main subject field", where, for TALIS countries overall, the moderate or high level of professional development need for mathematics teachers is significantly lower than for science teachers and for teachers in reading, writing and literature. In individual countries these percentages differ significantly in Australia, Denmark, Estonia, Lithuania, Poland, Portugal, Slovenia and Spain. For Austria the percentages differ significantly between science teachers on the one hand and mathematics teachers and teachers of reading, writing and literature on the other.

The differences are smaller with respect to “content and performance standards of the main subject field(s)”. Overall in TALIS countries the percentage of teachers with a moderate or high level of professional development need in this area is significantly higher in reading, writing and literature than in mathematics. This is also true for Australia, Estonia, Ireland, Lithuania, Poland, Portugal and Slovenia individually. For all countries the percentage is also significantly higher for reading, writing and literature than for science, as it is for Ireland, Lithuania, Portugal and Turkey individually.

For “knowledge and understanding of instructional practices in the main subject” only a few differences are significant. Overall, the percentage is higher for reading, writing and literature than for mathematics and for science. For Lithuania, the percentage is higher for both reading, writing and literature and science than for mathematics. For Slovenia, it is higher for reading, writing and literature than for both mathematics and science. For Estonia, it is higher for reading, writing and literature than for mathematics. For Turkey, the percentage is higher for reading, writing and literature than for science.

For “ICT skills for learning” also, only a few differences are significant. Overall, the percentage is higher for reading, writing and literature than for science teachers. For Spain, it is higher for reading, writing and literature than for mathematics and both are higher than for science. For Belgium (Fl.), the percentage is higher for mathematics teachers than for reading, writing and literature.

What is the relationship between the need for professional development and teachers' background?

By performing a multiple regression analysis with the overall index of professional development need as the dependent variable and including background characteristics (teachers' level and school level), an attempt was made to learn the relation between this index and teachers' background characteristics. There is obviously a strong relationship between age and number of years of experience as a teacher. A regression analysis using the index and both these variables showed that the relation

between years of experience and need for professional development was more often significant than the relationship between age and need for professional development. It also showed that excluding age led to a more significant relationship between years of experience and need for professional development. Therefore, this variable (age) was dropped from later analyses.

Table 4.7 shows the results from the final country analyses. It shows first that, with three exceptions, significant relations between professional development need and specific background variables were consistent in sign (positive or negative) among participating countries. This shows that, although some relations are stronger than others, the pattern is usually the same across countries. The relation with the index of professional development need is strongest for gender (in 15 out of the 23 countries female teachers perceive more need). Almost the same number of significant relations was been found for the proportion of working time spent teaching. For 13 countries the analyses show that the smaller the proportion of working time spent teaching, the higher the need for professional development. In 14 countries there was a negative relation between years of experience as a teacher and the index of professional development need, indicating that teachers with less experience tend to have a greater need for professional development. As for the relation between working time per week and need for professional development, in all but two countries it appeared to be negative, indicating that teachers who work more hours per week tend to have less need for professional development, although the relation was significant only for Italy, Hungary, Lithuania and the Slovak Republic. The relationship is significantly positive for Turkey.

When looking at gender, experience and proportion of time spent teaching, all of these variables had a significant negative relation with the need for professional development in six countries: Austria, Belgium (Fl.), Estonia, Korea, Poland and the Slovak Republic. In Brazil, Bulgaria, Denmark, Ireland, Malta, Mexico, Malaysia and Norway the need for professional development appeared to be less influenced by these teacher background variables.

The relation between school characteristics (type of school, school enrolment and size of the community in which the school is located) and the overall index of professional development need appeared less clear than the relation between the teacher characteristics mentioned above and the index of professional development need. For type of school, the index of professional development need is significantly lower in public schools than in private schools in Austria, Brazil, Bulgaria, Denmark, Malta and Portugal, while the opposite is true for Belgium (Fl.). For school enrolment, teachers in schools with fewer students have a significantly higher professional development need than teachers in large schools in Austria, Belgium (Fl.), Bulgaria and Malaysia, but the opposite is true for Lithuania. The size of the community seems only to matter for teachers' need for professional development in Estonia, Malaysia and the Slovak Republic, in the sense that there is greater need in smaller communities, and in Belgium (Fl.) where there is a greater need in larger communities.

Because most of the background variables are ordinal variables rather than interval variables no specific meaning can be ascribed to the numbers in the tables. Thus, the multiple regression analyses indicate directions rather than interpretable values.

In summary, one may say that the data indicate that younger and less experienced teachers have more unmet professional development needs than older and more experienced colleagues. Although at first sight this would appear to be common sense, it is not easy to explain it further. On the one hand, one might say that inexperienced teachers are still in a phase of on-the-job learning. The significant point, however, is that they appear to need more than on-the-job training, namely further professional development. On the other hand, one might argue that younger and less experienced teachers have had initial training that is closer to modern ideas on teaching and learning, so that older teachers might have a greater need for additional professional development. Still another line of reasoning might be that younger and less experienced teachers may be more open to new insights and knowledge related to their job than older and more established teachers.

4.7 Impact of professional development

TALIS asked teachers to report on the impact of their development activities on their development as teachers. Since TALIS reports teachers' perceptions, these results should be treated with some caution as indicators of the effectiveness of these activities. Nevertheless, if teachers feel that a development activity has had limited impact, this is likely to colour their decisions, and perhaps those of their colleagues, regarding future participation in that activity.

Table 4.8 shows the percentage of teachers reporting moderate or high impact for the types of development they had undertaken during the survey period. Their consistently positive view of the impact of all types of development activities is striking. On average across participating countries, teachers reported that the most effective forms of development were "individual and collaborative research", "informal dialogue to improve teaching" and "qualification programmes", for which close to 90% of teachers reported a moderate or large impact on their development as a teacher. The development activities viewed as relatively less effective were attendance at "education conferences and seminars" and taking part in "observation visits to other schools", yet almost 75% of teachers reported a moderate or high impact.

In general, there is little variation in this pattern across countries except in Belgium (Fl.), where teachers take a far less positive view. On average, reports of moderate or high impact were some 20 to 30 percentage points below the international average for most activities. These are teachers who also reported relatively low participation in professional development activities, relatively low demand for more professional development, and relatively low financial or work-related barriers to further participation (Tables 4.2 and 4.4). A possible interpretation of the combination of low participation and low demand may be a perceived lack of impact of professional development activities. This need not necessarily raise concerns about the quality of the development on offer; it could indicate a teacher workforce whose preparation for teaching is well served through initial teacher training.

To a lesser degree than in Belgium (Fl.), teachers in Australia, Austria and Brazil take a relatively less positive view of the impact of most types of development than those in other countries. In Australia this is clearest for “reading professional literature” (where high or moderate impact was reported by 66% of teachers, 16 percentage points below the international average). For Austria, the reported impact of attendance at “educational conferences and seminars” was relatively low (18 percentage points below the international average). In Brazil the impact of “mentoring and peer observation” activities was also well below the international average (by 12 percentage points).

In contrast, the impact reported by teachers in Denmark, Hungary, Lithuania and Poland is more positive than the international average for all types of development.

Education conferences and seminars, although viewed by teachers as one of the less effective types of activities on average across countries, is considered particularly effective by teachers in Malaysia, while teachers in Lithuania found observational visits to other schools very effective, and teachers in Hungary reported a particularly strong impact of mentoring and peer observation.

How does perceived impact relate to participation?

Given the varying patterns of reported impact, it is informative to compare impact and participation across the different types of activities. On average across participating countries, the most obvious contrast between participation and impact is for “qualification programmes”, which ranked second highest (87%) among teachers who reported moderate or high impact of participation, yet the participation rate (25%) was the lowest of all development activities (Tables 4.8 and 4.3). There is also a notable contrast between participation and impact for “individual and collaborative research” for which impact was ranked highest of the nine activities but only sixth in terms of participation.

It is not possible to learn from the TALIS data why these differences occur. However, it may be noted that both qualification programmes and research

are relatively time-intensive. It may not be possible for education systems to allow large proportions of their teachers to spend a great deal of their time on these activities and to finance them as well. The cost and time commitments are likely to present barriers for some teachers as well.

Yet it is striking that the two types of activities that teachers report as having the highest impact on their development are those that they are most likely to have to pay for and commit significant time to. In other words, it is through teachers’ own investment that, on average, they engage in the activities they have found to be among the most effective for their development. Even allowing for the fact that teachers are likely to choose to participate in and pay for activities which they expect to be effective, this is an important finding.

In contrast, courses and workshops and, to a lesser degree, education conferences and seminars have relatively high rates of participation when compared with their reported impact on teachers’ development. In these cases, while these activities may not generally require a large time commitment, the value of high levels of participation might be questioned in view of their relatively low reported impact.

4.8 Support received by teachers for professional development

The level and intensity of participation in professional development activities are in part a function of the types of support that teachers receive to undertake them. Support can take many forms and TALIS asked about possibilities ranging from compulsory development opportunities to formal induction and mentoring support for new teachers. This section examines the different types of support and the relations between the support received and the level and intensity of participation reported.

Compulsory professional development

Professional development may, or may not be, compulsory. Some professional development may be

deemed compulsory because the skills and knowledge the development activities aim to enhance are considered important. In some cases participation in such activities may even be required for teacher certification. It can also be important for teachers to exercise their own professional judgement by identifying and taking part in development activities which they feel to be most beneficial to them. A high degree of compulsory professional development may be indicative of a more highly managed professional development system, with less discretion for teachers to choose the type of development they feel they need.

On average among participating countries, some 51% of the amount of professional development undertaken in the previous 18 months was compulsory (Table 4.2). This ranged from around one-third or less in Austria, Belgium (Fl.), Denmark and Portugal to 78% in Malta and as high as 88% in Malaysia. The countries with the highest number of compulsory days on average were Bulgaria, Italy, Korea, Mexico and Spain, and those with the fewest were Austria, Belgium (Fl.) and Ireland.

The question arises as to whether the amount of teachers' professional development depends on the proportion that is compulsory. At the country level, there does not appear to be a clear relation between the average number of days of professional development and the percentage that is compulsory.

Financial support

In addition to formal entitlement to professional development or mandatory programmes, support for professional development can take a variety of forms. TALIS distinguished between financial support – direct payment of the costs of the development activities or salary supplements for undertaking development – and support in the form of time scheduled to allow for development activities.

On average in participating countries, almost one-quarter of teachers who engaged in some professional development had to pay some of the cost themselves and a further 8% had to pay all of the cost. There are certain differences among countries (Table 4.9).

The TALIS survey responses suggest that there is no country in which professional development is completely free for all teachers. The countries with the highest percentage of teachers who paid nothing for their professional development are Belgium (Fl.), Malta, Slovenia and Turkey, where more than 80% of teachers reported that they paid nothing towards the costs of the professional development they undertook. In contrast, less than half of the teachers in Austria, Malaysia, Mexico and Poland received free professional development, while in Korea only around one-quarter benefited from such support, the lowest proportion among participating countries. Furthermore, some 14% of teachers in Korea had to pay the full cost of the development they undertook, though this percentage was highest in Portugal (25%), Mexico (19%), Brazil (18%) and Italy (18%).

Salary supplements

Salary supplements are a less common means of professional development support. Only 11% of teachers on average (EU countries 13%) received them for activities they had taken part in during the survey period. They were relatively common in Malta, where almost half of teachers received such supplements. It was also a significant means of support in Slovenia (30%) and the Slovak Republic (28%). In addition, both Malta and Slovenia had the highest percentage of teachers who paid nothing towards the cost of their professional development, a sign of relatively generous financial support for professional development (Table 4.9).

Scheduled time

Almost two-thirds of teachers across the participating countries received scheduled time to take part in development activities. This varied substantially: less than 30% in Korea (24%), Portugal (25%) and Spain (29%) and well over 80% in Australia, Austria and Malaysia and over 90% in Ireland (Table 4.9).

Induction and mentoring

Another important type of support for teachers' development takes the form of policies and practices to support teachers who are either new to the profession or new to the school. As noted in the OECD's

review of teacher policy (OECD, 2005), the main challenges facing beginning teachers are remarkably similar across countries: motivating students to learn, classroom management and assessing student work. Induction and mentoring programmes may help new teachers cope with these challenges and combat early dropout from the profession.

TALIS sought to learn the extent to which formal policies and practices for induction and for mentoring of new teachers exist in lower secondary schools. This information was gathered from school principals rather than teachers and allows for examining broader development activities in schools in which such policies do or do not exist.

On average across the participating countries, some 29% of teachers are in schools whose school principals reported no formal induction process for teachers new to the school (Table 4.10). A further 27% of lower secondary teachers are in schools in which formal induction exists but only for teachers who are new to the profession. Thus, fewer than half of teachers were in schools with a formal induction process for all teachers new to the school. However, there is enormous variation among countries.

In Australia, Belgium (Fl.) and the Slovak Republic, formal induction is virtually universal for all teachers who are new to the school. In Ireland, Poland and Slovenia only a small minority of teachers (less than 10%) are in schools with no formal induction process, though induction in Slovenia and Poland is mainly for teachers new to the profession. Formal induction for new teachers is also relatively common in Bulgaria, Estonia, Hungary, Iceland, Korea and Malaysia (Table 4.10).

The situation in these countries contrasts sharply with that in Brazil, where almost three-quarters of teachers are in schools with no induction process and in Lithuania, Malta, Mexico and Spain where the figure exceeds 60%.

A similar picture emerges for mentoring practices. On average across countries, one-quarter of teachers are in schools whose principals reported no formal mentoring programme or policy. A further 38% are in schools in which mentoring is provided only

for teachers new to the profession, and some 37% of teachers are in schools where all teachers new to the school – whether new to teaching or not – receive organised mentoring.

As with practices for induction, policies for mentoring new teachers vary significantly across countries and the cross-country pattern is similar for the two policies. As with induction, mentoring practices are extremely common in Australia, Belgium (Fl.), Poland and the Slovak Republic, though in Poland and the Slovak Republic they are more targeted to teachers new to the profession than to all teachers new to the school (Table 4.10). Moreover, as with induction practices, they are relatively rare in Brazil, Malta, Mexico and Spain where less than 30% of teachers are in schools with formal mentoring practices.

There are nonetheless some countries in which mentoring and induction practices do not necessarily go hand in hand. For example, in Lithuania, although formal induction is relatively rarely provided for new teachers, mentoring is much more common. Only 20% of teachers are in schools that provide no mentoring.

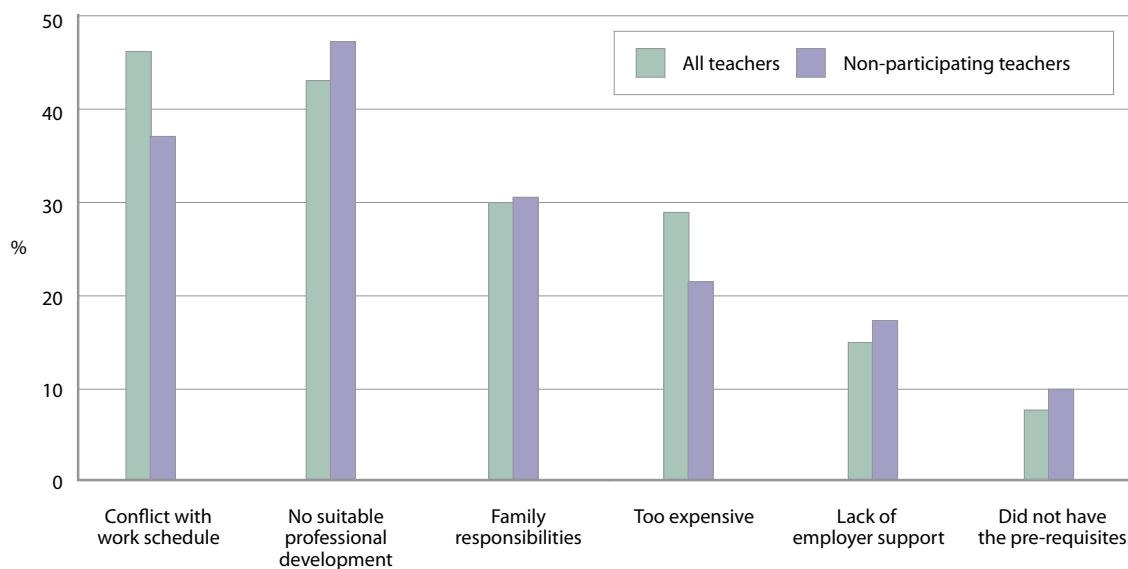
4.9 Barriers that prevent meeting demand

To understand better the take-up of professional development and provide insight into potential policy levers, TALIS asked teachers who had wanted more professional development than they received to indicate the reasons that best explain what had prevented them from doing so. They were entitled to select as many of the options as were appropriate.

Across the 23 participating countries, the most commonly cited reasons for teachers not undertaking more professional development than they did were “conflict with work schedule” (47% of teachers) and “no suitable professional development” (42%). In fact, in all but four countries, one of these factors was the most frequently cited barrier. The exceptions were Hungary, Mexico and Poland where the cost of professional development was the reason most cited (47%, 49% and 51%, respectively) and Malta where “family responsibilities” was the most cited (45%) (Table 4.11).

Figure 4.8 Reasons for not participating in more professional development among TALIS teachers

All teachers compared with teachers who did not participate in professional development



The reasons for not undertaking professional development were also specifically investigated for teachers who did not participate in professional development at all in the 18 months prior to the survey. Table 4.11a shows the results. Figure 4.8 compares the averages among all teachers in all countries with the averages among non-participating teachers in all countries. The relative order of reasons for not participating in more professional development is the same for non-participating teachers and for all teachers.

No suitable development

Not surprisingly, there is a significant negative correlation between the extent to which teachers reported a lack of suitable professional development and the amount of professional development they actually had. In every country, teachers who reported a lack of suitable development on offer as the reason actually participated on average in a smaller number of days of development during the survey period than teachers who did not report this as a barrier. The only exception is Spain, where no

difference was found. This is good evidence of the association between the perceived lack of suitable development on offer and the amount of development teachers embark on (Table 4.6). This is in line with the results in Table 4.11a, which show that teachers who do not participate in professional development report this significantly more often as a reason for non-participation than all teachers.

The lack of suitable professional development seems to be most acute in Austria (Table 4.11). Here almost two-thirds of teachers reported this as a reason for not participating in more professional development than they did, as did more than 50% of teachers in Estonia, Lithuania and the Slovak Republic. In these four countries, the amount of teachers' professional development is below the international average (Table 4.2).

Conflict with work schedule

The countries in which "conflict with work schedule" was most frequently reported as a barrier – Korea (73% of teachers) and Portugal (65%) – are also those

in which teachers were least likely to have received scheduled time for professional development. However, across all countries there is no distinct relation between these two variables. For instance, some 62% of Australian teachers reported “conflict with work schedule” as a barrier, the third highest after Korea and Portugal, and yet 86% of Australian teachers reported receiving scheduled time to support their professional development (Tables 4.11 and 4.9). This would tend to indicate that the scheduled time was either insufficient or not well aligned with the types of professional development that teachers wanted. The conflict with the teacher’s work schedule was seen as less of a problem in Bulgaria and Denmark, although around one-quarter of teachers still reported this as a barrier.

In virtually all countries, teachers who reported “conflict with work schedule” as a reason for not engaging in more professional development actually took more days on average than those who did not cite this as a barrier. As noted earlier, this is in part a consequence of the types of development activities undertaken by these teachers. Analysis of the TALIS database shows that those reporting schedule conflicts as a barrier are more likely to have engaged in qualification programmes and research activities than those who did not.

Teachers who did not participate at all in professional development reported “conflict with work schedule” significantly less (10 percentage points on average) as a reason for not undertaking more professional development than all teachers (Tables 4.11 and 4.11a, Figure 4.10).

Too expensive

Compared with the allocation of scheduled time, there is a slightly stronger relation between the extent to which teachers reported cost as a barrier to taking more professional development and the financial support that they received. In other words, in countries in which a relatively high percentage of teachers had to pay the full cost of professional development, they were more likely to report cost as a barrier. Poland has one of the highest proportions of teachers who had to pay something towards the cost of development, and around 50% reported

cost as a barrier (Tables 4.9 and 4.11). In contrast, cost was less frequently reported as a barrier in Belgium (Fl.) (12%) and Ireland (12%), countries in which relatively few teachers had to pay the cost of their professional development.

Compared with the allocation of scheduled time, there is a slightly stronger relationship between the extent to which teachers reported cost as a barrier to taking more professional development and the financial support that they actually received. In other words when a relatively high percentage of teachers had to pay the full cost of the development they undertook, they were more likely to report cost as a barrier to taking more. This is especially the case in Brazil and Mexico, where around 50% of teachers reported cost as a reason; both countries have a relatively high percentage (18%) of teachers who had to pay the full cost of the development they took. In Poland, with one of the highest proportions of teachers who had to pay something towards the cost, around 50% also reported cost as a barrier (Tables 4.9 and 4.11). In contrast, cost was less frequently reported as a barrier in Belgium (Fl.) (12%), Ireland (12%) and Turkey (12%), three countries in which relatively few teachers had to pay the cost of their professional development.

It is interesting that teachers who reported cost as a barrier to more professional development actually had taken more days on average in the previous 18 months than teachers who did not report this as a barrier. The reason, as noted earlier, is probably that the types of development for which teachers were more likely to have made personal payment are also those that are more time-intensive, particularly enrolment in qualification programmes.

So, in addition to the finding that teachers who had to pay for their development had more unsatisfied demand than those who did not, the preceding analysis shows that for these teachers more than others, cost is a barrier to satisfaction of that demand.

Teachers who did not participate at all in professional development reported cost significantly less (7 percentage points on average) as a reason for not undertaking more professional development than all teachers (Tables 4.11 and 4.11a, Figure 4.10).

Other barriers

On average across participating countries, “lack of employer support” was relatively rarely cited as a barrier (15% of teachers; for teachers not participating at all in professional development, 17%). However, in Denmark more than one-third of teachers reported this as a factor preventing further professional development. In contrast, only a small minority of teachers in Bulgaria (3%), Italy (6%) and Spain (6%) see this as a barrier (Table 4.11).

Although the percentages are quite small, the lack of the necessary prerequisites was significantly more often reported as a barrier by teachers who did not participate at all in professional development activities (10% on average) than by all teachers (7%). The largest differences were found in Estonia (10 percentage points) and Slovenia (7). The lack of prerequisites was mainly reported as a problem in Malaysia, where over one-quarter of teachers reported this as a barrier, followed by more than 15% in Mexico and Turkey.

Family responsibilities were reported as a barrier by 30% of teachers on average. Almost the same percentage of those who did not participate at all in professional development reported this as a barrier. However, in Austria and Bulgaria non-participating teachers reported this much more often (by over 16 percentage points) than all teachers.

4.10 The association of professional development activities and school practices regarding instruction, evaluation and feedback procedures and school management⁵

Professional development activities may interact with other school practices. This may mean, on the one hand, that these activities influence other activities at school, but also that these other activities have

an impact on the degree of participation in certain professional development activities. The analyses presented in the first TALIS report (OECD, 2009) are essentially correlations. They establish the strength of association but not the direction of the influence.

The other school practices associated with teachers’ professional development activities are instructional strategies and beliefs, evaluation and feedback mechanisms, and school management. One might expect, for example, that more recent ideas on learning and instruction, like those associated with constructivism (see Chapter 2), would evoke more professional development activities than more traditional, direct teaching approaches. Similarly one might expect more professional development activity in schools with well-developed evaluation and feedback procedures, as such practices are often meant to stimulate school improvement activities, including targeted use of professional development to compensate for weaker areas of school functioning. Finally, school leadership styles that emphasise development of human resources might be more strongly associated with collaborative forms of professional development activities than individual forms.

Teaching practices, teachers’ beliefs and attitudes

The first TALIS report (OECD, 2009) presents a theoretical framework on learning and instruction in which the central distinction is between direct transmission and constructivist beliefs and practices. This distinction is also addressed in Chapter 2 of this report. More specifically, teaching practice was grouped into three kinds of practices: structuring practices (related to subject matter), student-oriented practices (e.g. student work in small groups), and “enhanced activities”, such as students working on projects that take at least one week to complete.

The relevant chapter in the first TALIS report (OECD, 2009, Chapter 4) draws the following conclusions, with respect to the association of professional development activities and instructional beliefs and practices:

- Professional development is generally associated with more (reported) use of specific

⁵ This section summarises key findings of the first TALIS report (OECD, 2009).

instructional practices. This means that teachers who engage in professional development tend to use specific practices more often.

- The kind of professional development a teacher participates in is more important than the amount of time invested. The net effects of days of professional development are small and only significant in a few countries, whereas all three indicators for kind of professional development (namely, workshops/courses, networks and mentoring) have significant net associations with teaching practices.
- Professional development activities that take place at regular intervals and involve teachers in a rather stable social and collaborative context (*i.e.* networks or mentoring) have a significantly stronger association with teaching practices than regular workshops and courses. In only a few countries did teachers who had attended workshops or courses for professional development during the previous 18 months differ significantly from teachers who did not, in terms of structuring, student-oriented practices, and enhanced activities. Differences in terms of the reported frequency of all three teaching practices are more frequently found between teachers who had participated in mentoring or networks for professional development and those who had not.
- Student-oriented practices and enhanced activities are more strongly associated with professional development than structuring practices. The effects of participation in professional development mentoring and networks on student orientation and on enhanced activities are significant in a large majority of countries and the strength of the associations is greater, as indicated by larger beta coefficients.

School evaluation, teacher appraisal and feedback

Evaluation and feedback mechanisms are increasingly seen as a tool for school improvement. Evaluations may be directed at the outcomes and processes of schooling, and be applied in a context

of external accountability or internal reflection. In both cases it is feedback on the actual functioning of the school and/or individual teachers which provides the link to improvement-oriented actions. Professional development activities are among the types of improvement-oriented actions which the school can consider.

In gathering data for TALIS, the following definitions were applied:

- School evaluation refers to an evaluation of the whole school rather than of individual subjects or departments.
- Teacher appraisal and feedback occurs when a teacher's work is reviewed by the school principal, an external inspector or the teacher's colleagues. The appraisal can range from a more formal, objective approach to a more informal, subjective approach.

With respect to the link between evaluation and feedback and professional development, TALIS provides data on the degree to which schools react to the outcomes of evaluation and feedback with certain measures, among which professional development activities.

The first TALIS report (OECD, 2009, Table 5.5) addresses the degree to which countries reacted to outcomes of evaluation and appraisal by providing professional development opportunities. On average, across TALIS countries, just under one-quarter of teachers reported that appraisal and feedback led to a moderate or a large change in their opportunities for professional development. The highest scores were in Bulgaria (42%), Estonia (36%), Lithuania (42%), Malaysia (51%), Poland (38%) and Slovenia (36%). Slightly more teachers reported changes in their work responsibilities and 30% in their role in school development initiatives.

The first TALIS report (OECD, 2009, Table 5.6) also shows that, in a number of countries, identified weaknesses were simply reported to teachers, rather than followed up with development or training plans. This appears to indicate either that teacher appraisal is not linked to professional

development or that professional development is not common. Up to one-quarter of teachers worked in schools whose principal reported that they never established a development plan if an appraisal identified weaknesses; this was the case in Austria (23%), Estonia (11%), Hungary (12%), Ireland (19%), Korea (17%), Norway (20%), Poland (11%), Portugal (14%), the Slovak Republic (13%), Slovenia (16%) and Spain (22%). However, the use of teacher appraisal and feedback for professional development appears to be prevalent in some countries. In Australia (58%) and Mexico (35%) at least one-third of teachers had school principals who reported that they always established a development plan. Moreover in some countries it is common to discuss measures to remedy weaknesses with teachers: over three-quarters of teachers in Hungary (81%), Lithuania (76%) and Poland (83%) worked in schools whose principal reported that they always discussed these measures with the teachers concerned.

These findings seem to indicate that the potential for following up on weaknesses with professional development activities is not fully utilised in most countries. At the same time, it should be recognised that professional development may be considered more cumbersome and less flexible than direct discussion of weaknesses between principal and teachers.

School leadership and management

In the first TALIS report (OECD, 2009) two basic management styles were identified: an instructional leadership style and an administrative leadership style. An instructional management style is characterised by explicit management of the goals and curriculum of the school, actions to improve teachers' instruction, and direct supervision of teachers' instructional learning outcomes. An administrative leadership style focuses on managing accountability to stakeholders and on the monitoring of bureaucratic procedures.

The findings presented in the first TALIS report (OECD, 2009, Table 6.11), indicate the relation between some indicators of professional development and leadership styles when controlling for

a number of teachers' professional and personal characteristics: gender, level of experience, educational training, permanency of the teaching positions, how many schools they teach in, and size of the community in which the school is located.

The results indicate that in most TALIS countries neither leadership style is related to the number of days of professional development completed or to teachers' satisfaction with the number of days received. There is some relation in a few countries but no consistent pattern. For instance, in Bulgaria, Iceland, Malta and Slovenia, the degree of unsatisfied demand for professional development was greater in schools with a stronger administrative leadership style, but this was also the case in Hungary, Iceland, Malta and Turkey in schools with a strong instructional leadership style.

Conclusion

Professional development activities appear to be relatively loosely linked with school practices in the areas of instruction, evaluation and feedback, and school leadership. Chapter 5 will return to this issue, when examining a more complex model of conditions associated with the perceived impact of professional development activities. The general outcome of this section might be connected to policies aimed at stronger integration of different functional domains of schooling. The success of the Comprehensive School Reform Program in the United States (see for example Borman *et al.*, 2003) could be seen as underlining this argument.

4.1 I Summary and policy discussion

This chapter has reviewed current patterns of participation in professional development activities by lower secondary education teachers. It has examined the extent to which teachers' demand for professional development is being met and how this varies according to the types of support teachers have received and what they have perceived as hindrances to engaging in more than they did. Finally, it has analysed the types of activities that teachers reported as having had the greatest impact on their development as teachers.

The chapter set out to answer three questions about the amount of teachers' professional development, the extent to which it meets their needs, and how it could be improved. This provides the framework for a reiteration of key results and a discussion of what can be learned.

How much does the amount and profile of teachers' professional development vary within and among countries?

The chapter first examined the patterns of participation in professional development reported by teachers.

Key results

- The level and intensity of participation in professional development varies considerably among countries. Nearly nine in ten teachers take part in some sort of activity, but since the definition of professional development is broadly drawn, the fact that in some countries up to one teacher in four receives none is a source of concern.
- The strongest relation between non-participation in professional development and teacher characteristics has been found with qualification level: teachers with lower qualification levels show relatively higher levels of non-participation than teachers with higher qualification levels. This pattern is consistent across almost all participating countries. The non-participation rate also varies significantly by gender (higher non-participation rates among male teachers) and age group (higher non-participation rates among the youngest and the oldest teachers).
- Intensity of professional development varies across countries more than participation, with Korea and Mexico seeing teachers participating on average for over 30 days in 18 months, twice the average rate (Table 4.2). For the EU countries, Bulgaria, Italy, Poland and Spain report teachers participating on average for about 26 days in 18 months, almost twice the average rate for participating EU countries (Table 4.2).
- Within-country variation in the intensity of professional development can be high and is greatest in Italy, Korea, Mexico, Poland and Spain; older teachers tend to receive less than the average, though the pattern by gender is more mixed (Table 4.2a).
- The types of development undertaken by teachers explain some of these variations. Countries in which a high percentage of teachers take part in "qualification programmes" or "individual and collaborative research" tend to have a higher average number of days of development. However, only a small minority of teachers participate in these activities. On the other hand, virtually all teachers engage in "informal dialogue to improve teaching" and the great majority attend some form of "courses and workshops" (Tables 4.2 and 4.3).
- There is a clear difference between western European countries and other countries with respect to the types of professional development undertaken by teachers. In particular, participation in "mentoring and peer observations", "qualification programmes", "reading professional literature" and "observational visits to other schools" is consistently lower in western European countries than in others (Table 4.3).
- The pattern of participation in types of professional development is more similar in western European than in eastern European countries (Figure 4.1).

Discussion

The high average participation in development activities among lower secondary teachers is unquestionably a positive message from the TALIS results. Nevertheless, the fact that an average of some 11% of teachers did not take part in any of the more structured forms of professional development in the 18 months prior to the survey may be a concern (Table 4.2).

On the other hand, even if not all teachers engage in more organised types of activities, it is reassuring that virtually all engage in informal dialogue with others to improve their teaching and that the vast majority read professional literature. However, some of the more collaborative forms of development are more evident in some countries than in others.

How well are teachers' professional development needs being met?

Analysis of the TALIS data reveals that despite high levels of participation in development activities, the professional development needs of a significant proportion of teachers are not being met.

Key results

- More than half of the teachers surveyed reported that they wanted more professional development than they received during the 18-month survey period. The extent of unsatisfied demand is sizeable in every country, ranging from 31% in Belgium (Fl.) to 76% in Portugal and over 80% in Brazil, Malaysia and Mexico (Table 4.4).
- Across countries, teachers who were more likely to report unsatisfied demand were in public schools, female and under 40 years of age (Table 4.4). In general, teachers' background characteristics have a more significant relation with professional development need than with school characteristics (Table 4.7).
- Across countries, the aspects of teachers' work with greatest development need are: "teaching special learning needs students", followed by "ICT teaching skills" and "student discipline and behaviour" (Table 4.10). These findings corroborate some of the earlier results based on EU studies, presented in Chapter 3.
- Across countries, fewer mathematics teachers than teachers of other subjects report a need for more professional development. This is most pronounced in the knowledge and understanding of the main subject field a teacher teaches (Tables 4.5a and 4.5b).

Discussion

A certain level of unsatisfied demand is to be expected; it is natural that a certain proportion of teachers will at some time not feel fully equipped to carry out their work effectively. Nonetheless, the extent of unsatisfied demand appears large, and in some countries the great majority of teachers state that they need more professional development than they receive.

TALIS does not measure the extent to which this undermines the effectiveness of the teacher workforce in the participating countries, but it is difficult to imagine that such deficits are not to some extent detrimental to effective teaching and learning.

The information from TALIS gives policy makers clear pointers to the main deficits in each country. In terms of the topics for which development needs are greatest, it is striking how consistently countries reported a high level of need for development in the area of teaching students with special learning needs. This indicates a clear recognition on the part of teachers that they do not feel properly equipped to deal with increasingly heterogeneous groups and to address the learning needs of weaker as well as stronger students.

An individual teacher's amount of development is predictably correlated with the type of activity they have taken part in: teachers engaged in qualification programmes and research activities have to devote more time to them than those who attend conferences or workshops. An important discovery from TALIS is that unsatisfied demand exists no matter what activities teachers have engaged in.

How best should unsatisfied demand for professional development be addressed?

The chapter examines the support mechanisms that are in place for teachers and also the barriers that teachers reported as preventing them from engaging in more professional development. The analysis also reveals how these relate to teachers' participation and their desire for more professional development.

Key results

- The principal cause of unfulfilled demand, according to teachers, is conflict with their work schedule, but they also often cited lack of suitable development opportunities. Those who did not participate at all in professional development were most likely to cite the latter (Tables 4.11 and 4.11 a). Teachers who reported a lack of suitable development activities spent much less time on professional development activities than other teachers (Table 4.6).
- The most effective types of development, according to teachers, are those in which they participate least – programmes leading to a qualification and, to a lesser degree, research activities. The most effective types of development are also those for which teachers are more likely to have had to pay the full or partial cost and devote the most time to (Table 4.8).

Discussion

The degree of unsatisfied demand reported by teachers is troubling and may suggest a misalignment between the support provided and teachers' development needs in terms of content and modes of delivery.

For modes of delivery, the evidence from TALIS is very revealing. It is striking that the activities that teachers report as most effective for their development are also those for which they are more likely to have had to pay full or partial cost and to which they devote the most time. This need not mean that the cost of all teachers' participation in qualification programmes and research should be fully paid for, but a better balance should perhaps be sought between who pays and who benefits.

The 42% of teachers (45% in the EU) who reported a lack of suitable professional development activities to satisfy their needs is an equally worrying finding (Table 4.11). It indicates that carefully comparing provision and support with development needs should be a priority in many participating countries.

To what extent is professional development of teachers associated with other school policies and practices?

In the first TALIS report (OECD, 2009) different aspects of the professional development of teachers are related to other school practices, namely teaching strategies, evaluation and feedback mechanisms, and school leadership.

Key results

- Professional development activities that take place at regular intervals and involve teachers in a rather stable social, collaborative context (*i.e.* networks or mentoring) have a significantly stronger association with teaching practices than regular workshops and courses.
- Student-oriented practices and enhanced activities are more strongly associated with professional development than structuring practices.
- The first TALIS report (OECD, 2009, Table 5.6) shows that, in a number of countries, identified weaknesses were more often simply reported to teachers rather than followed up with development or training plans.
- In most TALIS countries neither leadership style is related to the number of days of professional development or to teachers' satisfaction with the amount of professional development days they received.

Discussion

It should be emphasised that the associations mentioned in the list of key results represent correlation rather than causation. The reported results on the association of contexts of professional development and teaching practices seem to suggest that a stable collaborative context enhances implementation in actual teaching practice. Next, a teaching emphasis characterised as student-oriented and dedicated to enhanced

activities (e.g. special projects) is found together with greater intensity (in terms of number of days) of professional development. This may be seen as an indication that more recently developed teaching approaches require more professional development support than more traditional forms of (structured) teaching.

The fact that results of evaluation and appraisal were less often followed up with initiatives for professional development than directly reported to teaching staff may indicate the need to make professional development activities more readily available. This might be easier if professional development becomes more continuous and embedded in the routine functioning of the school as the ideal of the school as a learning organisation becomes more widespread.

The relatively loose coupling of leadership and participation in and satisfaction with professional development is a somewhat troubling finding, since stimulating professional development is generally seen as a key aspect of educational leadership. Findings like these underline the potential of school improvement practices that are integrated, rather than partial and fragmented.

References

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ANNEX 4.A1

Precision and standard error of estimates; significance of differences

All tables show either means or percentages. Formally these means are estimates of the means in the whole population concerned. The precision of these estimates, in relation to the real mean of the whole population is expressed in the standard error (SE) of the estimate. The real mean will, with a probability of 95%, lie within two SEs of the estimated mean. This is called the confidence interval. If the estimated mean is *e.g.* 10.0 and the SE is 0.5, the confidence interval will be $10.0 - 2 * 0.5 - 10.0 + 2 * 0.5$, *i.e.* 9.0 – 11.0. If the SE is larger, *e.g.* 4.0, the confidence interval is 2.0 – 18.0, and the real value may deviate rather more from the estimate of 10.0. The main reason for large SE values is the number of respondents within a category. When 90% of the teachers in a country work in a public school and 10% in a private school, the SEs for estimates for the category private schools will be much larger than for public schools, *i.e.* the estimates for private schools will be less precise. The same holds for percentages as for means, except that the SE of a percentage depends not only on the number of respondents, but also on the percentage itself. SEs for percentages close to 0% or to 100% will be much smaller than SEs for percentages close to 50%.

In some tables (*e.g.* those related to teachers' qualification level), categories which include less than 5% of a country's teachers are explicitly noted. As explained above, these cells usually coincide with relatively high SEs.

What does this mean for differences in means between categories? An SE for each difference can be computed from the SEs of each of the components and the numbers of respondents involved. Roughly, this SE is the square root of the sum of the squares of both SEs: $SE_{diff} = \sqrt{SE_1^2 + SE_2^2}$. If both SE_1 and SE_2 have about the same size, SE_{diff} would be roughly $1.4 * SE_1$. If one of the SEs is much larger than the other, then SE_{diff} is just a bit higher than this highest value. A difference is usually called significant if the difference is larger than $2 * SE_{diff}$. This is called significance at the 5% level with two-sided

testing. If testing is one-sided (*i.e.* if the direction of a possible difference is supposed to be known in advance) a difference larger than $1.65 * SE_{diff}$ would be considered significant at the 5% level.

In this chapter a significant difference always means significant at the 5% level with two-sided testing. A few tables contain explicit information about significance, in some other instances significant differences between categories are mentioned in the text.

Cluster analysis

Cluster analysis is a technique which groups (clusters) entities on the basis of the similarities between the entities. This study uses an approach, which is classified as hierarchical cluster analysis. In a hierarchical cluster analysis entities are combined step by step into clusters which are combined into larger clusters. The process can technically be continued until one big cluster has been formed. Usually the interpretation of a cluster analysis is based both on the order of clustering and on the result when just a few clusters are left.

In this study the entities are countries and the measure of similarity is the difference of a country's scores (either percentages or means) on a set of variables. In this case small differences among countries mean that they are very similar. The similarity measure used is the Euclidean distance between countries based on the set of variables. For a cluster of more than two countries the similarity concerns the average similarity of all pairs of countries within a cluster. The lower the Euclidean distance, the higher the similarity. The cluster process starts by grouping the countries with the highest degree of similarity. This can be represented in a figure by bracketing these countries and then by bracketing further single countries or clusters based on the next highest levels of similarity. At the end of the process all countries would be grouped together as one cluster. Determining the most meaningful level of clustering is a matter of interpretation. In this chapter, the process is described as moving from left to right and the horizontal axis of the figure displays both the average Euclidean distance and the step in the clustering process.

Table 4.1 Non-participation rate in professional development in the previous 18 months (2007-08) - teacher characteristics

Percentages of teachers who did not participate in professional development activities

Countries	All teachers			Teachers by gender						Teachers by age group						Teachers by qualification level						
	% (SE)	Female teachers		Male teachers		Teachers aged under 30		Teachers aged 30-39 years		Teachers aged 40-49 years		Teachers aged 50+ years		Teachers with qualification at ISCED level 5B or below		Teachers with an ISCED level 5A bachelor's degree		Teachers with an ISCED level 5A master's degree or a higher level of qualification				
		%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	
Austria	3.4	(0.37)	3.2	(0.39)	3.8	(0.66)	6.4	(1.39)	5.9	(1.08)	2.4	(0.44)	3.0	(0.49)	1.7	(0.32)	18.4	*	(6.14)	5.9	(0.85)	
Belgium (Fl.)	9.7	(0.73)	9.5	(0.88)	9.9	(1.10)	8.9	(1.55)	9.4	(1.15)	8.8	(1.38)	11.7	(1.34)	9.7	(0.74)	9.0	*	(2.41)	7.6	(1.65)	
Bulgaria	11.7	(1.17)	10.8	(1.06)	16.1	(3.67)	14.9	(3.59)	14.0	(2.67)	11.6	(1.73)	9.6	(1.31)	13.5	(3.03)	13.7		(2.71)	10.7	(1.67)	
Denmark	24.4	(1.26)	22.2	(1.61)	27.4	(1.99)	40.6	(3.82)	25.4	(2.26)	25.1	(2.55)	19.7	(1.82)	30.6	*	(9.19)	24.5	(1.32)	21.7	(4.70)	
Estonia	7.3	(0.50)	5.5	(0.46)	16.2	(1.64)	16.5	(2.18)	6.1	(0.94)	6.0	(0.73)	6.3	(0.79)	16.9	(2.36)	8.0	(0.88)	3.9	(0.54)		
Hungary	13.1	(1.77)	11.7	(1.76)	17.7	(2.77)	24.7	(6.94)	8.6	(1.43)	10.0	(1.10)	15.9	(2.44)	26.3	*	(18.77)	11.7	(1.38)	15.9	(2.75)	
Ireland	10.3	(0.78)	10.9	(0.88)	9.0	(1.25)	12.1	(1.50)	10.2	(1.73)	8.6	(1.30)	10.3	(1.42)	6.0	*	(2.72)	10.7	(0.87)	9.9	(2.12)	
Italy	15.4	(0.76)	14.2	(0.86)	19.6	(1.39)	18.2	(4.23)	16.5	(1.74)	14.7	(1.12)	15.4	(0.98)	21.9	(1.97)	17.1		(2.61)	14.1	(0.77)	
Lithuania	4.5	(0.40)	3.8	(0.41)	8.7	(1.26)	13.0	(2.12)	4.3	(0.80)	2.9	(0.57)	4.1	(0.85)	9.9	(1.30)	3.9		(0.62)	2.8	(0.57)	
Malta	5.9	(0.75)	6.3	(0.93)	5.2	(1.06)	9.5	(1.82)	4.0	(0.98)	3.6	(1.71)	5.0	(1.48)	6.3	(1.66)	5.1		(0.88)	9.5	(2.77)	
Poland	9.6	(0.67)	9.1	(0.80)	11.2	(1.36)	10.2	(1.69)	6.3	(0.82)	9.3	(1.14)	18.3	(2.49)	25.3	*	(8.06)	11.0	*	(2.83)	9.2	(0.71)
Portugal	14.2	(0.87)	12.6	(1.01)	17.9	(1.72)	17.8	(2.86)	15.4	(1.28)	10.9	(0.98)	16.8	(2.01)	23.1	*	(3.91)	14.3		(0.94)	9.9	(1.71)
Slovak Republic	25.0	(1.13)	23.5	(1.26)	31.8	(2.10)	24.6	(1.99)	19.4	(2.13)	17.5	(1.95)	34.3	(2.40)	54.2	*	(7.45)	16.8	*	(11.70)	24.4	(1.13)
Slovenia	3.1	(0.35)	2.7	(0.38)	4.5	(0.89)	5.7	(1.40)	4.7	(0.66)	1.3	(0.34)	2.7	(0.75)	2.4	(0.49)	3.8		(0.51)	0.0	(0.00)	
Spain	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0		(0.00)	0.0	(0.00)	
EU (TALIS) average	10.5	(0.23)	9.7	(0.25)	13.3	(0.45)	14.9	(0.76)	10.0	(0.38)	8.8	(0.34)	11.5	(0.40)	16.5	(1.64)	11.2		(0.97)	9.7	(0.49)	
Australia	3.3	(0.43)	3.4	(0.59)	3.2	(0.66)	2.9	(0.77)	4.2	(1.05)	2.5	(0.74)	3.7	(0.80)	0.0	*	(0.00)	3.7		(0.51)	1.6	(0.71)
Brazil	17.0	(1.21)	15.5	(1.30)	21.3	(1.88)	19.0	(2.62)	17.3	(1.62)	14.1	(1.36)	20.1	(2.43)	21.6	(5.25)	16.7		(1.08)	12.0	*	(3.79)
Iceland	22.9	(1.10)	20.3	(1.33)	28.6	(2.24)	44.8	(3.83)	20.4	(1.87)	19.5	(1.94)	18.5	(2.25)	31.8	(2.13)	18.7		(1.24)	18.2	(4.62)	
Korea	8.1	(0.59)	8.0	(0.65)	8.3	(0.91)	3.6	(1.18)	7.4	(1.01)	8.2	(0.83)	12.4	(1.56)	13.8	*	(12.81)	9.6		(0.73)	5.2	(0.79)
Malaysia	8.3	(0.67)	7.6	(0.72)	9.5	(1.02)	12.3	(1.66)	6.8	(0.76)	8.1	(0.94)	7.2	(1.50)	10.5	(1.39)	8.1		(0.70)	6.6	(1.84)	
Mexico	8.5	(0.60)	8.6	(0.88)	8.3	(0.80)	10.9	(1.74)	8.7	(1.25)	6.5	(0.97)	9.8	(1.35)	9.7	(1.89)	7.9		(0.66)	7.2	(1.57)	
Norway	13.3	(0.87)	11.5	(1.04)	16.0	(1.64)	13.2	(2.13)	13.2	(1.47)	12.0	(1.99)	14.1	(0.98)	24.8	*	(9.24)	13.5		(1.01)	11.6	(1.59)
Turkey	25.2	(2.09)	28.3	(2.35)	22.0	(2.51)	27.4	(3.63)	23.3	(2.18)	22.8	(4.01)	26.7	(5.74)	24.5	(4.29)	25.3		(2.36)	26.0	(6.66)	
TALIS average	11.5	(0.20)	10.8	(0.22)	13.8	(0.35)	15.5	(0.58)	10.9	(0.31)	9.8	(0.32)	12.4	(0.41)	16.7	(1.31)	11.8		(0.65)	10.2	(0.52)	

Note: * denotes categories that include less than 5% of teachers

Sources: OECD, 2009, Table 3.1 and OECD, TALIS Database

Table 4.1a. Non-participation rate in professional development in the previous 18 months (2007-08) - school characteristics

Percentages of teachers who did not participate in professional development activities

Countries	Teachers by type of school				Teachers by size of the community in which the school is located									
	Teachers in public schools		Teachers in private schools		Teachers in schools in a village		Teachers in schools in a small town		Teachers in schools in a town		Teachers in schools in a city		Teachers in schools in a large city	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
Austria	3.1	(0.40)	6.3	(1.31)	1.5	(0.49)	2.5	(0.53)	3.7	(0.80)	1.4	(0.97)	9.0	(1.37)
Belgium (Fl)	11.2	(0.91)	9.1	(1.00)	10.5	*	9.2	(1.66)	9.8	(0.81)	10.8	(1.53)	a	a
Bulgaria	11.6	(1.17)	20.6	(18.25)	11.7	(3.52)	12.2	(3.86)	11.1	(1.55)	9.7	(1.36)	14.7	(2.51)
Denmark	24.7	(1.60)	23.0	(3.09)	27.8	(4.07)	25.1	(2.41)	20.4	(2.07)	24.1	(2.87)	25.0	(3.63)
Estonia	7.3	(0.51)	3.5	(2.16)	9.6	(0.94)	5.4	(0.94)	5.8	(1.13)	6.4	(0.89)	a	a
Hungary	12.2	(1.15)	16.9	(6.00)	9.1	(2.65)	15.9	(2.16)	13.5	(2.74)	14.6	(2.48)	12.9	(2.38)
Ireland	7.6	(1.19)	12.7	(1.29)	8.6	(2.00)	8.2	(1.14)	13.1	(2.05)	11.6	(4.12)	12.6	(2.26)
Italy	15.2	(0.81)	11.0	(2.82)	14.3	(4.49)	15.2	(1.03)	15.6	(1.45)	10.4	(1.79)	20.3	(3.13)
Lithuania	4.5	(0.40)	5.2	(1.17)	6.2	(0.69)	4.6	(1.41)	3.4	(0.75)	3.8	(0.59)	a	a
Malta	3.6	(0.81)	10.8	(1.29)	17.6	(3.22)	3.9	(0.82)	5.5	(1.51)	a	a	a	a
Poland	9.7	(0.71)	8.8	(1.34)	11.9	(1.39)	9.1	(1.16)	7.9	(1.30)	8.3	(1.66)	7.3	(1.86)
Portugal	14.8	(0.95)	10.3	(2.58)	10.6	(1.90)	13.8	(1.31)	15.8	(1.61)	14.6	(2.75)	25.4	(12.05)
Slovak Republic	25.8	(1.33)	19.5	(3.45)	27.5	(2.81)	24.3	(2.57)	22.0	(2.00)	28.0	(2.15)	a	a
Slovenia	3.1	(0.37)	a	a	3.1	(0.74)	3.4	(0.62)	2.9	(0.95)	2.2	(0.94)	a	a
Spain	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
EU (TALIS) average	10.3	(0.24)	11.3	(1.46)	11.3	(0.63)	10.2	(0.44)	10.0	(0.40)	10.4	(0.54)	14.1	(1.53)
Australia	3.3	(0.51)	3.3	(0.73)	0.7	(0.70)	5.9	(1.54)	2.8	(0.65)	3.8	(1.07)	2.7	(0.73)
Brazil	17.0	(1.43)	16.9	(1.84)	18.9	(4.79)	17.2	(2.56)	14.5	(1.68)	16.3	(1.99)	18.7	(2.22)
Iceland	22.2	(1.28)	31.2	(9.29)	24.4	(2.03)	18.5	(2.61)	23.7	(2.78)	21.8	(4.59)	a	a
Korea	7.6	(0.67)	12.3	(1.72)	6.2	(3.01)	8.6	(2.42)	7.9	(2.15)	9.1	(0.91)	7.9	(1.00)
Malaysia	8.1	(0.70)	20.2	(12.49)	11.2	(1.62)	7.0	(0.97)	7.2	(1.25)	10.0	(1.93)	4.5	(1.75)
Mexico	8.8	(0.60)	6.4	(2.16)	8.9	(1.99)	6.9	(1.47)	8.1	(1.25)	6.8	(0.86)	10.8	(1.69)
Norway	13.4	(0.93)	9.7	(2.25)	11.8	(1.83)	15.3	(1.53)	12.5	(1.53)	12.6	(1.81)	a	a
Turkey	25.3	(2.30)	15.6	(2.64)	44.8	(7.52)	20.2	(4.33)	23.7	(2.60)	22.3	(3.92)	22.6	(5.77)
TALIS average	11.3	(0.21)	12.4	(1.19)	12.9	(0.60)	11.0	(0.41)	10.9	(0.34)	11.3	(0.47)	13.0	(1.02)

Note: * denotes categories that include less than 5% of teachers

Source: OECD, TALIS Database

Table 4.2. Participation of teachers in professional development in the previous 18 months (2007-08)

Participation rates, average number of days and compulsory days of professional development undertaken by teachers of lower secondary education in 18 months prior to the survey

Countries	Percentage of teachers who undertook some professional development in the previous 18 months		Average days of professional development across all teachers		Average days of professional development among those who received some		Average percentage of professional development days taken that were compulsory	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	96.6	(0.37)	10.5	(0.17)	10.9	(0.16)	31.4	(0.66)
Belgium (Fl.)	90.3	(0.73)	8.0	(0.38)	8.8	(0.42)	33.6	(0.95)
Bulgaria	88.3	(1.17)	27.2	(1.65)	30.8	(2.04)	46.9	(2.11)
Denmark	75.6	(1.26)	9.8	(0.34)	12.9	(0.40)	34.6	(1.43)
Estonia	92.7	(0.50)	13.1	(0.29)	14.2	(0.31)	49.2	(1.20)
Hungary	86.9	(1.77)	14.5	(0.50)	16.7	(0.41)	46.1	(1.58)
Ireland	89.7	(0.78)	5.6	(0.21)	6.2	(0.21)	41.4	(0.99)
Italy	84.6	(0.76)	26.6	(0.98)	31.4	(1.17)	40.0	(1.08)
Lithuania	95.5	(0.40)	11.2	(0.21)	11.8	(0.21)	56.6	(0.98)
Malta	94.1	(0.75)	7.3	(0.25)	7.8	(0.26)	78.4	(1.07)
Poland	90.4	(0.67)	26.1	(1.10)	28.9	(1.20)	41.0	(1.14)
Portugal	85.8	(0.87)	18.5	(0.89)	21.6	(1.01)	35.1	(0.99)
Slovak Republic	75.0	(1.13)	7.2	(0.30)	9.6	(0.38)	44.1	(1.19)
Slovenia	96.9	(0.35)	8.3	(0.20)	8.6	(0.20)	60.5	(0.93)
Spain	100.0	(0.03)	25.6	(0.51)	25.6	(0.51)	66.8	(0.99)
EU (TALIS) average	89.5	(0.23)	14.6	(0.17)	16.4	(0.20)	47.1	(0.31)
Australia	96.7	(0.43)	8.7	(0.19)	9.0	(0.20)	47.3	(1.17)
Brazil	83.0	(1.21)	17.3	(0.70)	20.8	(0.79)	40.2	(1.17)
Iceland	77.1	(1.10)	10.7	(0.44)	13.9	(0.56)	49.9	(1.30)
Korea	91.9	(0.59)	30.1	(0.57)	32.7	(0.55)	46.9	(0.85)
Malaysia	91.7	(0.67)	11.0	(0.32)	11.9	(0.33)	88.1	(0.64)
Mexico	91.5	(0.60)	34.0	(1.60)	37.1	(1.78)	66.4	(1.22)
Norway	86.7	(0.87)	9.2	(0.30)	10.6	(0.34)	55.5	(1.25)
Turkey	74.8	(2.09)	11.2	(0.52)	14.9	(0.65)	72.8	(1.65)
TALIS average	88.5	(0.20)	15.3	(0.14)	17.3	(0.16)	51.0	(0.25)

Source: OECD, 2009, Table 3.1

Table 4.2a. Amount of professional development undertaken by teachers in the previous 18 months (2007-08) - teacher characteristics

Average number of days of professional development undertaken by teachers with different characteristics [among those teachers of lower secondary education who took some professional development]

Countries	Teachers by gender		Teachers by age group				Teachers by qualification level		
	Female teachers	Male teachers	Teachers aged under 30 years	Teachers aged 30-39 years	Teachers aged 40-49 years	Teachers aged 50+ years	Teachers with qualification at ISCED level 5B or below	Teachers with an ISCED level 5A bachelor's degree	Teachers with an ISCED level 5A master's degree or a higher level of qualification
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)
Austria	11.2 (0.20)	10.3 (0.23)	12.4 (0.72)	10.5 (0.47)	11.3 (0.25)	10.5 (0.25)	11.3 (0.22)	14.1 *	10.2 (0.25)
Belgium (Fl.)	8.5 (0.55)	9.5 (0.48)	8.7 (0.62)	8.8 (0.79)	8.6 (0.61)	9.2 (0.88)	8.6 (0.44)	15.5 *	8.0 (0.72)
Bulgaria	30.7 (2.00)	31.5 (3.79)	27.3 (5.36)	34.2 (4.29)	33.6 (4.21)	26.8 (1.67)	28.0 (4.37)	28.4 (3.40)	32.3 (2.93)
Denmark	13.4 (0.53)	12.3 (0.68)	17.3 (3.02)	13.4 (0.70)	15.8 (1.07)	10.3 (0.50)	12.8 *	12.4 (0.39)	18.7 (1.83)
Estonia	14.6 (0.36)	11.6 (0.51)	15.3 (1.19)	16.8 (0.80)	15.2 (0.55)	11.8 (0.36)	14.7 (1.02)	13.3 (0.43)	14.9 (0.43)
Hungary	16.6 (0.52)	16.9 (1.28)	15.4 (1.05)	16.3 (0.95)	18.3 (0.80)	15.4 (1.29)	23.2 *	17.1 (0.53)	15.7 (0.59)
Ireland	6.0 (0.23)	6.7 (0.45)	5.8 (0.49)	6.6 (0.49)	6.8 (0.45)	5.7 (0.30)	5.9 *	5.9 (0.25)	7.9 (0.65)
Italy	30.5 (1.12)	34.8 (2.52)	64.1 * (12.08)	50.1 (3.36)	30.4 (1.54)	24.1 (1.04)	28.4 (1.53)	26.3 (3.81)	32.0 (1.25)
Lithuania	12.1 (0.24)	10.1 (0.46)	11.2 (0.75)	11.5 (0.41)	12.5 (0.34)	11.4 (0.31)	11.1 (0.54)	11.5 (0.32)	12.5 (0.34)
Malta	7.9 (0.39)	7.6 (0.32)	7.7 (0.51)	7.5 (0.42)	8.6 (0.86)	7.9 (0.50)	7.6 (0.57)	7.8 (0.30)	8.0 (0.67)
Poland	29.9 (1.40)	25.6 (1.60)	35.2 (3.22)	33.2 (2.08)	25.5 (1.45)	17.9 (1.64)	28.7 *	27.5 *	29.0 (1.21)
Portugal	20.3 (1.06)	24.8 (1.95)	38.5 (5.51)	21.3 (1.29)	20.2 (1.12)	17.7 (2.21)	21.1 *	19.8 (1.07)	35.3 (3.34)
Slovak Republic	9.9 (0.43)	8.3 (0.61)	9.8 (1.05)	9.7 (0.52)	10.9 (0.53)	8.5 (0.45)	12.4 *	9.9 *	9.6 (0.37)
Slovenia	8.7 (0.23)	8.3 (0.34)	9.4 (0.54)	9.7 (0.49)	8.4 (0.25)	7.2 (0.26)	7.7 (0.22)	9.3 (0.31)	14.0 * (2.98)
Spain	26.7 (0.64)	24.2 (0.60)	29.4 (1.51)	25.7 (0.91)	26.8 (0.73)	23.0 (0.69)	23.8 *	22.1 (1.22)	26.2 (0.49)
EU (TALIS) average	16.5 (0.21)	16.2 (0.37)	20.5 (1.02)	18.3 (0.42)	16.9 (0.35)	13.8 (0.26)	16.4 (0.91)	16.1 (0.60)	18.3 (0.41)
Australia	9.0 (0.24)	9.0 (0.28)	9.0 (0.52)	8.9 (0.41)	9.1 (0.34)	9.1 (0.31)	9.8 *	8.7 (0.20)	10.6 (0.51)
Brazil	20.7 (0.88)	21.2 (1.02)	22.2 (1.51)	22.3 (1.15)	19.7 (0.85)	17.1 (1.40)	18.9 (2.00)	20.8 (0.87)	24.8 * (2.87)
Iceland	14.4 (0.68)	12.7 (0.83)	11.5 (1.41)	12.9 (0.84)	15.2 (0.96)	14.2 (0.99)	10.4 (0.79)	15.1 (0.74)	17.8 (2.41)
Korea	34.2 (0.69)	30.0 (0.91)	43.3 (1.61)	36.7 (1.01)	30.3 (0.82)	24.3 (1.51)	55.5 *	31.5 (0.65)	34.4 (0.82)
Malaysia	11.8 (0.39)	12.3 (0.44)	12.0 (0.56)	11.7 (0.43)	12.2 (0.37)	11.9 (0.65)	10.5 (0.65)	12.0 (0.34)	13.6 (0.76)
Mexico	39.9 (2.17)	33.9 (2.72)	48.5 (5.64)	41.8 (3.88)	34.5 (2.27)	28.1 (2.26)	27.4 (2.62)	36.4 (2.26)	53.1 (5.31)
Norway	10.9 (0.49)	10.1 (0.47)	10.2 (0.95)	10.4 (0.58)	12.6 (0.86)	9.7 (0.55)	16.0 *	9.9 (0.39)	12.7 (0.81)
Turkey	13.6 (0.82)	16.2 (1.29)	16.9 (1.13)	13.6 (0.74)	14.4 (1.91)	10.6 (1.18)	10.6 (1.07)	15.0 (0.76)	19.3 (2.95)
TALIS average	17.5 (0.18)	16.9 (0.29)	20.9 (0.72)	18.9 (0.34)	17.4 (0.28)	14.4 (0.23)	17.6 (0.80)	17.0 (0.41)	20.0 (0.41)

Note: * denotes categories that include less than 5% of teachers

Source: OECD, 2009, Table 3.1a

Table 4.2b. Amount of professional development undertaken by teachers in the previous 18 months (2007-08) - school characteristics

[among those teachers of lower secondary education who took some professional development]

Countries	Teachers by type of school				Teachers by size of the community in which the school is located									
	Teachers in public schools		Teachers in private schools		Teachers in schools in a village		Teachers in schools in a small town		Teachers in schools in a town		Teachers in schools in a city		Teachers in schools in a large city	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	11.0	(0.19)	10.2	(0.55)	11.3	(0.44)	10.2	(0.24)	12.1	(0.58)	11.2	(0.45)	11.3	(0.40)
Belgium (Fl.)	12.2	(1.31)	7.6	(0.34)	15.6	*	7.7	(0.46)	9.1	(0.86)	10.3	(0.88)	a	a
Bulgaria	30.9	(2.08)	20.5	*	27.5	(3.54)	32.9	(6.88)	32.1	(2.56)	30.6	(3.18)	30.2	(2.55)
Denmark	13.4	(0.49)	12.4	(0.99)	11.7	(0.98)	14.0	(1.45)	12.1	(0.77)	15.0	(1.37)	15.4	(1.74)
Estonia	14.2	(0.31)	14.9	*	13.9	(0.45)	14.1	(0.76)	14.8	(0.85)	14.3	(0.64)	a	a
Hungary	16.6	(0.50)	17.0	(0.81)	16.7	(1.17)	17.6	(1.06)	16.2	(1.04)	17.0	(0.91)	16.0	(0.81)
Ireland	6.4	(0.33)	5.7	(0.35)	5.9	(0.45)	5.9	(0.40)	6.2	(0.57)	6.7	(0.97)	5.9	(0.51)
Italy	30.8	(1.20)	44.5	*	30.4	(2.91)	33.0	(2.38)	29.5	(1.48)	29.2	(2.43)	35.3	(3.84)
Lithuania	11.8	(0.22)	11.4	*	10.9	(0.32)	11.7	(0.54)	12.3	(0.53)	12.2	(0.38)	a	a
Malta	7.5	(0.34)	8.2	(0.36)	8.6	(0.78)	7.9	(0.33)	7.6	(0.54)	a	a	a	a
Poland	29.0	(1.26)	27.9	(3.86)	26.5	(1.32)	31.7	(3.33)	28.1	(1.92)	29.7	(3.70)	45.1	*
Portugal	21.9	(1.22)	17.9	(1.49)	23.8	(2.18)	20.2	(2.00)	22.9	(1.74)	19.9	(3.23)	18.0	*
Slovak Republic	9.7	(0.39)	10.0	(1.19)	10.6	(1.07)	9.4	(0.66)	8.9	(0.46)	10.3	(1.19)	a	a
Slovenia	8.6	(0.21)	a	a	8.9	(0.42)	8.4	(0.29)	9.0	(0.63)	8.6	(0.73)	a	a
Spain	27.1	(0.62)	21.1	(0.79)	25.4	(1.50)	27.0	(0.88)	25.3	(0.86)	25.5	(1.28)	24.6	(1.18)
EU (TALIS) average	16.7	(0.23)	16.4	(0.95)	16.5	(0.48)	16.8	(0.57)	16.4	(0.31)	17.2	(0.50)	22.4	(1.06)
Australia	8.9	(0.24)	9.2	(0.32)	10.1	*	9.4	(0.74)	9.0	(0.35)	8.8	(0.40)	9.0	(0.32)
Brazil	21.1	(0.91)	19.0	(1.36)	22.8	(3.01)	19.5	(1.18)	20.2	(1.42)	21.3	(1.23)	20.2	(1.19)
Iceland	14.3	(0.65)	6.9	*	13.3	(0.71)	14.9	(1.21)	15.4	(1.37)	13.3	(1.09)	a	a
Korea	34.3	(0.76)	25.1	(1.29)	32.9	*	33.0	(2.12)	32.2	(1.58)	32.2	(1.43)	33.1	(0.94)
Malaysia	12.0	(0.33)	10.0	*	12.1	(0.60)	11.6	(0.47)	12.3	(0.96)	11.9	(1.04)	13.4	*
Mexico	35.3	(1.57)	44.0	(6.21)	30.6	(7.64)	38.6	(4.31)	35.6	(3.13)	32.2	(2.47)	38.4	(2.43)
Norway	10.7	(0.36)	7.1	*	11.8	(0.78)	10.4	(0.64)	10.6	(0.59)	8.7	(0.57)	a	a
Turkey	15.0	(0.72)	14.9	(1.13)	15.1	(2.42)	17.4	(3.05)	14.9	(1.48)	14.4	(0.83)	15.8	(1.32)
TALIS average	17.5	(0.18)	16.6	(0.69)	17.2	(0.50)	17.7	(0.46)	17.2	(0.28)	17.4	(0.36)	22.1	(0.67)

Note: * denotes categories that include less than 5% of teachers

Source: OECD, 2009, Table 3.1b

Table 4.2c. Amount of professional development undertaken by teachers in the previous 18 months (2007-08) - teacher subject characteristics

Average number of days and compulsory days of professional development (PD) undertaken by teachers in different subjects [among all teachers of lower secondary education in the indicated category]

Countries	Among teachers who teach a single subject				Among all teachers teaching the indicated subject ¹					
	Average days of PD across teachers in reading, writing and literature		Average days of PD across mathematics teachers		Average days of PD across science teachers		Average days of PD across mathematics teachers		Average days of PD across science teachers	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	8.4	(0.74)	9.0	(0.78)	7.6	(0.72)	11.0	(0.30)	10.9	(0.31)
Belgium (Fl)	7.3	(1.64)	5.2	(0.46)	6.5	(1.39)	8.3	(1.14)	6.3	(0.45)
Bulgaria	26.4	(3.28)	24.2	(3.36)	21.5	(1.80)	26.1	(3.74)	36.8	(5.88)
Denmark	13.9	(3.54)	7.3	(2.42)	7.1	(3.30)	9.7	(0.52)	9.1	(0.64)
Estonia	13.4	(0.71)	11.5	(0.85)	11.9	(0.75)	13.3	(0.60)	12.2	(0.72)
Hungary	16.4	(3.25)	12.0	(1.37)	10.4	(1.28)	16.3	(0.94)	16.0	(1.49)
Ireland	3.9	(0.38)	5.7	(0.77)	5.1	(0.40)	5.3	(0.37)	6.2	(0.54)
Italy	27.3	(2.56)	m	m	m	m	27.9	(1.34)	25.9	(1.91)
Lithuania	10.8	(0.41)	10.4	(0.64)	12.2	(0.78)	11.7	(0.43)	11.2	(0.55)
Malta	6.1	(0.35)	5.5	(0.45)	5.7	(0.55)	7.5	(0.42)	6.3	(0.60)
Poland	32.5	(4.77)	21.9	(3.52)	19.9	(1.74)	31.4	(2.53)	25.1	(2.83)
Portugal	17.8	(2.28)	15.1	(2.06)	23.5	(4.18)	16.5	(1.15)	16.6	(1.40)
Slovak Republic	5.7	(0.71)	5.7	(0.54)	6.5	(0.59)	6.5	(0.46)	8.1	(0.66)
Slovenia	7.9	(0.49)	7.7	(0.49)	8.3	(0.55)	8.5	(0.36)	8.5	(0.36)
Spain	26.0	(1.05)	23.5	(1.33)	26.5	(1.49)	26.3	(0.78)	26.0	(0.93)
EU (TALIS) average	14.9	(0.57)	11.8	(0.46)	12.3	(0.47)	15.1	(0.35)	15.0	(0.49)
Australia	8.1	(0.48)	7.7	(0.44)	7.9	(0.63)	8.8	(0.33)	8.9	(0.44)
Brazil	16.7	(1.24)	16.8	(1.43)	20.3	(2.04)	17.8	(1.01)	17.4	(1.03)
Iceland	14.8	(2.24)	15.1	(2.91)	8.5	(1.11)	12.0	(0.77)	12.2	(0.89)
Korea	30.6	(1.25)	27.0	(1.67)	31.5	(1.53)	31.6	(1.04)	28.9	(1.30)
Malaysia	10.7	(0.57)	12.1	(0.84)	11.9	(0.87)	10.4	(0.39)	11.3	(0.54)
Mexico	33.1	(4.49)	34.9	(4.61)	33.5	(4.73)	33.6	(2.40)	31.9	(2.69)
Norway	8.6	(2.05)	5.1	(0.98)	m	m	9.3	(0.47)	8.8	(0.46)
Turkey	11.7	(1.80)	9.9	(1.28)	11.1	(1.24)	10.3	(0.86)	11.2	(1.25)
TALIS average	15.6	(0.46)	13.3	(0.40)	14.2	(0.42)	15.7	(0.27)	15.5	(0.36)

¹ This includes teachers who, besides the indicated subject, also teach other subjects

Note: * denotes categories that include less than 5% of teachers

Source: OECD, TALIS Database

Table 4.3. Types of professional development undertaken by teachers (2007-08)

Percentage of teachers undertaking specified professional development activities in the previous 18 months

Countries	Courses and workshops		Education conferences and seminars		Qualification programmes		Observation visits to other schools		Professional development network		Individual and collaborative research		Mentoring and peer observation		Reading professional literature		Informal dialogue to improve teaching	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
Austria	91.9	(0.56)	49.2	(0.97)	19.9	(0.68)	10.3	(0.55)	37.6	(0.98)	25.9	(0.82)	18.4	(0.84)	89.4	(0.57)	91.9	(0.60)
Belgium (Fl.)	85.2	(0.89)	32.6	(1.33)	17.8	(0.83)	15.1	(1.06)	25.7	(1.05)	31.8	(0.87)	22.1	(0.92)	79.6	(0.98)	91.3	(0.71)
Bulgaria	73.7	(2.07)	42.2	(3.44)	50.2	(2.56)	22.5	(2.03)	19.8	(2.22)	24.5	(1.73)	35.4	(3.01)	93.5	(0.96)	94.7	(0.70)
Denmark	81.2	(1.33)	41.6	(1.56)	15.4	(1.47)	10.4	(0.92)	43.5	(1.65)	52.3	(1.51)	17.5	(1.66)	77.3	(1.50)	90.4	(0.89)
Estonia	92.5	(0.66)	50.6	(1.29)	27.7	(0.96)	62.8	(1.37)	42.8	(1.16)	26.6	(1.00)	31.5	(1.35)	87.7	(0.85)	93.8	(0.58)
Hungary	68.7	(1.66)	39.9	(1.64)	26.1	(1.13)	34.6	(2.15)	43.7	(1.83)	17.0	(0.84)	46.7	(1.93)	88.4	(1.11)	79.1	(1.39)
Ireland	85.7	(0.88)	42.0	(1.41)	11.4	(0.67)	7.6	(0.75)	51.1	(1.20)	26.3	(1.17)	18.2	(1.12)	60.3	(0.96)	87.4	(0.81)
Italy	66.3	(1.10)	43.5	(1.03)	10.8	(0.50)	16.0	(0.89)	20.1	(0.75)	56.5	(0.92)	27.4	(0.93)	66.2	(0.81)	93.1	(0.46)
Lithuania	95.7	(0.43)	67.6	(1.10)	43.9	(1.16)	57.1	(1.21)	37.6	(1.05)	48.1	(1.00)	39.7	(1.16)	93.5	(0.50)	96.7	(0.38)
Malta	90.2	(0.96)	51.8	(1.88)	18.1	(1.36)	14.8	(1.23)	39.0	(1.70)	37.4	(1.85)	16.5	(1.19)	61.1	(1.90)	92.3	(1.05)
Poland	90.8	(0.77)	64.3	(1.18)	35.0	(0.95)	19.7	(0.84)	60.7	(1.43)	40.0	(1.08)	66.7	(1.40)	95.2	(0.46)	95.8	(0.36)
Portugal	77.0	(0.91)	51.6	(1.31)	29.5	(0.87)	26.4	(1.03)	15.0	(0.82)	47.1	(1.15)	14.6	(0.84)	73.3	(0.97)	94.2	(0.49)
Slovak Republic	50.1	(1.45)	38.2	(1.38)	38.1	(1.28)	33.1	(1.41)	34.6	(1.46)	11.8	(0.83)	64.8	(1.27)	93.2	(0.64)	95.9	(0.48)
Slovenia	88.1	(0.70)	74.7	(1.05)	10.2	(0.65)	7.7	(0.58)	71.9	(1.38)	22.5	(0.97)	29.1	(0.87)	86.4	(0.73)	97.0	(0.35)
Spain	83.9	(0.86)	36.2	(1.10)	17.2	(0.62)	14.7	(0.75)	22.6	(0.84)	49.2	(0.96)	21.4	(1.01)	68.1	(0.93)	92.6	(0.49)
EU (TALIS) average	81.4	(0.28)	48.4	(0.40)	24.8	(0.30)	23.5	(0.31)	37.7	(0.35)	34.5	(0.30)	31.3	(0.36)	80.9	(0.26)	92.4	(0.18)
Australia	90.6	(0.81)	64.0	(1.34)	11.7	(0.80)	22.2	(1.42)	60.1	(1.38)	36.6	(1.21)	48.6	(1.30)	82.4	(1.09)	93.7	(0.70)
Brazil	80.3	(1.31)	61.0	(1.52)	40.8	(1.27)	32.5	(1.03)	21.9	(0.95)	54.7	(1.17)	47.5	(1.37)	82.5	(0.78)	94.2	(0.58)
Iceland	72.1	(1.30)	52.1	(1.25)	18.8	(1.02)	60.0	(1.27)	82.6	(1.11)	18.2	(1.08)	33.4	(1.16)	82.8	(1.05)	94.9	(0.65)
Korea	85.0	(0.86)	46.9	(1.24)	27.5	(0.88)	66.8	(1.26)	39.6	(1.00)	50.1	(1.03)	69.4	(1.15)	52.5	(1.06)	90.0	(0.63)
Malaysia	88.6	(0.71)	32.4	(0.93)	22.1	(1.01)	30.0	(1.40)	47.8	(1.25)	21.7	(1.08)	41.8	(1.26)	61.5	(1.63)	95.7	(0.36)
Mexico	94.3	(0.57)	33.1	(1.23)	33.5	(1.21)	30.5	(1.30)	27.5	(1.13)	62.9	(1.05)	38.1	(1.37)	67.4	(1.05)	88.9	(0.86)
Norway	72.5	(1.40)	40.4	(1.61)	17.6	(0.71)	19.1	(1.49)	35.3	(1.55)	12.3	(0.72)	22.0	(1.50)	64.1	(1.12)	94.0	(0.57)
Turkey	62.3	(1.51)	67.8	(1.99)	19.2	(1.09)	21.1	(1.66)	39.4	(1.67)	40.1	(1.35)	32.2	(2.15)	80.6	(2.14)	92.8	(0.82)
TALIS average	81.2	(0.23)	48.9	(0.32)	24.5	(0.23)	27.6	(0.26)	40.0	(0.28)	35.4	(0.24)	34.9	(0.30)	77.7	(0.23)	92.6	(0.14)

Source: OECD, 2009, Table 3.2

Table 4.3a. Correlations on the country level between types of professional development undertaken by teachers in the previous 18 months (2007-08)

Correlations for EU-TALIS countries only and for all TALIS countries

	Courses and workshops		Education conferences and seminars		Qualification programmes		Observation visits to other schools		Professional development network		Individual and collaborative research		Mentoring and peer observation		Reading professional literature		Informal dialogue to improve teaching		
	EU	All	EU	All	EU	All	EU	All	EU	All	EU	All	EU	All	EU	All	EU	All	
Courses and workshops			0.52	0.18	-0.16	-0.05	0.04	0.03	0.37	0.18	0.26	0.31	-0.37	-0.14	-0.05	-0.12	0.17	0.07	
Education conferences and seminars					0.12	0.03	0.17	0.08	0.61	0.42	0.08	0.10	0.18	0.16	0.32	0.42	0.50	0.41	
Qualification programmes							0.60	0.44	-0.23	-0.36	-0.20	0.10	0.58	0.48	0.69	0.46	0.30	0.18	
Observation visits to other schools									-0.10	0.14	-0.10	0.01	0.38	0.49	0.47	0.08	0.11	0.06	
Professional development network												-0.34	-0.43	0.29	0.21	0.24	0.18	-0.01	0.10
Individual and collaborative research														-0.38	-0.02	-0.43	-0.28	0.22	-0.02
Mentoring and peer observation															0.69	0.24	0.14	0.06	
Reading professional literature																	0.25	0.23	
Informal dialogue to improve teaching																			

Correlations between the four types of individual participation are shown in bold.

Source: OECD, TALIS Database

Not based on a table from the initial report

Table 4.4. Teachers who wanted to participate in more development than they did in the previous 18 months (2007-08) - teacher characteristics

Percentage of teachers of lower secondary education who wanted to take more professional development than they did in the previous 18 months, by certain teacher and school characteristics

Countries	All teachers		Female teachers		Male teachers		Teachers aged under 40 years		Teachers aged 40+ years		Teachers with qualification below ISCED level 5A		Teachers with qualification at ISCED level 5A bachelor's degree		Teachers with qualification at ISCED level 5A master's degree or doctorate		Teachers in public schools		Teachers in private schools		
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	
Austria	44.7	(0.93)	46.0	(1.17)	41.9	(1.36)	48.8	(1.83)	43.5	(1.00)	40.3	(1.18)	41.8	*	51.9	(1.43)	43.9	(1.01)	53.4	(2.05)	
Belgium (Fl)	30.5	(0.98)	32.3	(1.40)	26.5	(2.50)	34.9	(1.22)	25.6	(1.34)	30.4	(1.02)	23.0	*	36.0	(3.04)	32.7	(1.17)	29.7	(1.36)	
Bulgaria	68.9	(1.77)	69.5	(1.62)	65.8	(4.77)	70.9	(2.83)	68.0	(1.87)	67.6	(4.25)	71.6	(3.98)	68.5	(2.33)	68.9	(1.78)	64.5	*	(12.29)
Denmark	47.6	(1.39)	49.6	(1.93)	44.8	(2.50)	47.3	(2.41)	47.8	(1.90)	18.0	*	47.8	(1.37)	52.9	(5.58)	48.0	(1.80)	45.8	(3.01)	
Estonia	48.7	(1.07)	48.6	(1.16)	49.2	(2.38)	48.3	(1.90)	48.8	(1.26)	48.7	(2.89)	49.8	(1.74)	47.8	(1.49)	48.6	(1.10)	50.4	*	(9.40)
Hungary	40.2	(2.00)	39.9	(2.45)	41.0	(2.10)	41.1	(3.19)	39.6	(1.81)	39.3	*	38.6	(2.07)	44.6	(2.22)	40.1	(1.63)	40.3	(5.22)	
Ireland	54.1	(1.37)	55.7	(1.54)	50.7	(2.56)	54.8	(1.87)	53.5	(1.61)	46.5	*	54.6	(1.45)	53.6	(2.85)	53.6	(2.28)	53.8	(1.81)	
Italy	56.4	(0.98)	58.4	(1.08)	49.2	(1.78)	57.0	(1.85)	56.2	(1.07)	54.0	(2.38)	62.9	(3.09)	56.1	(1.07)	56.5	(1.03)	48.5	(5.20)	
Lithuania	44.7	(1.10)	45.4	(1.12)	40.9	(2.80)	47.9	(1.79)	43.3	(1.28)	44.0	(2.18)	45.2	(1.40)	44.2	(1.84)	45.0	(1.10)	31.6	(6.43)	
Malta	43.3	(1.79)	44.4	(2.33)	41.4	(3.10)	42.5	(2.22)	44.6	(3.04)	40.5	(4.26)	43.3	(1.99)	48.0	(5.52)	41.1	(2.44)	47.7	(2.04)	
Poland	43.6	(1.04)	45.1	(1.28)	38.9	(2.07)	49.5	(1.54)	37.3	(1.26)	40.7	*	47.5	*	43.3	(1.07)	43.5	(1.01)	45.2	(7.26)	
Portugal	76.2	(0.91)	77.5	(1.04)	73.1	(1.56)	77.3	(1.22)	75.1	(1.43)	70.7	*	76.0	(0.99)	79.8	(2.52)	77.0	(0.98)	66.0	(3.51)	
Slovak Republic	43.2	(1.34)	44.3	(1.37)	38.6	(2.98)	48.4	(1.90)	39.6	(1.78)	38.4	*	47.3	*	43.6	(1.40)	42.6	(1.35)	46.3	(3.89)	
Slovenia	35.1	(1.18)	34.9	(1.23)	36.0	(2.38)	39.5	(1.82)	32.2	(1.36)	28.8	(1.48)	40.7	(1.50)	36.0	*	34.9	(1.14)	a	a	
Spain	60.6	(1.02)	63.8	(1.28)	56.4	(1.43)	68.6	(1.59)	56.0	(1.29)	47.6	*	56.5	(2.53)	62.0	(1.16)	60.6	(1.23)	59.5	(2.31)	
EU (TALIS) average	49.2	(0.34)	50.3	(0.39)	46.3	(0.66)	51.8	(0.52)	47.4	(0.42)	43.7	(1.69)	49.8	(1.28)	51.2	(0.88)	49.1	(0.38)	48.8	(1.50)	
Australia	55.2	(1.37)	57.9	(1.67)	51.3	(1.89)	59.0	(1.70)	52.5	(1.70)	24.6	*	55.1	(1.37)	58.9	(2.83)	55.5	(1.49)	54.8	(2.49)	
Brazil	84.4	(0.77)	85.9	(0.88)	80.5	(1.30)	85.8	(1.05)	82.6	(1.21)	86.4	(2.41)	83.9	(0.85)	83.3	*	84.8	(0.89)	83.6	(1.52)	
Iceland	37.9	(1.47)	40.6	(1.93)	32.0	(2.36)	36.3	(2.23)	39.0	(1.84)	36.5	(2.33)	39.4	(1.80)	32.9	(5.74)	37.5	(1.61)	35.0	(12.03)	
Korea	58.2	(1.16)	60.5	(1.28)	54.1	(1.92)	67.6	(1.57)	52.5	(1.53)	68.1	*	58.5	(1.42)	57.6	(1.72)	59.6	(1.41)	50.8	(3.98)	
Malaysia	82.9	(0.95)	83.8	(1.10)	81.1	(1.30)	86.5	(1.12)	77.3	(1.28)	75.0	(2.21)	83.9	(1.05)	85.8	(2.12)	83.0	(0.97)	66.9	(11.42)	
Mexico	85.3	(0.85)	86.3	(1.04)	84.1	(1.15)	88.0	(1.04)	83.3	(1.15)	80.8	(3.10)	86.1	(0.88)	86.6	(2.15)	85.7	(0.80)	84.8	(3.28)	
Norway	70.3	(1.13)	72.5	(1.43)	67.1	(1.76)	70.3	(1.72)	70.4	(1.45)	52.6	*	71.1	(1.36)	68.6	(2.11)	70.6	(1.16)	72.9	(8.17)	
Turkey	48.2	(2.21)	51.3	(2.13)	44.8	(3.22)	51.2	(2.40)	37.2	(3.56)	26.2	(5.62)	48.8	(2.23)	58.8	(6.69)	48.4	(2.51)	41.6	(3.71)	
TALIS average	54.8	(0.27)	56.3	(0.32)	51.7	(0.49)	57.5	(0.40)	52.4	(0.36)	48.1	(1.47)	55.4	(0.85)	56.6	(0.74)	54.9	(0.31)	53.3	(1.31)	

Note: * denotes categories that include less than 5% of teachers

Source: OECD, 2009, Table 3.3

Table 4.4a. Teachers who wanted to participate in more development than they did in the previous 18 months (2007-08) - teacher subjects

Percentages for teachers in different subjects

	Teachers who teach a single subject						All teachers teaching the indicated subject ¹								
	Percentage of teachers who wanted more PD than they received across teachers in reading, writing and literature		Percentage of teachers who wanted more PD than they received across mathematics teachers		Percentage of teachers who wanted more PD than they received across science teachers		Percentage of teachers who wanted more PD than they received across teachers in reading, writing and literature		Percentage of teachers who wanted more PD than they received across mathematics teachers		Percentage of teachers who wanted more PD than they received across science teachers				
Countries	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)			
Austria	50.7	*	(5.51)	46.6	*	(6.05)	55.0	*	(4.34)	42.4	(1.59)	44.6	(1.76)	44.1	(1.70)
Belgium (Fl.)	32.4		(3.83)	22.1		(2.99)	30.4	*	(5.18)	34.4	(2.03)	22.9	(1.94)	30.9	(2.53)
Bulgaria	71.0		(3.74)	67.6		(4.52)	67.3		(2.77)	66.3	(2.95)	73.9	(3.39)	69.2	(4.18)
Denmark	21.2	*	(8.51)	29.7	*	(12.09)	50.8	*	(7.53)	46.8	(2.39)	47.1	(2.72)	52.0	(2.29)
Estonia	55.1		(3.00)	34.5		(3.83)	48.5		(3.19)	52.6	(2.52)	41.6	(3.01)	49.0	(2.03)
Hungary	26.5		(4.84)	43.9	*	(6.46)	36.6		(3.90)	32.6	(3.39)	38.9	(2.27)	38.9	(2.84)
Ireland	53.2		(4.26)	42.7		(4.71)	45.8		(5.28)	59.7	(1.79)	47.8	(2.68)	46.3	(3.60)
Italy	54.5		(2.23)	m		m	m		m	56.2	(1.30)	53.5	(2.02)	54.3	(1.87)
Lithuania	44.4		(2.95)	32.6		(3.55)	42.7		(3.74)	46.8	(1.66)	40.5	(2.63)	45.8	(2.19)
Malta	40.9		(4.10)	36.3		(5.57)	35.0		(5.75)	42.8	(2.92)	38.4	(3.86)	45.5	(3.96)
Poland	42.8		(3.69)	42.8		(3.66)	38.7		(3.65)	43.6	(2.79)	42.3	(2.49)	41.9	(2.60)
Portugal	83.3		(2.84)	64.4		(3.37)	76.0		(2.72)	74.7	(2.08)	69.3	(2.44)	76.6	(1.98)
Slovak Re-public	35.1	*	(4.90)	44.4	*	(6.19)	34.0		(4.75)	44.6	(2.79)	43.2	(2.52)	39.8	(2.35)
Slovenia	36.1		(2.84)	26.6		(3.13)	25.9		(3.32)	35.1	(1.96)	28.2	(2.03)	28.6	(1.91)
Spain	59.6		(2.67)	54.9		(3.39)	61.0		(3.36)	60.1	(1.95)	55.6	(2.08)	59.0	(2.32)
EU (TALIS) average	47.1		(1.10)	42.1		(1.46)	46.3		(1.19)	49.2	(0.61)	45.8	(0.67)	48.1	(0.69)
Australia	62.2		(4.79)	36.7		(4.16)	60.2		(4.87)	57.0	(1.89)	52.0	(2.28)	64.6	(2.49)
Brazil	84.9		(1.91)	78.4		(1.92)	84.7		(2.33)	87.0	(1.40)	82.1	(1.37)	85.7	(1.50)
Iceland	33.3		(5.94)	28.0		(5.69)	36.6	*	(8.73)	42.2	(3.25)	40.2	(2.91)	43.4	(3.65)
Korea	61.9		(2.40)	53.6		(2.89)	54.7		(2.93)	61.4	(1.82)	56.6	(1.92)	58.2	(2.24)
Malaysia	85.4		(2.10)	83.5		(2.70)	76.2		(3.15)	83.1	(1.19)	80.6	(1.81)	79.3	(1.78)
Mexico	85.6		(2.93)	85.2		(2.84)	84.2		(2.24)	86.1	(1.06)	85.0	(1.31)	85.4	(1.09)
Norway	61.7	*	(6.84)	44.1	*	(10.63)	m		m	73.1	(1.62)	66.8	(1.69)	67.3	(1.88)
Turkey	48.4		(5.70)	36.2		(5.69)	44.9		(5.82)	48.5	(3.11)	45.0	(3.36)	47.5	(3.80)
TALIS average	53.5		(0.90)	47.0		(1.15)	51.9		(1.00)	55.5	(0.47)	52.0	(0.51)	54.5	(0.54)

¹ This includes teachers who, besides the indicated subject, also teach other subjects

Note: * denotes categories that include less than 5% of teachers

Source: OECD, TALIS Database

Table 4.5. Teachers' high professional development needs (2007-08)

Percentage of teachers of lower secondary education indicating they have a "high level of need" for professional development in the following areas and overall index of need

Countries	Overall index of development need (maximum=100) ¹		Content and performance standards		Student assessment practices		Classroom management		Subject field		Instructional practices		ICT teaching skills		Teaching special learning needs students		Student discipline and behaviour problems		School management and administration		Teaching in a multicultural setting		Student counselling	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	50.7	(0.31)	13.9	(0.69)	12.2	(0.53)	13.6	(0.64)	14.8	(0.59)	18.6	(0.75)	23.8	(0.64)	30.3	(0.94)	32.6	(1.03)	3.9	(0.37)	10.0	(0.68)	13.1	(0.65)
Belgium (Fl)	47.0	(0.39)	12.0	(0.65)	15.6	(0.74)	12.1	(0.59)	17.5	(0.74)	14.1	(0.77)	14.8	(0.72)	12.8	(0.76)	11.8	(0.71)	2.4	(0.31)	3.7	(0.46)	11.0	(0.68)
Bulgaria	49.6	(0.59)	25.7	(2.33)	16.1	(1.45)	12.7	(1.46)	21.2	(1.53)	18.3	(1.67)	26.9	(1.58)	24.4	(1.47)	14.9	(1.82)	8.5	(0.95)	15.5	(2.35)	10.4	(1.30)
Denmark	44.4	(0.59)	17.1	(1.25)	13.6	(0.97)	2.3	(0.55)	4.6	(0.54)	4.7	(0.57)	20.1	(1.67)	24.6	(1.44)	9.8	(1.21)	3.9	(0.49)	7.1	(0.98)	5.5	(0.66)
Estonia	55.3	(0.49)	17.7	(0.95)	10.4	(0.65)	13.4	(0.76)	22.6	(1.01)	18.2	(0.78)	27.9	(0.91)	28.1	(0.95)	23.6	(1.02)	4.6	(0.37)	9.7	(0.77)	21.5	(0.95)
Hungary	44.7	(0.51)	9.2	(0.55)	5.9	(0.51)	3.3	(0.36)	7.4	(0.64)	14.7	(0.81)	23.0	(1.15)	42.0	(1.57)	31.2	(1.50)	3.4	(0.96)	10.7	(0.68)	8.4	(0.83)
Ireland	48.6	(0.48)	6.7	(0.52)	8.2	(0.77)	6.4	(0.59)	4.1	(0.49)	5.4	(0.60)	34.2	(1.30)	38.3	(1.32)	13.9	(0.98)	11.8	(0.94)	24.3	(1.31)	24.9	(1.33)
Italy	62.7	(0.30)	17.6	(0.69)	24.0	(0.83)	18.9	(0.84)	34.0	(0.75)	34.9	(0.89)	25.8	(0.81)	35.3	(1.05)	28.3	(1.04)	8.6	(0.49)	25.3	(0.85)	19.7	(0.87)
Lithuania	62.0	(0.41)	39.2	(1.01)	37.3	(1.03)	27.9	(0.96)	43.4	(0.89)	44.5	(0.90)	36.1	(0.93)	25.4	(0.95)	24.3	(0.89)	9.8	(0.68)	9.8	(0.79)	18.6	(1.09)
Malta	47.5	(0.57)	8.1	(1.00)	7.2	(0.82)	5.3	(0.78)	6.7	(0.86)	3.9	(0.60)	22.8	(1.51)	34.4	(1.56)	10.5	(1.18)	12.9	(1.31)	14.0	(1.36)	15.8	(1.29)
Poland	49.1	(0.50)	11.9	(0.74)	12.8	(0.77)	17.6	(0.95)	17.0	(0.87)	17.5	(0.75)	22.2	(0.90)	29.4	(1.28)	23.5	(0.94)	7.8	(0.57)	6.6	(0.58)	25.4	(1.01)
Portugal	55.9	(0.31)	9.8	(0.62)	6.9	(0.51)	5.8	(0.47)	4.8	(0.43)	7.7	(0.54)	24.2	(0.89)	50.0	(1.06)	17.4	(0.88)	18.2	(0.90)	17.0	(0.73)	8.5	(0.61)
Slovak Republic	48.2	(0.56)	8.2	(0.66)	9.0	(0.57)	9.8	(0.81)	17.2	(0.96)	13.4	(0.89)	14.8	(0.97)	20.1	(0.97)	19.2	(1.26)	4.8	(0.46)	4.6	(0.52)	7.9	(0.58)
Slovenia	57.3	(0.35)	13.4	(0.67)	22.3	(0.89)	24.0	(0.79)	15.9	(0.78)	19.9	(0.80)	25.1	(0.81)	40.4	(1.09)	32.0	(1.04)	7.0	(0.59)	9.9	(0.68)	21.1	(0.83)
Spain	48.8	(0.44)	6.0	(0.38)	5.8	(0.42)	8.1	(0.57)	5.0	(0.47)	5.5	(0.39)	26.2	(1.08)	35.8	(1.04)	18.3	(0.76)	14.2	(0.64)	17.5	(0.73)	12.0	(0.62)
EU (TALIS) average	51.5	(0.12)	14.4	(0.25)	13.8	(0.21)	12.1	(0.20)	15.7	(0.21)	16.1	(0.21)	24.5	(0.28)	31.4	(0.31)	20.8	(0.29)	8.1	(0.19)	12.4	(0.26)	14.9	(0.24)
Australia	44.2	(0.35)	8.3	(0.64)	7.5	(0.60)	5.2	(0.52)	5.0	(0.53)	3.6	(0.40)	17.8	(0.94)	15.1	(0.98)	6.6	(0.71)	5.9	(0.53)	4.1	(0.43)	7.3	(0.61)
Brazil	58.0	(0.55)	23.1	(1.31)	21.1	(1.15)	13.7	(0.98)	14.9	(1.06)	14.8	(1.06)	35.6	(1.33)	63.2	(1.21)	26.5	(1.12)	20.0	(0.78)	33.2	(1.22)	20.7	(1.14)
Iceland	51.5	(0.48)	7.3	(0.74)	14.3	(1.00)	11.6	(0.90)	10.3	(0.91)	8.2	(0.76)	17.3	(1.08)	23.2	(1.16)	20.0	(0.97)	7.9	(0.84)	14.0	(0.92)	12.9	(0.86)
Korea	69.9	(0.30)	26.8	(0.92)	21.5	(0.79)	30.3	(0.91)	38.3	(0.96)	39.9	(0.91)	17.7	(0.67)	25.6	(0.88)	34.6	(0.92)	10.8	(0.62)	10.4	(0.61)	41.5	(1.04)
Malaysia	72.5	(0.64)	49.8	(1.59)	43.8	(1.43)	41.6	(1.41)	56.8	(1.53)	55.2	(1.47)	43.8	(1.18)	25.9	(1.08)	41.6	(1.41)	29.9	(1.14)	30.3	(1.35)	35.1	(1.21)
Mexico	50.2	(0.59)	13.7	(0.77)	15.0	(0.83)	8.8	(0.66)	11.0	(0.88)	12.3	(0.92)	24.9	(1.09)	38.8	(1.27)	21.4	(1.04)	11.9	(0.71)	18.2	(0.93)	25.9	(1.12)
Norway	55.3	(0.51)	12.9	(0.85)	21.9	(1.29)	7.7	(0.66)	8.6	(0.70)	8.2	(0.61)	28.1	(1.19)	29.2	(1.04)	16.5	(0.93)	5.8	(0.57)	8.3	(0.75)	7.8	(0.63)
Turkey	42.7	(0.72)	9.8	(0.81)	9.2	(0.90)	6.7	(1.29)	8.9	(0.93)	9.0	(0.92)	14.2	(0.85)	27.8	(1.70)	13.4	(1.44)	9.3	(0.78)	14.5	(1.10)	9.5	(1.16)
TALIS average	52.9	(0.10)	16.0	(0.20)	15.7	(0.19)	13.3	(0.18)	17.0	(0.18)	17.1	(0.18)	24.7	(0.23)	31.3	(0.25)	21.4	(0.23)	9.7	(0.15)	13.9	(0.21)	16.7	(0.20)

Note: ¹ Index derived from aggregating the development need for each teacher over all of the aspects of their work: 3 points for a high level of need; 2 points for a moderate level of need, 1 point for a low level of need and no points for cases where teachers noted no development need at all. These were then aggregated and divided by the maximum possible score of 33 and multiplied by 100.

Source: OECD, 2009, Table 3.4

Table 4.5a. Index of professional development need among teachers (2007-08) - teacher subjects

Index of professional development need among teachers in different subjects

Countries	Teachers who teach a single subject						All teachers teaching the indicated subject ¹								
	Teachers in reading, writing and literature		Mathematics teachers		Science teachers		Teachers in reading, writing and literature		Mathematics teachers		Science teachers				
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)			
Austria	50.9	*	(1.94)	48.5	*	(1.82)	48.8	*	(1.72)	51.5	(0.54)	50.4	(0.51)	51.2	(0.50)
Belgium (Fl.)	45.5		(1.37)	45.7		(1.04)	44.0	*	(2.45)	47.4	(0.81)	46.8	(0.87)	46.1	(1.17)
Bulgaria	51.4		(1.46)	45.4		(2.30)	49.8		(1.52)	52.1	(1.44)	47.4	(1.58)	52.0	(1.55)
Denmark	41.4	*	(2.81)	41.4	*	(3.16)	43.1	*	(2.59)	43.8	(0.78)	45.0	(1.10)	45.1	(1.14)
Estonia	56.3		(1.10)	49.5		(1.18)	52.1		(1.25)	57.1	(0.79)	52.8	(0.93)	54.6	(0.96)
Hungary	43.9		(1.99)	43.6	*	(1.73)	41.1		(2.42)	45.5	(0.99)	45.6	(1.18)	45.2	(0.95)
Ireland	48.2		(1.30)	42.8		(1.82)	48.5		(2.00)	49.5	(0.81)	47.8	(0.89)	49.0	(1.10)
Italy	61.7		(1.27)	m		m	m		m	63.1	(0.51)	62.5	(0.64)	62.6	(0.64)
Lithuania	63.7		(0.85)	56.4		(0.93)	61.2		(1.24)	64.5	(0.70)	60.0	(0.76)	62.8	(0.76)
Malta	47.5		(1.34)	45.8		(2.13)	44.4		(2.01)	49.2	(0.84)	44.2	(1.52)	45.1	(1.50)
Poland	51.4		(1.50)	44.9		(1.26)	47.7		(1.16)	51.6	(0.93)	46.0	(0.97)	47.8	(0.91)
Portugal	58.8		(1.18)	55.3		(0.90)	55.9		(0.96)	58.4	(0.76)	55.7	(0.71)	55.8	(0.68)
Slovak Republic	46.2	*	(2.74)	50.2	*	(2.49)	49.0		(1.39)	48.4	(0.92)	49.5	(0.75)	48.5	(0.75)
Slovenia	60.0		(0.90)	55.2		(1.21)	54.9		(1.35)	59.6	(0.63)	55.0	(0.75)	55.9	(0.69)
Spain	49.9		(0.68)	45.0		(1.37)	48.9		(1.08)	50.0	(0.66)	47.2	(0.93)	48.9	(0.88)
EU (TALIS) average	51.8		(0.42)	47.8		(0.48)	49.2		(0.46)	52.8	(0.22)	50.4	(0.25)	51.4	(0.26)
Australia	46.2		(1.37)	39.3		(1.22)	42.9		(1.09)	45.9	(0.72)	41.7	(0.72)	44.5	(0.76)
Brazil	59.1		(1.17)	57.0		(1.28)	56.8		(1.35)	59.8	(0.78)	57.4	(1.04)	56.9	(0.99)
Iceland	55.1		(2.23)	51.2		(2.37)	50.4	*	(2.63)	54.1	(0.89)	53.0	(0.95)	52.3	(1.09)
Korea	69.6		(0.68)	69.3		(0.75)	71.7		(0.89)	69.4	(0.57)	69.2	(0.61)	70.4	(0.71)
Malaysia	70.7		(1.47)	70.2		(1.58)	71.2		(1.25)	72.7	(0.82)	71.7	(0.89)	72.3	(0.80)
Mexico	47.7		(2.07)	48.1		(1.79)	50.2		(1.70)	50.1	(0.87)	51.0	(0.94)	50.0	(0.91)
Norway	57.4	*	(2.19)	49.4	*	(2.85)	m		m	57.0	(0.67)	53.6	(0.68)	53.6	(0.84)
Turkey	42.3		(2.25)	40.2		(2.61)	36.3		(2.04)	41.6	(1.28)	40.2	(1.45)	38.5	(1.68)
TALIS average	53.3		(0.35)	49.7		(0.39)	50.9		(0.37)	54.0	(0.18)	51.9	(0.20)	52.6	(0.21)

¹ This includes teachers who, besides the indicated subject, also teach other subjects

Note: * denotes categories that include less than 5% of teachers

Source: OECD, TALIS Database

Table 4.5b. Percentage of moderate or high need for professional development in some areas for teachers in different subjects (2007-08)

Only for teachers who teach a single subject

Countries	Knowledge and understanding of main subject field(s)						Knowledge and understanding of instructional practices in main subject field(s)											
	Teachers in reading, writing and literature		Mathematics teachers		Science teachers		Teachers in reading, writing and literature		Mathematics teachers		Science teachers							
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)				
Austria	52.4	*	(5.81)	43.2	*	(6.33)	70.1	*	(5.55)	69.4	*	(5.23)	69.5	*	(5.44)	63.0	*	(5.75)
Belgium (Fl.)	51.2		(3.81)	42.1		(2.90)	53.8	*	(5.52)	54.9		(3.35)	49.9		(3.29)	53.1	*	(5.26)
Bulgaria	49.9		(4.09)	38.4		(5.89)	49.7		(3.40)	46.2		(4.31)	44.1		(6.94)	46.6		(2.74)
Denmark	35.9	*	(13.41)	13.9	*	(7.50)	36.9	*	(7.98)	36.0	*	(13.51)	38.2	*	(10.01)	37.0	*	(8.52)
Estonia	68.9		(2.75)	34.2		(3.37)	63.0		(3.40)	69.2		(2.67)	52.3		(3.31)	62.5		(3.94)
Hungary	26.4		(5.19)	18.2	*	(4.11)	19.9		(3.71)	46.8		(9.16)	53.1	*	(6.86)	34.7		(4.43)
Ireland	21.0		(3.10)	10.5		(3.16)	11.7		(3.41)	29.4		(3.02)	28.2		(4.92)	33.8		(4.81)
Italy	69.8		(2.67)	m		m	m		m	75.1		(2.33)	m		m	m		m
Lithuania	83.2		(2.25)	64.8		(3.48)	81.1		(2.39)	90.4		(1.53)	76.0		(3.42)	87.7		(2.04)
Malta	18.4		(3.66)	13.3		(3.92)	14.5		(4.11)	24.1		(3.91)	24.5		(5.16)	16.3		(4.83)
Poland	41.9		(3.48)	27.8		(3.12)	37.8		(2.58)	57.5		(3.42)	51.0		(3.55)	51.7		(3.34)
Portugal	47.1		(3.60)	29.1		(2.91)	51.7		(3.13)	76.4		(3.44)	63.7		(3.35)	62.1		(3.11)
Slovak Republic	55.4	*	(6.07)	42.4	*	(6.26)	57.1		(4.41)	53.0	*	(5.91)	61.5	*	(5.65)	60.6		(4.31)
Slovenia	53.1		(2.99)	35.9		(3.33)	49.8		(3.96)	75.0		(2.59)	57.9		(3.42)	59.7		(3.82)
Spain	17.4		(1.91)	10.0		(1.78)	16.9		(2.51)	39.0		(2.29)	33.1		(3.11)	40.4		(3.14)
EU (TALIS) average	46.1		(1.32)	30.3		(1.19)	43.9		(1.14)	56.2		(1.39)	50.2		(1.31)	50.7		(1.14)
Australia	26.4		(4.20)	11.2		(2.72)	23.4		(3.48)	27.3		(3.77)	17.0		(3.26)	27.9		(3.26)
Brazil	43.5		(2.73)	41.6		(2.81)	45.8		(3.09)	52.0		(2.54)	46.6		(3.08)	50.3		(2.89)
Iceland	44.1		(6.27)	42.5		(5.53)	45.8	*	(8.80)	48.8		(6.06)	46.0		(5.53)	40.9	*	(7.57)
Korea	87.1		(1.70)	88.8		(1.75)	88.2		(1.82)	91.8		(1.36)	92.6		(1.52)	92.1		(1.64)
Malaysia	76.5		(2.59)	75.2		(3.34)	81.4		(2.71)	78.0		(2.58)	79.4		(3.18)	82.9		(2.47)
Mexico	24.6		(3.83)	22.4		(3.37)	24.9		(2.96)	35.0		(3.89)	40.1		(4.29)	37.6		(3.52)
Norway	67.7	*	(7.92)	56.8	*	(11.93)	m		m	58.9	*	(11.49)	48.2	*	(11.25)	m		m
Turkey	28.5		(6.68)	18.9		(4.38)	25.2		(4.94)	33.9		(6.18)	27.3		(5.82)	18.2		(4.47)
TALIS average	47.4		(1.05)	35.5		(1.03)	45.2		(0.95)	55.1		(1.14)	50.0		(1.09)	50.4		(0.88)

Note: * denotes categories that include less than 5% of teachers

Source: OECD, TALIS Database

Table 4.5b (continued). Percentage of moderate or high need for professional development in some areas for teachers in different subjects (2007-08)

Only for teachers who teach a single subject

Countries	Content and performance standards in main subject field(s)						ICT skills for learning											
	Teachers in reading, writing and literature		Mathematics teachers		Science teachers		Teachers in reading, writing and literature		Mathematics teachers		Science teachers							
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)						
Austria	65.0	*	(5.89)	61.8	*	(6.70)	53.6	*	(5.30)	58.7	*	(6.64)	59.0	*	(5.19)	67.5	*	(4.44)
Belgium (Fl.)	57.5		(3.78)	47.2		(2.97)	49.0	*	(5.80)	56.1		(4.05)	71.8		(3.43)	51.4	*	(5.26)
Bulgaria	70.2		(3.91)	66.1		(5.03)	72.4		(3.78)	69.4		(4.35)	76.0		(3.94)	73.9		(4.82)
Denmark	69.5	*	(10.90)	68.7	*	(9.95)	80.4	*	(8.89)	70.3	*	(10.08)	73.9	*	(7.44)	64.0	*	(14.17)
Estonia	67.4		(3.18)	50.8		(3.82)	60.8		(3.43)	84.3		(2.30)	80.9		(3.09)	71.3		(3.22)
Hungary	40.3		(3.78)	36.2	*	(8.70)	36.6		(6.48)	46.8		(3.73)	52.1	*	(6.66)	56.2		(7.58)
Ireland	43.5		(3.85)	27.0		(3.85)	25.7		(4.06)	73.3		(4.01)	63.1		(5.96)	62.4		(4.94)
Italy	69.5		(2.50)	71.5		(12.07)	m		m	72.8		(2.42)	77.3		(12.21)	m		m
Lithuania	90.2		(1.69)	74.8		(3.13)	83.1		(2.15)	80.9		(2.07)	83.7		(2.44)	88.1		(2.13)
Malta	35.0		(4.18)	40.1		(5.73)	34.1		(5.57)	71.9		(3.70)	63.7		(5.43)	60.0		(5.25)
Poland	55.0		(3.24)	41.2		(3.34)	47.3		(3.23)	67.1		(3.03)	60.8		(3.17)	65.7		(2.76)
Portugal	80.3		(3.02)	66.3		(2.88)	67.8		(2.49)	86.4		(2.46)	73.5		(3.21)	72.7		(2.64)
Slovak Republic	47.4	*	(6.70)	57.7	*	(5.80)	48.4		(5.55)	57.7	*	(5.79)	60.0	*	(6.50)	75.6		(3.28)
Slovenia	73.9		(2.20)	64.0		(3.38)	66.3		(3.37)	72.2		(2.59)	68.3		(3.60)	67.7		(3.52)
Spain	34.6		(2.79)	26.9		(2.93)	33.8		(3.32)	80.9		(2.02)	61.0		(3.62)	72.2		(2.75)
EU (TALIS) average	60.0		(1.20)	53.3		(1.67)	54.2		(1.30)	69.9		(1.15)	68.3		(1.45)	67.8		(1.40)
Australia	52.2		(4.62)	29.4		(4.14)	39.2		(4.80)	67.7		(4.38)	61.0		(3.27)	64.2		(3.49)
Brazil	62.6		(2.71)	56.7		(3.01)	60.8		(3.09)	76.1		(2.06)	72.4		(2.57)	70.5		(2.66)
Iceland	62.6		(6.48)	48.4		(5.67)	44.2	*	(8.26)	64.1		(5.76)	54.7		(6.23)	47.4	*	(7.77)
Korea	90.0		(1.49)	88.9		(1.79)	89.6		(1.69)	77.5		(1.94)	79.8		(2.57)	82.7		(2.42)
Malaysia	84.6		(2.21)	82.8		(3.00)	87.0		(2.32)	89.7		(1.67)	88.1		(2.00)	86.4		(2.21)
Mexico	46.4		(3.95)	44.3		(3.68)	49.8		(4.08)	62.9		(4.02)	64.6		(4.06)	57.5		(3.50)
Norway	87.7	*	(5.98)	75.1	*	(9.97)	m		m	80.2	*	(8.01)	81.2	*	(7.37)	m		m
Turkey	46.9		(5.93)	36.1		(7.44)	28.5		(4.22)	54.0		(5.74)	50.0		(6.02)	45.8		(4.80)
TALIS average	62.3		(0.96)	54.9		(1.27)	55.2		(1.04)	70.5		(0.95)	68.6		(1.10)	66.8		(1.03)

Note: * denotes categories that include less than 5% of teachers

Source: OECD, TALIS Database

Table 4.6. Amount of professional development undertaken by teachers in the previous 18 months (2007-08) - in relation to wish and offer

Average number of days of professional development in relation to the wish to participate in more professional development and the suitability of professional development offered

Countries	Do teachers want to participate in more professional development?				Teachers who wanted to participate in more professional development				
	Yes		No		“No suitable professional development offered” checked		“No suitable professional development offered” not checked		
	Mean	(SE)	Mean	#	(SE)	Mean	(SE)	Mean	(SE)
Austria	9.7	(0.20)	11.2	#	(0.25)	9.2	(0.24)	10.4	(0.43)
Belgium (Fl.)	7.7	(0.53)	8.1		(0.49)	6.4	(0.52)	8.3	(0.79)
Bulgaria	28.4	(2.16)	24.4		(2.08)	23.3	(1.98)	33.0	(3.21)
Denmark	9.2	(0.44)	10.3		(0.56)	8.5	(0.74)	9.7	(0.64)
Estonia	12.3	(0.40)	14.0	#	(0.39)	11.6	(0.54)	13.1	(0.60)
Hungary	12.1	(0.51)	16.1	#	(0.62)	9.6	(0.98)	13.0	(0.63)
Ireland	5.2	(0.26)	6.1	#	(0.32)	4.1	(0.28)	6.0	(0.38)
Italy	22.4	(1.00)	32.0	#	(1.65)	21.3	(1.45)	22.9	(1.24)
Lithuania	11.2	(0.34)	11.3		(0.25)	10.7	(0.34)	12.0	(0.61)
Malta	7.5	(0.39)	7.1		(0.31)	6.0	(0.45)	8.8	(0.58)
Poland	25.7	(1.35)	26.7		(1.51)	21.4	(1.60)	28.6	(1.95)
Portugal	17.6	(0.97)	21.8	#	(1.35)	14.2	(0.90)	20.7	(1.52)
Slovak Republic	7.4	(0.48)	7.1		(0.30)	7.0	(0.59)	7.9	(0.60)
Slovenia	8.0	(0.30)	8.5		(0.25)	7.0	(0.51)	8.4	(0.38)
Spain	25.8	(0.54)	25.3		(0.83)	26.1	(0.91)	25.7	(0.67)
EU (TALIS) average	14.0	(0.21)	15.3		(0.24)	12.4	(0.24)	15.2	(0.31)
Australia	8.1	(0.22)	9.5	#	(0.27)	6.7	(0.27)	9.1	(0.37)
Brazil	17.3	(0.65)	16.8		(1.59)	12.9	(0.96)	19.0	(0.76)
Iceland	10.8	(0.67)	10.9		(0.53)	8.8	(0.63)	12.3	(1.03)
Korea	31.6	#	27.9		(0.84)	30.2	(0.99)	32.6	(0.93)
Malaysia	11.1	(0.35)	10.5		(0.60)	10.7	(0.44)	11.4	(0.40)
Mexico	34.1	(1.76)	35.3		(5.35)	29.6	(3.74)	35.1	(1.93)
Norway	7.1	(0.29)	14.0	#	(0.75)	6.0	(0.48)	7.6	(0.38)
Turkey	12.3	#	10.0		(0.71)	10.7	(0.72)	14.0	(1.33)
TALIS average	14.9	(0.17)	15.9		(0.30)	13.1	(0.24)	16.1	(0.24)

Note: # denotes significant difference between Yes and No. The value in the flagged column is significantly higher ($p=0.05$)

Source: OECD, TALIS Database

Table 4.7. Index of professional development need of teachers related to teacher and school characteristics

Multiple regression coefficients with “Index of professional development need” as the dependent variable

Countries	Constant		Gender: male ¹		Years of experience as a teacher		Working time per week		Proportion of time spent teaching		Type of school: Private school ²		Size of Community		School enrolment	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Austria	67.73 +	(2.54)	-3.32 #	(0.68)	-0.47 #	(0.19)	-0.17	(0.57)	-8.39 #	(2.47)	-3.06 #	(0.91)	-0.27	(0.28)	-0.003 #	(0.001)
Belgium (Fl.)	64.45 +	(3.52)	-3.72 #	(0.87)	-2.23 #	(0.21)	-1.61	(0.89)	-8.81 #	(2.54)	1.80 +	(0.94)	1.52 +	(0.65)	-0.003 #	(0.001)
Bulgaria	78.90 +	(7.33)	-4.47 #	(1.68)	-0.70	(0.46)	-1.67	(1.73)	-7.79	(5.76)	-7.41 #	(3.40)	-1.27	(0.83)	-0.006 #	(0.002)
Denmark	62.78 +	(5.62)	-1.56	(1.25)	-0.77 #	(0.35)	-0.54	(1.61)	-3.34	(6.46)	-6.60 #	(1.99)	0.06	(0.57)	-0.004	(0.005)
Estonia	82.35 +	(4.54)	-4.06 #	(0.96)	-1.48 #	(0.22)	-0.97	(0.68)	-8.18 #	(2.69)	-4.04	(3.65)	-1.63 #	(0.51)	0.000	(0.002)
Hungary	60.76 +	(5.17)	-3.03 #	(1.29)	-0.13	(0.43)	-2.93 #	(1.38)	-9.46 #	(3.90)	-2.02	(1.50)	-0.49	(0.47)	0.001	(0.002)
Ireland	58.88 +	(3.87)	-1.38	(1.16)	-0.04	(0.26)	-0.07	(1.34)	-9.03 #	(4.19)	0.14	(1.03)	-0.84	(0.47)	-0.001	(0.002)
Italy	79.20 +	(4.10)	-1.86	(0.95)	-1.06 #	(0.20)	-4.04 #	(1.19)	-7.23 #	(2.57)	-0.26	(2.87)	0.30	(0.36)	0.000	(0.001)
Lithuania	79.82 +	(3.59)	-5.55 #	(1.02)	-0.90 #	(0.29)	-1.71 #	(0.73)	-5.30 #	(2.53)	-1.77	(1.62)	-0.33	(0.47)	0.003 +	(0.001)
Malta	59.43 +	(5.36)	-0.52	(1.21)	-0.52	(0.40)	0.21	(1.99)	-7.47	(4.28)	-3.19 #	(1.42)	0.13	(1.16)	-0.002	(0.002)
Poland	68.40 +	(3.90)	-2.24 #	(0.91)	-1.73 #	(0.23)	-1.30	(1.00)	-5.25 #	(2.19)	-4.31	(2.53)	0.44	(0.43)	0.000	(0.003)
Portugal	74.67 +	(3.08)	-5.99 #	(0.65)	-0.06	(0.26)	-1.52	(1.13)	-4.87 #	(2.45)	-4.38 #	(1.10)	-0.28	(0.40)	-0.001	(0.001)
Slovak Republic	75.41 +	(3.87)	-4.36 #	(1.04)	-1.12 #	(0.22)	-2.39 #	(0.85)	-15.99 #	(2.80)	-0.18	(2.18)	-1.38 #	(0.61)	-0.002	(0.003)
Slovenia	65.78 +	(2.71)	-3.85 #	(0.84)	0.08	(0.22)	-1.49	(1.04)	-8.71 #	(2.58)	a	a	0.58	(0.37)	0.001	(0.002)
Spain	67.01 +	(3.05)	-2.33 #	(0.64)	-2.13 #	(0.26)	-0.69	(1.10)	-3.03	(3.00)	-0.71	(1.29)	-0.05	(0.35)	-0.000	(0.001)
EU (TALIS) average	69.70		-3.22		-0.88		-1.39		-7.52		-2.57		-0.24		-0.001	
Australia	59.00 +	(2.85)	-0.64	(0.76)	-2.06 #	(0.18)	-0.06	(0.80)	-6.10 #	(2.05)	-0.85	(0.67)	0.08	(0.42)	0.000	(0.001)
Brazil	65.90 +	(4.44)	-0.62	(0.98)	0.02	(0.27)	-0.22	(0.70)	1.99	(3.10)	-8.40 #	(1.87)	0.66	(0.50)	-0.000	(0.001)
Iceland	66.42 +	(6.89)	-4.68 #	(1.24)	-1.06 #	(0.33)	-0.63	(1.45)	-6.26	(3.24)	1.50	(4.55)	-1.16	(0.69)	0.001	(0.004)
Korea	85.41 +	(4.30)	-2.17 #	(0.66)	-1.45 #	(0.17)	-0.68	(3.23)	-6.50 #	(2.37)	0.19	(0.79)	-0.65	(0.42)	0.002	(0.001)
Malaysia	97.75 +	(5.13)	0.69	(0.74)	-2.11 #	(0.28)	-1.03	(2.14)	-3.29	(2.60)	-6.63	(3.75)	-1.74 #	(0.68)	-0.002 #	(0.001)
Mexico	51.26 +	(4.86)	-1.35	(1.03)	0.11	(0.44)	-0.38	(0.98)	1.16	(3.73)	2.15	(2.10)	-0.37	(0.49)	-0.000	(0.002)
Norway	61.03 +	(4.72)	-4.56 #	(0.87)	-0.29	(0.20)	-0.61	(1.03)	-0.87	(2.94)	3.90	(2.94)	-0.23	(0.66)	-0.001	(0.004)
Turkey	62.09 +	(7.57)	-4.64 #	(1.96)	-2.63 #	(0.39)	2.74 +	(1.21)	-4.53	(4.83)	-2.81	(1.59)	-0.20	(0.73)	0.001	(0.001)
TALIS average	69.32		-2.88		-0.99		-0.95		-5.97		-2.13		-0.31		-0.001	

Note: # denotes a significant negative relation; + denotes a significant positive relation

¹ For gender, a positive coefficient indicates higher values for male teachers

² For type of school, a positive coefficient indicates higher values for private schools

Source: OECD, TALIS Database

Table 4.8. Impact of different types of professional development undertaken by teachers upon their development as a teacher (2007-08)

Percentage of teachers of lower secondary education reporting that the professional development undertaken in the previous 18 months had a moderate or high impact upon their development as a teacher

Countries	Courses and workshops		Education conferences and seminars		Qualification programmes		Observation visits to other schools		Professional development network		Individual and collaborative research		Mentoring and peer observation		Reading professional literature		Informal dialogue to improve teaching	
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
Austria	75.7	(0.89)	55.5	(1.24)	89.0	(1.21)	61.0	(2.99)	68.6	(1.33)	88.4	(0.96)	72.7	(1.63)	82.4	(0.69)	84.9	(0.71)
Belgium (Fl.)	52.9	(1.26)	42.6	(1.82)	67.0	(2.01)	47.0	(2.84)	53.9	(1.92)	67.6	(1.52)	48.1	(2.64)	57.8	(1.20)	71.7	(1.05)
Bulgaria	84.2	(1.58)	80.6	(1.67)	88.0	(2.06)	79.3	(3.00)	86.2	(1.83)	87.1	(1.70)	86.0	(1.68)	92.3	(1.21)	86.3	(1.20)
Denmark	86.0	(0.96)	82.9	(1.70)	96.8	(1.18)	83.6	(3.34)	88.1	(1.32)	94.6	(0.86)	78.7	(3.45)	84.9	(1.14)	92.8	(0.89)
Estonia	86.4	(0.74)	70.4	(1.52)	90.4	(0.99)	69.9	(1.27)	84.3	(1.06)	90.5	(1.04)	76.8	(1.58)	87.3	(0.70)	81.8	(0.94)
Hungary	86.1	(1.04)	78.2	(1.46)	93.1	(0.93)	81.4	(1.74)	84.8	(1.11)	93.8	(1.30)	91.1	(1.00)	92.6	(0.78)	92.9	(0.89)
Ireland	81.9	(0.96)	74.5	(1.55)	92.5	(1.53)	81.0	(4.35)	78.7	(1.36)	86.8	(1.41)	71.3	(2.81)	71.0	(1.55)	83.0	(1.00)
Italy	81.9	(1.17)	78.5	(1.16)	86.8	(1.58)	82.6	(2.06)	86.6	(1.06)	95.1	(0.45)	89.6	(1.03)	90.9	(0.60)	90.6	(0.47)
Lithuania	91.4	(0.62)	83.2	(1.03)	88.2	(1.26)	90.7	(0.81)	90.0	(0.94)	91.4	(0.78)	85.2	(1.24)	96.2	(0.41)	92.0	(0.64)
Malta	73.9	(1.65)	70.0	(2.47)	94.4	(1.56)	69.8	(3.87)	75.2	(2.45)	89.8	(1.57)	67.8	(3.78)	78.1	(1.83)	84.3	(1.29)
Poland	86.3	(0.73)	75.8	(1.31)	92.1	(0.97)	78.2	(2.29)	88.3	(0.91)	92.8	(0.90)	77.9	(1.11)	93.4	(0.49)	90.0	(0.70)
Portugal	82.8	(0.88)	73.0	(1.38)	87.0	(1.12)	67.4	(1.82)	80.7	(2.04)	94.0	(0.76)	87.6	(1.84)	78.9	(1.04)	88.1	(0.68)
Slovak Republic	75.5	(1.57)	75.9	(1.44)	83.0	(1.43)	66.0	(2.02)	78.0	(1.93)	83.8	(3.72)	78.6	(1.10)	88.8	(1.03)	85.9	(0.85)
Slovenia	83.3	(0.73)	78.6	(0.91)	80.2	(2.43)	77.3	(2.74)	64.1	(1.30)	89.9	(1.44)	76.1	(1.53)	81.5	(0.85)	87.0	(0.74)
Spain	76.5	(0.94)	71.8	(1.75)	73.1	(1.97)	76.2	(2.31)	81.5	(1.49)	89.9	(0.89)	81.1	(1.49)	74.4	(1.01)	80.2	(0.74)
EU (TALIS) average	80.3	(0.28)	72.8	(0.40)	86.8	(0.40)	74.1	(0.69)	79.3	(0.40)	89.0	(0.38)	77.9	(0.53)	83.4	(0.27)	86.1	(0.23)
Australia	78.5	(1.04)	67.6	(1.32)	78.6	(2.67)	72.2	(2.26)	73.5	(1.27)	85.8	(1.53)	72.5	(1.40)	66.4	(1.28)	86.0	(0.85)
Brazil	76.1	(1.07)	72.9	(1.32)	89.9	(0.93)	67.5	(1.49)	73.4	(1.91)	80.9	(1.26)	65.8	(1.66)	82.6	(1.09)	76.5	(0.99)
Iceland	83.0	(1.13)	73.7	(1.75)	92.4	(1.76)	80.5	(1.37)	90.6	(0.85)	94.2	(1.70)	77.8	(2.09)	88.7	(0.97)	91.8	(0.85)
Korea	79.2	(0.87)	75.1	(1.36)	84.2	(1.37)	65.2	(1.15)	85.4	(1.01)	89.9	(0.82)	69.5	(1.17)	77.4	(1.22)	85.8	(0.67)
Malaysia	94.4	(0.48)	89.1	(1.05)	95.0	(0.88)	87.6	(1.30)	90.3	(0.97)	88.8	(1.17)	89.9	(0.89)	86.4	(0.78)	92.2	(0.49)
Mexico	85.4	(0.77)	82.2	(1.54)	91.3	(1.03)	77.7	(1.65)	81.3	(1.69)	91.0	(0.69)	78.3	(1.59)	84.0	(0.98)	81.6	(0.92)
Norway	79.3	(0.96)	73.7	(1.46)	93.7	(1.24)	71.9	(2.39)	81.1	(1.83)	95.3	(1.39)	77.9	(2.62)	78.1	(0.93)	95.7	(0.44)
Turkey	72.9	(1.78)	74.1	(1.65)	79.3	(3.77)	87.8	(1.99)	80.5	(1.43)	92.3	(2.11)	84.8	(1.77)	91.3	(1.17)	92.8	(1.01)
TALIS average	80.6	(0.23)	73.9	(0.31)	87.2	(0.35)	74.9	(0.50)	80.2	(0.31)	89.3	(0.30)	77.6	(0.41)	82.8	(0.22)	86.7	(0.18)

Note: Scores from a 4-point scale: 1= No impact; 2= A small impact; 3= A moderate impact; 4= A large impact

Source: OECD, 2009, Table 3.8

Table 4.9. Support for the professional development undertaken by teachers (2007-08)

Percentage of teachers who undertook professional development who received the following types of support taken in the previous 18 months had a moderate or high impact upon their development as a teacher

Countries	Teacher contribution to the cost of professional development undertaken						Teacher received scheduled time		Teacher received salary supplement	
	Teacher had to pay none of the costs of the professional development			Teacher had to pay some of the costs of the professional development			Teacher had to pay all of the costs of the professional development			
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)
Austria	43.7	(1.00)	49.7	(1.01)	6.6	(0.45)	89.0	(0.72)	11.7	(0.68)
Belgium (Fl.)	81.4	(1.32)	15.3	(1.10)	3.2	(0.46)	78.1	(1.63)	2.2	(0.49)
Bulgaria	73.4	(2.06)	20.5	(2.16)	6.1	(0.68)	40.4	(1.88)	8.1	(0.91)
Denmark	77.3	(1.45)	16.3	(1.13)	6.4	(0.93)	71.8	(2.34)	9.2	(1.64)
Estonia	72.5	(0.98)	25.6	(0.93)	2.0	(0.28)	64.2	(1.37)	12.0	(0.88)
Hungary	71.5	(1.99)	20.5	(1.76)	8.0	(0.76)	44.4	(2.95)	5.9	(0.85)
Ireland	79.3	(1.03)	17.5	(0.99)	3.2	(0.46)	94.7	(0.53)	5.8	(0.67)
Italy	68.7	(1.04)	13.7	(0.65)	17.6	(0.78)	30.9	(1.38)	9.6	(0.74)
Lithuania	65.2	(1.75)	30.0	(1.48)	4.8	(0.57)	69.1	(1.26)	6.5	(0.58)
Malta	87.1	(1.29)	10.6	(1.18)	2.2	(0.51)	78.2	(1.62)	48.7	(1.94)
Poland	44.2	(1.30)	45.1	(1.12)	10.7	(0.85)	57.0	(1.68)	5.4	(0.61)
Portugal	50.3	(1.43)	25.2	(1.14)	24.5	(1.24)	25.1	(1.68)	2.0	(0.33)
Slovak Republic	70.4	(1.37)	24.1	(1.21)	5.5	(0.57)	69.2	(1.47)	28.3	(1.72)
Slovenia	85.3	(0.91)	13.7	(0.87)	1.0	(0.22)	79.3	(1.28)	29.7	(1.18)
Spain	54.8	(1.33)	29.6	(1.00)	15.6	(0.87)	29.5	(1.48)	3.3	(0.41)
EU (TALIS) average	68.3	(0.36)	23.8	(0.32)	7.8	(0.18)	61.4	(0.43)	12.6	(0.27)
Australia	74.5	(1.24)	24.3	(1.24)	1.2	(0.26)	85.5	(0.86)	5.5	(0.57)
Brazil	54.8	(1.59)	26.9	(1.36)	18.3	(1.22)	56.2	(1.67)	10.9	(0.88)
Iceland	67.8	(1.34)	27.8	(1.42)	4.5	(0.61)	70.3	(1.39)	17.9	(1.24)
Korea	27.1	(1.07)	58.5	(1.06)	14.4	(0.79)	24.3	(0.94)	19.8	(1.02)
Malaysia	43.5	(1.52)	52.7	(1.54)	3.9	(0.38)	88.6	(0.80)	2.5	(0.31)
Mexico	43.2	(1.31)	38.0	(1.12)	18.8	(1.14)	71.1	(1.52)	2.9	(0.45)
Norway	79.8	(1.14)	17.0	(1.05)	3.3	(0.44)	66.3	(1.56)	7.2	(0.74)
Turkey	82.9	(1.87)	12.1	(1.90)	5.0	(0.95)	61.2	(2.96)	6.9	(1.19)
TALIS average	65.2	(0.29)	26.7	(0.27)	8.1	(0.15)	62.8	(0.34)	11.4	(0.20)

Source: OECD, 2009, Table 3.5

Table 4.10. Frequency of mentoring and induction programmes (2007-08)

Percentage of teachers of lower secondary education whose school principal reported the existence of induction processes and mentoring programmes for teachers new to the school

Countries	Existence of formal induction process in school						Existence of a mentoring programme or policy in school								
	Yes, for all teachers new to the school			No formal induction process			Yes, for all teachers new to the school			Yes but only for those in their first teaching job			No formal mentoring process		
	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%	(SE)	%
Austria	32.1	(3.15)	23.6	(2.61)	44.3	(2.99)	23.0	(2.73)	23.0	(2.64)	54.1	(3.24)			
Belgium (Fl.)	94.4	(1.69)	3.9	(1.21)	1.7	(1.08)	90.5	(2.08)	8.8	(2.02)	0.7	(0.49)			
Bulgaria	53.2	(4.94)	30.7	(6.13)	16.2	(3.85)	29.6	(3.95)	53.5	(4.87)	16.9	(3.51)			
Denmark	47.7	(5.22)	23.5	(4.51)	28.8	(3.81)	62.6	(4.52)	27.0	(3.77)	10.4	(2.65)			
Estonia	23.1	(3.68)	59.1	(4.19)	17.8	(3.14)	25.8	(3.49)	64.9	(3.81)	9.2	(1.98)			
Hungary	34.8	(5.06)	46.4	(5.26)	18.8	(3.46)	44.8	(4.50)	44.2	(4.68)	11.0	(2.40)			
Ireland	83.7	(3.67)	7.2	(2.68)	9.0	(2.64)	63.8	(4.21)	10.7	(2.44)	25.5	(4.10)			
Italy	36.6	(2.87)	34.4	(2.91)	29.0	(2.81)	26.3	(2.70)	61.3	(2.99)	12.4	(2.16)			
Lithuania	17.1	(2.61)	14.0	(2.49)	68.9	(3.26)	29.0	(3.59)	50.6	(4.08)	20.4	(3.13)			
Malta	25.3	(0.17)	11.8	(0.11)	62.9	(0.18)	22.4	(0.18)	12.3	(0.12)	65.3	(0.20)			
Poland	14.3	(3.13)	79.4	(3.63)	6.3	(2.15)	23.5	(3.97)	71.9	(4.32)	4.6	(1.87)			
Portugal	73.1	(3.52)	4.2	(1.69)	22.7	(3.20)	41.3	(4.48)	20.4	(3.53)	38.3	(4.32)			
Slovak Republic	62.1	(3.85)	35.5	(3.67)	2.4	(1.53)	26.4	(4.06)	71.3	(4.22)	2.4	(1.32)			
Slovenia	41.1	(3.83)	51.5	(4.06)	7.4	(2.01)	23.5	(3.55)	64.6	(4.02)	11.9	(2.65)			
Spain	20.9	(3.22)	15.7	(2.71)	63.4	(3.70)	17.6	(2.77)	18.1	(2.74)	64.3	(3.60)			
EU (TALIS) average	44.0	(0.93)	29.4	(0.91)	26.7	(0.74)	36.7	(0.92)	40.2	(0.92)	23.2	(0.71)			
Australia	93.1	(2.41)	5.6	(2.21)	1.3	(0.96)	70.4	(4.59)	23.8	(4.27)	5.8	(1.84)			
Brazil	19.8	(2.38)	6.5	(1.42)	73.7	(2.46)	17.7	(2.11)	11.7	(2.03)	70.7	(2.91)			
Iceland	72.8	(0.17)	15.7	(0.13)	11.5	(0.12)	44.7	(0.17)	48.4	(0.16)	6.9	(0.04)			
Korea	33.6	(3.33)	49.8	(3.75)	16.6	(3.03)	26.8	(3.76)	44.3	(4.37)	29.0	(4.18)			
Malaysia	43.0	(3.62)	40.9	(4.00)	16.2	(2.87)	45.0	(3.71)	38.1	(3.82)	16.9	(2.61)			
Mexico	22.7	(3.35)	14.7	(2.91)	62.6	(3.94)	19.2	(3.47)	20.4	(3.52)	60.5	(4.14)			
Norway	29.9	(3.83)	18.3	(3.25)	51.8	(4.27)	43.3	(3.85)	25.4	(3.67)	31.3	(3.67)			
Turkey	50.2	(5.27)	16.2	(4.04)	33.6	(5.10)	22.3	(4.85)	69.6	(5.51)	8.1	(3.22)			
TALIS average	44.5	(0.73)	26.5	(0.70)	29.0	(0.62)	36.5	(0.75)	38.4	(0.76)	25.1	(0.60)			

Source: OECD, 2009, Table 3.6

Table 4.11. Percentages of all teachers who wanted to participate in more professional development and reasons for not participating in more professional development (2007-08)

Percentages based on all teachers

Countries	Percentage of all teachers who wanted to participate in more professional development		Reasons of non-participating teachers for not undertaking more professional development						Family responsibilities		No suitable professional development			
	%	(SE)	Did not have the prerequisites	Too expensive	Lack of employer support	Conflict with work schedule	Family responsibilities	No suitable professional development	%	(SE)	%	(SE)		
Austria	44,7	(0,93)	2,6	(0,46)	18,0	(0,93)	9,2	(0,79)	41,5	(1,34)	29,0	(1,21)	64,1	(1,16)
Belgium (Fl.)	30,5	(0,98)	3,6	(0,86)	11,8	(1,33)	10,8	(1,40)	43,2	(1,68)	40,6	(1,70)	38,8	(1,73)
Bulgaria	68,9	(1,77)	7,0	(1,61)	34,5	(2,41)	2,9	(0,47)	24,4	(1,46)	16,6	(1,22)	48,2	(2,35)
Denmark	47,6	(1,39)	1,8	(0,44)	29,6	(1,94)	38,3	(1,76)	23,7	(1,90)	15,4	(1,21)	42,1	(1,98)
Estonia	48,7	(1,07)	4,2	(0,62)	35,1	(1,59)	15,3	(1,30)	60,5	(1,65)	25,2	(1,35)	52,3	(1,61)
Hungary	40,2	(2,00)	5,6	(0,85)	46,8	(2,40)	22,9	(1,89)	40,2	(1,87)	24,4	(1,76)	25,8	(1,88)
Ireland	54,1	(1,37)	5,5	(0,75)	12,2	(0,96)	13,9	(1,47)	42,6	(1,53)	29,4	(1,57)	45,2	(1,83)
Italy	56,4	(0,98)	5,1	(0,44)	23,5	(1,23)	5,8	(0,50)	43,0	(1,47)	40,8	(1,38)	47,1	(1,37)
Lithuania	44,7	(1,10)	7,7	(0,90)	25,7	(1,44)	15,9	(1,19)	46,6	(1,63)	26,3	(1,20)	53,1	(1,60)
Malta	43,3	(1,79)	4,7	(1,06)	18,4	(2,06)	10,2	(1,73)	38,8	(2,37)	45,4	(2,85)	40,5	(2,84)
Poland	43,6	(1,04)	3,4	(0,51)	51,2	(1,72)	12,3	(1,20)	40,7	(1,90)	32,6	(1,63)	38,7	(1,84)
Portugal	76,2	(0,91)	6,5	(0,63)	36,3	(1,14)	10,4	(0,66)	65,4	(1,26)	35,6	(1,28)	48,2	(1,23)
Slovak Republic	43,2	(1,34)	9,5	(0,95)	18,8	(1,48)	12,7	(1,31)	38,1	(1,94)	20,5	(1,34)	57,8	(1,82)
Slovenia	35,1	(1,18)	3,7	(0,73)	35,7	(1,56)	18,1	(1,47)	47,5	(1,77)	22,2	(1,26)	32,4	(1,52)
Spain	60,6	(1,02)	6,7	(0,67)	19,2	(0,99)	6,3	(0,66)	50,3	(1,23)	48,4	(1,43)	38,4	(1,25)
EU (TALIS) average	49,2	(0,34)	5,2	(0,21)	27,8	(0,42)	13,7	(0,33)	43,1	(0,44)	30,2	(0,40)	44,9	(0,46)
Australia	55,2	(1,37)	3,2	(0,59)	32,6	(1,61)	26,5	(1,52)	61,7	(1,93)	27,6	(1,73)	40,5	(1,80)
Brazil	84,4	(0,77)	5,1	(0,46)	51,0	(1,46)	24,6	(1,35)	57,8	(1,46)	18,4	(0,92)	27,0	(1,22)
Iceland	37,9	(1,47)	1,8	(0,70)	18,6	(1,61)	6,7	(1,18)	43,0	(2,41)	35,4	(1,99)	47,0	(2,36)
Korea	58,2	(1,16)	11,9	(0,95)	19,9	(0,98)	8,7	(0,93)	73,3	(1,26)	32,7	(1,30)	42,2	(1,28)
Malaysia	82,9	(0,95)	28,4	(1,38)	22,2	(1,40)	13,6	(1,14)	58,8	(1,30)	31,2	(1,32)	45,8	(1,25)
Mexico	85,3	(0,85)	17,2	(1,07)	49,0	(1,44)	21,1	(1,01)	48,7	(1,31)	37,4	(1,29)	20,3	(0,97)
Norway	70,3	(1,13)	2,5	(0,38)	31,6	(1,36)	26,4	(1,79)	50,4	(1,44)	26,5	(1,37)	30,0	(1,36)
Turkey	48,2	(2,21)	16,9	(2,02)	12,4	(1,48)	11,9	(1,50)	34,6	(3,46)	31,1	(2,68)	46,5	(2,24)
TALIS average	54,8	(0,27)	7,1	(0,19)	28,4	(0,32)	15,0	(0,27)	46,7	(0,37)	30,1	(0,33)	42,3	(0,36)

Source: OECD, 2009, Table 3.7

Table 4.11 a. Percentages of non-participating teachers who wanted to participate in more professional development and reasons for not participating in more professional development (2007-08)

Percentages based on teachers who did not participate in professional development in the previous 18 months

Countries	Percentage of non-participating teachers who wanted to participate in more professional development		Reasons for non-participating teachers for not undertaking more professional development							No suitable professional development				
	%	(SE)	Did not have the prerequisites	Too expensive	Lack of employer support	Conflict with work schedule	Family responsibilities	%	(SE)	%	(SE)			
Austria	46.5	(4.20)	7.5	(3.69)	16.5	(4.16)	7.0	(2.39)	30.2	(6.40)	51.7	(6.96)	49.3	(7.34)
Belgium (Fl.)	30.7	(2.96)	1.5	(1.14)	6.5	(3.44)	9.7	(3.15)	39.7	(5.09)	40.4	(5.45)	36.5	(6.00)
Bulgaria	61.7	(4.33)	8.2	(4.99)	25.4	(4.16)	2.8	(1.10)	21.2	(5.92)	33.3	(8.38)	54.1	(6.00)
Denmark	44.7	(2.87)	2.9	(1.47)	21.1	(3.38)	30.3	(4.84)	16.3	(3.51)	18.5	(3.41)	52.2	(4.40)
Estonia	50.1	(3.65)	14.2	(3.27)	28.5	(4.86)	12.2	(3.34)	51.5	(5.14)	17.5	(4.03)	49.1	(5.19)
Hungary	42.5	(3.11)	7.1	(2.08)	37.8	(5.55)	25.3	(5.74)	31.3	(5.53)	19.8	(3.25)	29.7	(4.94)
Ireland	54.1	(4.85)	10.6	(3.34)	4.5	(2.13)	21.7	(3.94)	24.6	(3.91)	21.5	(3.93)	57.9	(5.37)
Italy	62.4	(2.19)	9.5	(1.44)	19.6	(2.38)	3.4	(0.82)	33.4	(2.80)	45.6	(2.89)	43.8	(2.88)
Lithuania	34.0	(4.16)	13.1	(5.85)	15.8	(8.46)	23.4	(9.46)	35.9	(9.40)	35.6	(8.90)	49.2	(8.60)
Malta	53.2	(6.12)	2.0	(2.01)	12.7	(7.76)	10.5	(7.01)	41.3	(8.73)	41.4	(8.45)	49.7	(9.23)
Poland	28.0	(2.64)	6.2	(3.06)	29.4	(7.09)	15.5	(6.96)	33.4	(5.95)	23.7	(5.59)	46.7	(6.27)
Portugal	76.3	(1.95)	9.0	(1.79)	26.3	(2.63)	11.8	(2.05)	53.4	(3.17)	34.1	(3.03)	54.0	(3.12)
Slovak Republic	37.6	(2.49)	13.7	(2.63)	13.8	(2.74)	10.9	(2.16)	28.7	(3.11)	24.6	(3.58)	62.7	(4.71)
Slovenia	41.6	(6.35)	11.2	(6.25)	16.0	(7.12)	11.3	(5.44)	30.4	(8.80)	15.3	(7.49)	50.2	(9.88)
Spain	a	a	a	a	a	a	a	a	a	a	a	a	a	a
EU (TALIS) average	47.4	(1.05)	8.3	(0.92)	19.6	(1.37)	14.0	(1.29)	33.7	(1.58)	30.2	(1.55)	48.9	(1.69)
Australia	69.6	(6.39)	7.1	(4.37)	25.8	(4.78)	34.6	(8.16)	28.9	(6.85)	16.7	(6.12)	61.8	(9.35)
Brazil	78.0	(2.16)	6.9	(1.48)	45.3	(3.34)	32.3	(4.00)	48.4	(3.48)	20.2	(2.64)	44.3	(3.43)
Iceland	33.1	(2.95)	3.7	(2.36)	12.5	(3.47)	7.0	(2.82)	28.1	(4.86)	28.0	(4.83)	50.6	(5.30)
Korea	41.8	(3.33)	5.3	(2.87)	15.8	(3.88)	10.2	(3.94)	57.8	(4.94)	45.6	(6.05)	50.3	(5.22)
Malaysia	70.4	(2.69)	29.7	(3.37)	20.9	(3.13)	22.1	(3.29)	52.3	(3.72)	31.8	(3.53)	50.7	(3.97)
Mexico	75.7	(2.70)	23.1	(4.24)	37.6	(5.57)	22.7	(2.85)	51.5	(4.72)	42.6	(4.68)	16.0	(3.87)
Norway	77.6	(2.33)	3.5	(1.24)	31.9	(3.30)	35.9	(4.27)	38.7	(3.13)	29.4	(3.19)	32.1	(3.39)
Turkey	41.0	(5.48)	19.4	(4.99)	9.0	(2.52)	10.1	(3.21)	36.5	(5.36)	33.7	(6.76)	53.0	(5.12)
TALIS average	52.3	(0.83)	9.8	(0.73)	21.5	(1.01)	16.8	(1.00)	37.0	(1.18)	30.5	(1.17)	47.5	(1.27)

Source: OECD, TALIS Database

Explaining the perceived impact of teachers' professional development

5.1 Introduction

The preceding chapters reported results relating to teachers' in-service professional development. They examined the extent to which teachers' development needs are provided for, their patterns of participation in professional development and the perceived impact of that professional development.

The TALIS cross-sectional survey also measured variables that are thought to have an impact on teachers' professional development and may explain variations in teachers' participation in professional development activities and their perceived impact. These variables are teacher and school characteristics and include both conditional and malleable factors. Conditional factors are teacher characteristics (e.g. initial schooling, teacher training, level of education, age, sex, etc.) and school context characteristics (e.g. private/public schools, school location, school composition, school resources etc.) which cannot be influenced by teachers and principals. Malleable factors are those that can be actively controlled by principals and teachers, including variables such as teacher beliefs and attitudes, co-operation, teacher appraisal and feedback, school climate, school management styles, etc. In effectiveness research these factors are seen as process or throughput indicators.

This chapter explores the impact of both conditional and malleable teacher- and school-related variables on teachers' participation in professional development and the experienced impact. The

practical purpose of such an exploration is to get ideas about influences on the experienced impact of professional development and eventually to increase knowledge of how teachers' professional development might be further improved.

To this end, a structural model was developed and tested. It describes the relations between school- and teacher-related variables, teachers' participation in professional development and its perceived impact, using the TALIS dataset.

The chapter starts out with a description of the conceptual model used, followed by a description of the measurements used and the analyses conducted. Next, the most important results are reported and discussed.

5.2 Conceptual framework

In Chapter 2, findings of research into the impact of different teacher- and school-related variables on teachers' professional development and teaching were reviewed. Based on that review, four sets of variables can be distinguished to explain variations in teachers' participation in professional development activities and their impact as perceived by teachers.

The first set of variables concerns teachers' background. These variables include teacher characteristics such as sex and level of education. As the review showed, consistent and strong effects of these variables on the quality of teaching were not found,

except for level of education. Furthermore, research on continuous professional learning did not show the importance of any teacher background variables for their need for and participation in professional development activities. Based on these results, these variables are not expected to have a strong effect on teachers' participation in professional development and its impact. Still, teacher's background variables are included in the model, as antecedent variables, in order to control for possible effects.

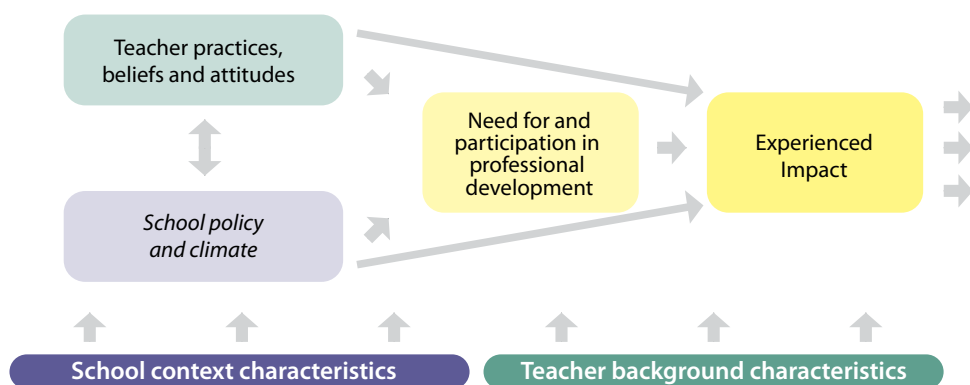
The second set of variables concerns the school context. School effectiveness research has shown that school composition, school characteristics (rural, private, etc.) and contextual factors at district and/or national level (e.g. decentralisation, accountability, etc.) do affect school policies, the quality of the teaching staff and teachers' instruction. However, no consistent and strong effects of these variables on the professional development of teachers have been found. There are some indications, especially in studies conducted in the United States, that professional learning is promoted more in small schools than in larger ones. This suggests that school autonomy and school composition will affect teachers' participation in professional development activities and the perceived impact of their professional development. Therefore school context characteristics are included as antecedent variables in the model.

The third set of variables refers to teachers' beliefs, attitudes and teaching practices. One of the most consistent findings in research on school improvement is that teachers' knowledge, beliefs, attitudes and existing practices affect the impact of profes-

sional development on changes in instruction and improved student learning. As the review showed, teachers' subject knowledge and their sense of self-efficacy appeared to be key variables in explaining professional learning and its impact on teachers' practice and improved student learning. Teachers' self-efficacy especially appears as a source of motivation which influences teachers' desire to learn. Furthermore, research has shown that another source of teachers' participation in professional development activities is the extent to which teacher learning is consistent with teachers' own beliefs and practices, on the one hand, and school and state reforms and policies, on the other (coherence). It can therefore be assumed that, depending on the dominant reforms and policy in the European countries studied, teachers' instructional strategies, including constructivist and structured teaching, play a role in explaining teachers' participation in professional development.

The fourth and last set of variables included in the model relates to school organisation. As the review clearly showed, support and feedback from colleagues and principals are important for promoting teacher learning and changes in teachers' practices. Furthermore, in schools with a positive school climate and trust, teachers believe that improving the quality of education and student learning is both an individual and a collective enterprise. In such a school climate, teachers are more willing and able to invest their energies in contributing to organisational goals and performance. This will positively affect their engagement in professional learning activities. Therefore, it can be expected that school policy and climate positively affect teachers' professionalism.

Figure 5.1. Basic conceptual framework



Based on these assumptions, a conceptual framework was developed to test the relationships between teacher- and school-related variables, on the one hand, and teachers' participation in professional development and its experienced impact on the other (Figure 5.1).

As Figure 5.1 shows, six sets of variables are included in the model. The dependent variable is experienced impact. Experienced impact is expected to be directly affected by teachers' need for and participation in professional development. Furthermore, two sets of malleable factors are also distinguished as explanatory variables: teacher practices, beliefs and attitudes and school policy and climate. It is believed that these malleable variables have both a direct and indirect effect (via the need for and participation in professional development) on experienced impact. Moreover, these variables are expected to have a direct effect on participation in professional development. As a consequence, participation in professional development is assumed to mediate the effects of teacher practices, beliefs and attitudes and school policy and climate. It is also assumed that the malleable school and teacher variables are interrelated. Some aspects of school policy and climate may have an impact on teachers' practices and *vice versa*. Two sets of conditional, *i.e.* antecedent, variables are distinguished: teacher background characteristics and school context characteristics. These variables are assumed to affect the other variables included in the model. Experienced impact is considered to be a latent variable. It will be measured indirectly through teachers' responses that indicate the perceived impact of seven specific professional development activities (such as workshops, conferences and mentoring).¹

5.3 Measurements

The TALIS dataset comprises numerous items that may serve as indicators for the variables included in the conceptual framework. Based on the

teacher and principal questionnaires, the variables listed in Table 5.1 were selected for inclusion in the model. For each indicator it is specified whether the information was obtained through the teacher or the principal questionnaire. Most categories only contain variables based on teacher responses. The category "school context characteristics" consists predominantly of information obtained from the school principal. The category "school policy and climate" relates to indicators measured from the two data sources, teachers and principals. Both principals' and teachers' perceptions provide valid information on the variables in this category. As mentioned, this chapter focuses specifically on professional development in more formal formats. Less formal activities, such as reading professional literature and engaging in informal dialogue with colleagues are not included in the analyses.

As part of the process of reducing the set of variables to be included in the model, a wide range of indicators were combined into a more limited number of indices. Tables 5.A2.1 and 5.A2.2 in the technical annex list the 11 scales that were constructed for inclusion in the analysis. Reliabilities (using Cronbach's alpha coefficient) are reported per country, across the 15 EU Member States that participated in TALIS and across all TALIS countries. Tables 5.2, 5.3 and 5.4 report descriptive statistics per country for the main variables. The variables that were included in the final model are described in some detail below.

Experienced impact

This is modelled as a latent variable, measured indirectly through the experienced impact of seven specific activities, as reported by the teachers. Teacher responses are considered to be reflections of the generally experienced impact of professional development. These seven activities (types of professional development) are:

- courses and workshops
- education conferences or seminars
- qualification programme

¹ The decision to focus on the more formal aspects of professional development is due to the fact that for informal activities, information on a crucial variable in the conceptual framework is not available. Teachers were only asked to report the number of days of attendance at more formal activities. As a result data from the key category "need and participation" are incomplete as regards the informal aspects of professional development.

- observation visits to other schools
- participation in a network of teachers formed specifically for the professional development of teachers
- individual or collaborative research on a topic of professional interest
- mentoring and/or peer observation and coaching, as part of a formal school arrangement.

Need for and participation in professional development

Perceived need is measured by using 11 items indicating the extent to which teachers felt a need for professional development in different domains such as student assessment practices, classroom management, ICT skills for teaching, and teaching in a multicultural setting.

Number of activities relates to the total number of professional development activities teachers had participated in during the previous 18 months. Teachers were asked to indicate their participation in the aforementioned list of seven professional development activities. The variable can be considered an indication of the *variation* in professional development activities.

Teacher practices, beliefs and attitudes

Constructivist teaching is measured using ten items indicating the frequency of instructional activities taking place in the classroom according to constructivist approaches to teaching. Examples of such activities include: “students work in small groups to come up with a joint solution to a problem” and “students make a product that will be used by someone else”.²

2 The items making up the “constructivist teaching” scale were used to construct two distinct but strongly correlated scales discussed in the first TALIS report (OECD, 2009), namely “student-oriented practices” and “enhanced activities”. Given the (very) strong correlation between both scales and the need to restrict the number of variables to be included in the structural model it was decided to construct a single “constructivist teaching” scale for the present study.

Professional collaboration is measured using five items indicating the frequency with which teachers work together on different activities. This five-item scale consists of items such as: “engage in joint activities across different classes and age groups” (see also OECD, 2009).

School policy and climate

School climate is measured using ten items indicating teachers’ satisfaction with different aspects of their school and work. Sample items include: “in this school, teachers and students usually get on well with each other” and “all in all, I am satisfied with my job”.³

Consequences of feedback is measured using six items indicating the consequences of feedback on changes in different aspects of teachers’ work. This index is based on teacher responses to items such as: “feedback and/or appraisal led to change in your work responsibilities that make the job more attractive” and “feedback and/or appraisal... led to a change in salary”.

Teacher background characteristics

Teacher education is measured using five levels of education, ranging from below tertiary education (ISCED level 5) to postgraduate (ISCED level 6).

Working hours is measured by asking teachers the number of hours they work for their school in a typical week. The hours of work may relate to actual teaching, preparation of lessons, administrative duties or other activities.

School context characteristics

Student background characteristics relate to the percentage of students who have at least one parent who has completed upper secondary education (ISCED 3). The scores on this variable reflect the overall response given by teachers in a school when requested to estimate the percentage of students

3 The “school climate” scale is developed from the items that make up the “teacher-student relations” and “teacher self-efficacy” scales in the first TALIS report (OECD, 2009). Added to these items are the above-mentioned items on teacher job satisfaction and student-teacher relations.

in their class who have at least one parent who has completed upper secondary education or higher.

School type (public – private) is based on information provided by the school principal. Three categories are distinguished: public, private with at least 50% of the school's funding from government, and private with less than 50% of the school's funding from government.

School autonomy in selecting teachers is based on principals' responses to questions regarding responsibility for certain tasks. These tasks include selecting teachers for hire, firing teachers, establishing teachers' starting salaries and determining salary increases. High scores on this index indicate considerable responsibility at the school level. For more details on the construction of this index the reader is referred to the first TALIS report (OECD, 2009).

Table 5.1. Overview of possible variables

Variable	Source (teachers/principals)
Experienced impact	
Impact of professional development in formal formats	Teachers
Need for and participation in professional development	
Days of professional development during the last 18 months	Teachers
Number of different activities participated in during the last 18 months	Teachers
Perceived professional development needs	Teachers
Teacher practices, beliefs and attitudes	
Barriers to participation in professional development	Teachers
Teacher beliefs and attitudes; structured and constructivist teaching	Teachers
Teaching practices: structured and constructivist teaching	Teachers
Collaboration and exchange among teachers	Teachers
School policy and climate	
Support for participation in professional development	Teachers
Frequency of teacher appraisal and feedback	Teachers
Consequences of teacher appraisal and feedback	Teachers
School climate and teacher satisfaction	Teachers
School management styles and educational leadership	Teachers
Frequency of school (self-) evaluation	Principal
Consequences of school evaluation	Principal
Principal beliefs and attitudes on education	Principal
Teacher background characteristics	
Gender	Teachers
Age	Teachers
Full-time/part-time employment	Teachers
Fixed-term/permanent employment	Teachers
Level of education	Teachers
Working hours	Teachers
Teaching experience	Teachers
Subjects taught	Teachers
School context characteristics	
Student population background characteristics	Teachers
Private/public school	Principal
Urbanicity of school location	Principal
School enrolment	Principal
School admission policies	Principal
School resources	Principal
Student behaviour problems	Principal
Teacher behaviour problems	Principal

Days of professional development relates to the total number of days teachers attended professional development activities during the previous 18 months. The variable can be considered an indication of the *amount* of professional development.

5.4 Model development

Here, only a broad outline of the model development process is provided. For a more detailed account the reader is referred to Annex 5.A1. The first model development phase involved a narrower selection of variables to be included and the construction of a structural model specifying the relations between the variables. At this stage the data set was split up into two parts of equal size using a random selection procedure. The first half was used to develop a structural model that fits the data. The second half was used to test whether the model developed through exploration of the first part also fits the other half of the dataset. For the construction of the model only the data that relate to the 15 EU countries participating in TALIS were used.

5.5 Results

The model thus developed and tested is displayed in Figures 5.2a and 5.2b. Standardised effects (path coefficients) are reported as well. Figure 5.2a relates to the findings across the EU Member States that participated in TALIS and Figure 5.2b relates to all countries that participated in TALIS. The effects in Figure 5.2a are all statistically significant at the .05 level (two-tailed). Results per country are reported in Tables 5.5a and 5.5b. Non-significant effects are indicated in light grey. Two effects are no longer statistically significant when the model is fitted on data that cover all TALIS countries instead of EU Member States only. These are the effect of student backgrounds on school climate and the effect of school autonomy in selecting teachers on consequences of feedback (indicated in light grey in Figure 5.2b). For most effects the size changes only to a limited extent when the model is fitted to the data for all TALIS countries instead of EU Member States alone. The most notable exceptions relate to the effects of school autonomy on consequences of feedback (.271 for EU and .076 for all TALIS) and on professional collaboration (.184 for EU and .120 for all TALIS) and the effect of school type on consequences of feedback (-.209 for EU and -.127 for all TALIS). This implies the lesser consequences of feedback in private schools.

Table 5.A2.5 in the technical annex presents the results of a number of model fit tests with regard to the model. The overall conclusion is that model fit is fair, when considering the mostly applied fit indexes. A more detailed interpretation is provided in Annex 5.A2.

The two models shown in Figures 5.2a and 5.2b indicate that days of professional development are related to experienced impact. The more days teachers attend professional development activities, the greater the experienced impact of professional development. Perceived need is significantly correlated with greater impact. Teachers who have further development needs consider the impact of professional development as larger. The number of professional development activities is also linked to experienced impact. The more teachers participated in different professional development activities, the higher their perceived impact of professional development. In addition the number of days of teachers' professional development activities is significantly correlated with the number of activities. The more days teachers attended professional development activities, the more they tended to participate in different professional activities. This *variation* in professional development activities appeared to have an even stronger effect than the sheer *amount* of professional development.

The relation between school climate and experienced impact is significant for both EU Member States and all TALIS countries. When teachers are more satisfied with different aspects of their school and work, they find that the professional activities they participated in had a greater impact. The size of the relation is large. Feedback, another school factor, also shows a significant correlation with impact. The more teachers find that feedback has led to changes in aspects of their work, the greater the perceived impact of professional development. In addition feedback is also significantly correlated with perceived need and number of activities. The more teachers receive feedback, the greater their development needs and the more they participate in different professional development activities. This leads, in

turn, to a greater experienced impact of professional development.

These findings indicate the importance of school factors for teachers' professional development. Moreover, teachers report that feedback is very important for their sense of the impact of professional development (see also below).

In contrast to expectations (see Figure 5.1), no significant relations were found between constructivist teaching and collaboration, on the one hand, and experienced impact, on the other. Nevertheless, the correlations between constructivist teaching and collaboration and number of activities are significant. The more teachers use constructivist instructional strategies in their classroom and the more they collaborate, the more they participate in different professional development activities. In addition, constructivist teaching is significantly correlated with collaboration. When teachers use more constructivist instructional strategies they are more involved in professional collaboration.

The findings also show that school factors and teacher factors are related. Feedback is significantly correlated with collaboration. The more teachers found that feedback had consequences for their work, the more they participated in collaborative activities. In addition, the more teachers collaborate, the more they are satisfied. Given the links between feedback, school climate and collaboration, on the one hand, with teacher's professional development and its experienced impact, on the other, these findings indicate that more emphasis in schools on feedback, climate and collaboration is likely to positively stimulate professional development.

Teachers with a higher level of education tend to attend more days of professional development. This relation is statistically significant for all TALIS countries. Next, the amount of working hours is significantly correlated with the number of professional development activities teachers participate in. The more teachers work, the more they participate in professional development activities.

Figure 5.2a: Empirical model of factors affecting experienced impact of professional development (EU Member States only)

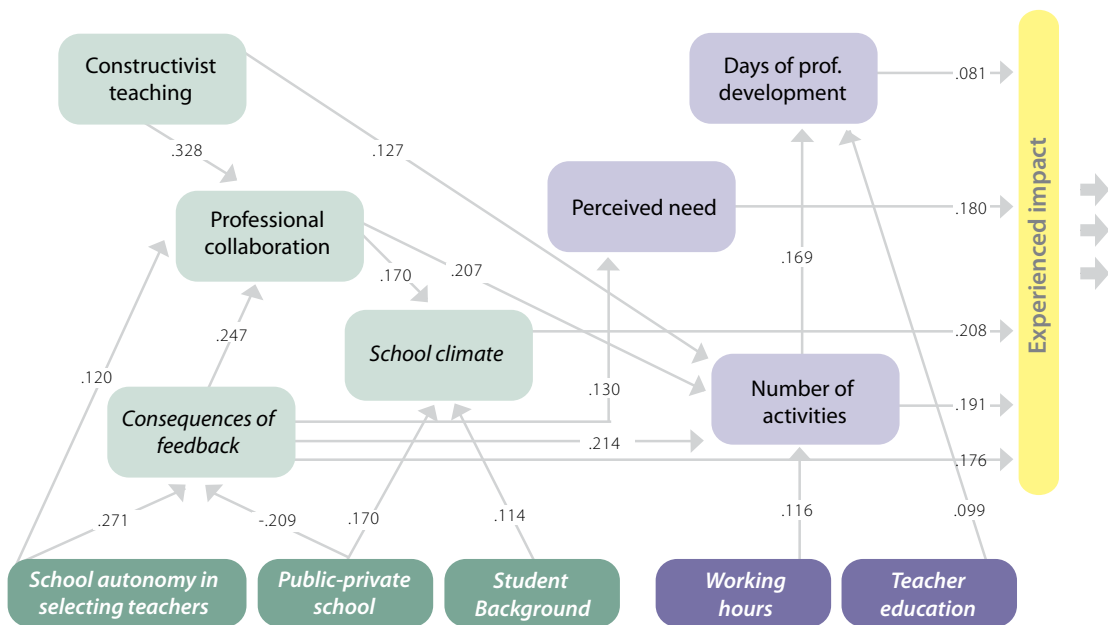
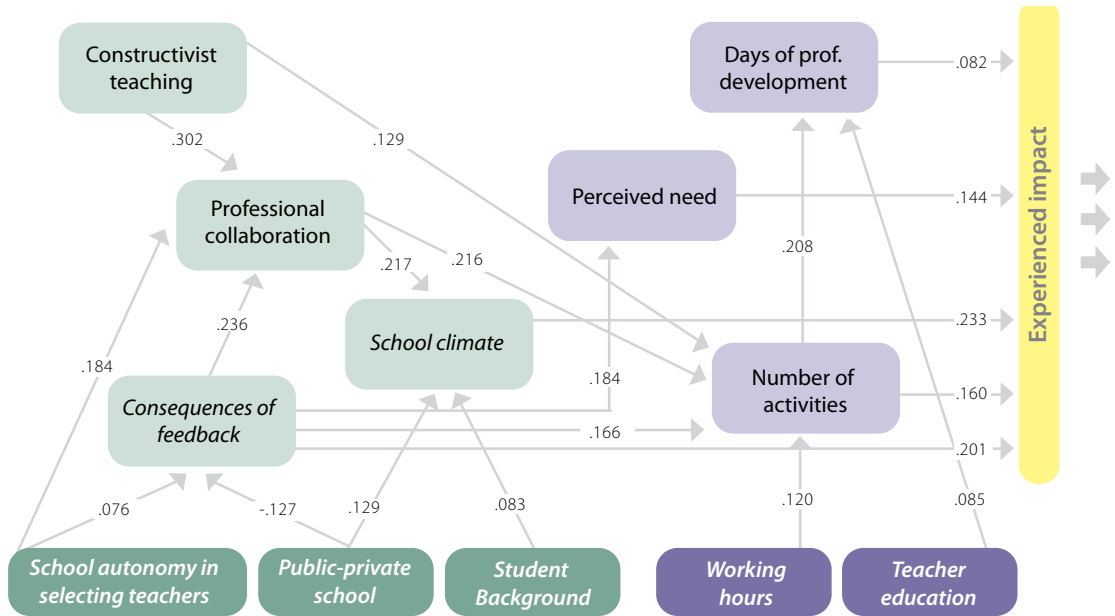


Figure 5.2b: Empirical model of factors affecting experienced impact of professional development (all TALIS countries)



With regard to school context characteristics, the findings show that these characteristics are mainly linked with school factors. In private schools and schools with advantaged student populations teachers are more satisfied with different aspects of the school and the work than teachers in public schools and schools with less advantaged students. The type of school is significantly correlated with feedback. This finding indicates that private schools make less use of feedback with consequences for teachers than public schools. As mentioned above, this correlation is smaller for all TALIS countries (Figure 5.2b) than for EU Member States only (Figure 5.2a). For EU Member States only school autonomy is significantly correlated with collaboration and feedback. In schools with more responsibility at the school level, more teachers have found that feedback has led to changes in aspects of their work and more teachers collaborate than in schools with less responsibility at the school level. The same relationships do not hold for all TALIS countries, as mentioned earlier. For all TALIS countries, school autonomy is only significantly correlated with collaboration.

Tables 5.5a and 5.5b show the results when the model is fitted on the national datasets. The findings

that are inconsistent with the model are indicated in light grey. This applies to effects that are statistically not significant at the 0.5 level (two-tailed) or effects with a sign opposite to the sign of the effect as displayed in Figures 5.2a and 5.2b. Inconsistent effects occur only in a minority of countries for most effects. However, four effects are hardly ever significant within countries, namely:

- the effect of teacher education on days of professional development
- the effect of school autonomy on professional collaboration
- the effect of school autonomy on consequences of feedback
- the effect of school type (public-private) on consequences of feedback.

This implies that these effects must relate to trends that become manifest exclusively at the across-countries level. For example, the findings per country indicate that within countries there is no relation between school autonomy and profes-

sional collaboration. The main explanation is that variation in terms of autonomy between schools is limited within countries. Between countries, however, there are substantial differences in school autonomy (see Tables 5.2, 5.3. and 5.4). Countries such as Estonia, Norway and Poland, which score high on school autonomy, tend to show high averages on professional collaboration. At the same time countries such as Malta, Spain and Turkey, with low averages on school autonomy, tend to score low on professional collaboration. Similar arguments can be made for the effect of autonomy on the consequences of feedback – Estonia, Hungary and the Slovak Republic show high averages on both variables; Spain and Austria score low; and for the effect of teacher education on days of development – Korea, Poland and Spain score high on both variables; Belgium (Fl.), Iceland and Slovenia score low. The effect of school type on consequences of feedback implies that feedback has fewer consequences in countries with high percentages of private schools and *vice versa*. Countries such as Belgium (Fl.) and Malta (high percentages of private schools and little consequences of feedback) fit well into this pattern as do Bulgaria, Lithuania, Malaysia and Poland (low percentages of private schools and strong consequences of feedback).

The total effect of a variable in the model for experienced impact is the sum of the direct effect and the indirect effect(s). Table 5.6 provides an overview of these effects. The effects are reported both for the analyses that relate exclusively to EU Member States and for those that include all participating countries. Four variables stand out as showing the strongest total effects:

- consequences of feedback (.249 in EU; .266 in all TALIS countries)
- school climate (.208 in EU; .233 in all TALIS countries)
- number of activities (.205 in EU; .177 in all TALIS countries)
- perceived need (.180 in EU; .144 in all TALIS countries).

This means that variables from the categories “school policy and climate” and “need and participation” are the most important when it comes to explaining the experienced impact of professional development. Direct effects turn out to be the most important ingredients of the total effects. Still, indirect effects account for nearly one-third of the total effect of feedback consequences.

The following variables display more moderate effects:

- professional collaboration (.075 in EU; .085 in all TALIS countries)
- days of development (.081 in EU; .082 in all TALIS countries)
- school autonomy with respect to selecting teachers (.079 in EU; .036 in all TALIS countries)
- constructivist teaching (.049 in EU; .046 in all TALIS countries).

The effects of school autonomy and collaboration are entirely indirect. School autonomy effects are mainly at work at the country level.

Rather modest effects (all indirect) were found for the following variables:

- teachers' working hours (.024 in EU; .021 in all TALIS countries)
- student background (.024 in EU; .019 in all TALIS countries)
- public-private school (-.019 in EU; -.005 in all TALIS countries; *i.e.* less impact experience at private schools)
- teacher education (.008 in EU; .007 in all TALIS countries)

School factors turn out to be quite important for experienced impact. This is definitely true for malleable factors (consequences of feedback and school climate) and to a lesser extent for antecedent variables (autonomy).

5.6 Conclusions

This chapter analyses the influence of school and teacher factors on teachers' participation in professional development activities and its perceived impact. In order to describe the relations between different variables, a model was developed and tested, using the TALIS dataset. The model comprises six categories of variables, including need for and participation in number of professional development activities, school policy and climate, teacher practices and beliefs, school context characteristics and teacher background characteristics. The influence of these different sets of variables on teachers' perception of the impact of professional development was tested. It was expected that teachers' need for and participation in professional development activities would have direct effects on perceived impact. Furthermore, it was assumed that school and teacher factors have direct and indirect effects, via needs and participation, on perceived impact.

Path analysis identifies the relation between the variation and amount of professional development activities and the impact of professional development as experienced by teachers. When teachers participate in various professional learning activities and spend more days on professional development, they find that professional development has a greater impact on their work. These findings offer support for the importance of the duration and variety of professional development activities for teacher's professional development. For professional development to become effective for teachers' practice and improved student learning, teachers should spend a good deal of time in professional development and especially on different activities. Recent researchers stress more and more the notion of duration as a key feature of professional development (Desimone, 2009). The findings of this study provide support for the argument that duration counts for teacher learning. However, variety appears to be an even more important variable in explaining perceived impact. This has important policy implications. Policy measures at different levels (government and school) to stimulate teachers' participation in professional development activities can contribute to changing teaching practices and, in turn, to improved student learning.

The findings also show that teachers who have greater professional development needs find that professional development has a stronger impact on their work. These findings indicate that teachers' motivation plays an important role in the impact of professional development on teachers' practice as perceived by teachers themselves. Research has shown that motivated teachers have a higher sense of self-efficacy, are more willing to experiment, are more open to learning and are more persistent (see Chapter 3). Although teachers' sense of self-efficacy was not included in the model, perceived need may be interpreted as an indicator of teacher motivation. As such, the findings give support to the view that teacher motivation plays an important role in fostering professional development.

A clear finding is that feedback, as part of school policy, is strongly linked to teachers' professional development and to its impact. In this study, feedback refers to the perceived consequences of feedback on changes in different aspects of teachers' work. There is ample evidence to show that supporting teachers in ways that help them to change different aspects of their work is important for their motivation to learn, collaboration and commitment to change their practice. In research on professional learning communities, discussed in Chapter 3, feedback and support are considered fundamental for fostering teacher learning at the school level. The findings of this study support this view by showing the key role of feedback as part of school policy and highlight the importance of appraisal and feedback for both teachers and schools. Greater emphasis on the system of appraisal and feedback could strengthen its benefits within schools. The results can be used to plan and structure the professional development of individual teachers. By emphasising teacher appraisal and feedback, policy makers, administrators and school leaders can contribute to the development of schools as organisations that foster continuous professional learning and sustained improvement.

The findings also show the important role of climate. Teachers who feel good about their job and in their school view the effects of their professional development more positively. By promoting a positive school climate and high levels of trust in schools, principals can create a supportive environment for

teacher learning. The important role of school climate for teacher learning is in line with the role of school climate for changing teachers' practice and improved student learning that is found in research on school effectiveness and school improvement (see Chapter 3). Given the positive impact of feedback on teachers' professional development, strengthening the link between school climate and the evaluative framework in schools could lead most teachers to feel that changing teaching practices is not only an individual but also very much a collective enterprise. In turn, this can stimulate school-wide capacity for learning and improvement.

In contrast to the important role of school factors, the impact of teacher-related factors, including teaching practices and collaboration, on professional development appears to be smaller. One reason is that, in contrast to what was expected, teachers' instructional preferences and collaboration did not correlate significantly with perceived impact. The findings do suggest that there is a relation with the number of professional development activities in which teachers participated.

The role of constructivist teaching is an interesting one. The more teachers use instructional strategies based on constructivist approaches to teaching the more they participated in different professional development activities and the more they collaborate in different activities at their school. A possible explanation might be that constructivists teaching is a relatively new approach, as compared with more structured or traditional (direct instruction) teaching methods and that teachers have only recently started to change their classroom practice. Moreover it is not an easy to adopt a constructivist approach to teaching. It requires teachers to focus on the learning and thinking activities of students, gradually transfer control of the learning process from instructors to students, stimulate the development of students' mental models and take into account the learning orientation of students (see Chapter 3). It often takes years to master a new way of teaching effectively that can positively affect student learning and motivation. Changing teaching in this direction thus requires a lot of training and opportunities for teachers to work together to solve problems, to provide feedback and information, and to assist and support. This may

explain the association found between constructivist teaching, on the one hand, and the number of professional development activities and amount of collaboration, on the other. The literature offer much evidence to show that teachers' collaboration has strong positive effects on their professional learning and can, if focused on student learning, help to improve classroom practices. The relation between collaboration and the number of professional development activities in which teachers participate corroborates these findings.

Finally, teacher background variables and school context characteristics (antecedent variables), showed a significant but small correlation with other variables in the model. Despite the weak associations, differences were detected in the role played by teacher background variables and school context characteristics in promoting teachers' professional development. Teacher background variables appeared to be important for the amount and variety of the professional development activities teachers participate in. School context characteristics instead mainly function as malleable factors for school policy and climate. Further research is needed to examine the joint effects of conditional and malleable factors at both the teacher and school level. Analysing these joint effects can increase our understanding of the effect of interactions between conditional and malleable factors on the amount, level and impact of teachers' professional development.

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Table 5.2: Descriptives per country for teacher characteristics regarding “need and participation” and “practices, beliefs and attitudes”

Countries	Number of activities		Perceived need		Days of professional development		Exchange among teachers		Professional collaboration		Structured teaching		Constructivist teaching	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	2.5	(0.03)	50.7	(0.31)	10.5	(0.17)	51.4	(0.38)	30.8	(0.53)	46.9	(0.33)	25.2	(0.27)
Belgium (Fl.)	2.3	(0.03)	47.0	(0.39)	8.0	(0.38)	51.1	(0.38)	21.4	(0.38)	51.3	(0.37)	18.9	(0.35)
Bulgaria	2.7	(0.12)	49.6	(0.59)	27.2	(1.65)	56.1	(0.63)	35.6	(0.84)	68.7	(0.65)	40.0	(0.74)
Denmark	2.6	(0.05)	44.4	(0.59)	9.8	(0.34)	64.1	(0.53)	46.7	(0.67)	42.3	(0.48)	31.4	(0.51)
Estonia	3.3	(0.04)	55.3	(0.49)	13.1	(0.29)	56.4	(0.35)	41.8	(0.58)	51.0	(0.38)	25.7	(0.40)
Hungary	2.8	(0.08)	44.7	(0.51)	14.5	(0.50)	51.6	(0.85)	32.9	(0.78)	57.2	(0.68)	24.1	(0.64)
Ireland	2.4	(0.03)	48.6	(0.48)	5.6	(0.21)	49.2	(0.45)	25.2	(0.54)	61.7	(0.41)	22.6	(0.42)
Italy	2.4	(0.03)	62.7	(0.30)	26.6	(0.98)	58.3	(0.29)	39.7	(0.56)	64.6	(0.36)	35.5	(0.39)
Lithuania	3.9	(0.04)	62.0	(0.41)	11.2	(0.21)	49.9	(0.32)	46.1	(0.51)	61.7	(0.39)	38.6	(0.52)
Malta	2.7	(0.05)	47.5	(0.57)	7.3	(0.25)	46.0	(0.62)	19.1	(0.62)	55.6	(0.60)	25.6	(0.60)
Poland	3.8	(0.04)	49.1	(0.50)	26.1	(1.10)	53.5	(0.38)	44.0	(0.53)	52.5	(0.45)	37.4	(0.40)
Portugal	2.6	(0.04)	55.9	(0.31)	18.5	(0.89)	48.2	(0.42)	27.3	(0.49)	58.9	(0.51)	29.9	(0.39)
Slovak Republic	2.7	(0.05)	48.2	(0.56)	7.2	(0.30)	54.6	(0.33)	45.6	(0.48)	56.4	(0.47)	31.9	(0.35)
Slovenia	3.0	(0.03)	57.3	(0.35)	8.3	(0.20)	59.5	(0.33)	31.4	(0.50)	51.9	(0.36)	28.4	(0.31)
Spain	2.5	(0.03)	48.8	(0.44)	25.6	(0.51)	56.9	(0.44)	21.9	(0.52)	57.9	(0.42)	28.3	(0.43)
EU (TALIS) average	2.8	(0.01)	51.5	(0.12)	14.6	(0.17)	53.8	(0.12)	34.0	(0.15)	55.9	(0.12)	29.6	(0.12)
Australia	3.3	(0.04)	44.2	(0.35)	8.7	(0.19)	63.0	(0.44)	36.2	(0.74)	49.9	(0.36)	34.5	(0.40)
Brazil	3.4	(0.05)	58.0	(0.55)	17.3	(0.70)	58.8	(0.64)	33.3	(0.75)	65.9	(0.52)	44.5	(0.59)
Iceland	3.4	(0.04)	51.5	(0.48)	10.7	(0.44)	57.0	(0.55)	30.5	(0.67)	39.7	(0.57)	29.8	(0.46)
Korea	3.9	(0.05)	69.9	(0.30)	30.0	(0.57)	54.4	(0.47)	36.4	(0.47)	54.1	(0.42)	28.5	(0.44)
Malaysia	2.8	(0.05)	72.5	(0.64)	11.0	(0.32)	54.3	(0.44)	35.5	(0.62)	56.7	(0.54)	38.7	(0.60)
Mexico	3.2	(0.04)	50.2	(0.59)	34.0	(1.60)	51.4	(0.61)	33.1	(0.68)	67.0	(0.62)	45.0	(0.57)
Norway	2.2	(0.05)	55.3	(0.51)	9.2	(0.30)	65.4	(0.39)	48.0	(0.73)	42.4	(0.46)	30.1	(0.36)
Turkey	2.8	(0.04)	42.7	(0.72)	11.2	(0.52)	40.6	(0.68)	27.9	(0.83)	57.6	(1.16)	39.2	(1.09)
TALIS average	2.9	(0.01)	52.9	(0.10)	15.3	(0.14)	54.4	(0.10)	34.4	(0.13)	55.3	(0.11)	31.9	(0.11)

Note: Possible values for perceived need, exchange among teachers, professional collaboration, structured teaching and constructivist teaching range from 0 to 100.

Table 5.3: Descriptives per country for malleable school characteristics (policy and climate)

Countries	Frequency of feedback		Consequences of feedback		School climate		Educational leadership (teacher perceptions)	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	50.0	(0.66)	12.1	(0.27)	69.4	(0.32)	47.3	(0.54)
Belgium (Fl.)	44.7	(0.69)	8.3	(0.29)	70.9	(0.28)	54.2	(0.56)
Bulgaria	61.3	(1.61)	33.7	(0.81)	70.7	(0.34)	71.7	(0.76)
Denmark	60.0	(0.96)	13.7	(0.54)	71.7	(0.40)	49.2	(0.73)
Estonia	59.7	(0.65)	26.5	(0.49)	64.9	(0.25)	58.2	(0.57)
Hungary	59.7	(1.38)	22.8	(0.56)	66.4	(0.60)	62.8	(0.95)
Ireland	38.4	(0.91)	14.2	(0.54)	73.2	(0.39)	49.9	(0.75)
Italy	28.2	(0.91)	20.0	(0.57)	70.4	(0.24)	57.9	(0.57)
Lithuania	67.2	(0.71)	32.7	(0.60)	67.2	(0.31)	66.0	(0.61)
Malta	57.6	(0.97)	12.2	(0.54)	69.4	(0.38)	61.8	(0.55)
Poland	48.0	(0.84)	33.4	(0.59)	67.6	(0.38)	70.6	(0.65)
Portugal	49.8	(1.15)	13.6	(0.37)	68.1	(0.28)	47.2	(0.74)
Slovak Republic	70.5	(0.83)	30.7	(0.60)	65.3	(0.34)	64.3	(0.59)
Slovenia	56.3	(0.63)	30.2	(0.67)	69.3	(0.24)	65.6	(0.47)
Spain	32.7	(1.04)	13.1	(0.55)	64.7	(0.33)	47.9	(0.57)
EU (TALIS) average	52.3	(0.25)	21.1	(0.14)	68.6	(0.09)	58.3	(0.17)
Australia	55.1	(0.92)	16.6	(0.45)	71.6	(0.42)	54.1	(0.74)
Brazil	55.5	(0.95)	28.8	(0.63)	67.9	(0.31)	66.4	(0.80)
Iceland	56.8	(1.08)	16.4	(0.59)	70.4	(0.33)	51.8	(0.57)
Korea	57.9	(0.60)	20.8	(0.43)	63.7	(0.27)	52.9	(0.52)
Malaysia	66.9	(0.91)	49.0	(0.78)	71.7	(0.39)	63.6	(0.66)
Mexico	66.7	(0.83)	27.4	(0.65)	71.8	(0.43)	55.9	(0.88)
Norway	52.0	(0.81)	14.1	(0.42)	78.9	(0.37)	48.4	(0.80)
Turkey	53.9	(1.31)	18.5	(0.85)	68.1	(0.60)	51.6	(1.05)
TALIS average	54.3	(0.20)	22.1	(0.12)	69.3	(0.08)	57.4	(0.14)

Note: possible values range from 0 to 100.

Table 5.4: School context and teacher background characteristics

Countries	Public schools		Private schools, 50% of more funded by the government		Private schools, less than 50% funded by the government		Index of lack of personnel of personnel		School autonomy in hiring teachers and determining salaries		Students with at least one parent who completed ISCED 3 or higher		Highest level of formal education teachers		Teacher working hours per week	
	%	(SE)	%	(SE)	%	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Austria	87.5	(1.94)	12.5	(1.94)	0.0	(0.00)	51.2	(1.62)	-0.98	(0.05)	4.3	(0.03)	2.7	(0.02)	38.1	(0.18)
Belgium (FL)	32.9	(1.42)	67.1	(1.42)	0.0	(0.00)	30.2	(1.62)	0.08	(0.03)	3.9	(0.05)	2.2	(0.02)	33.6	(0.20)
Bulgaria	98.6	(0.96)	0.0	(0.00)	1.4	(0.96)	18.6	(2.18)	0.45	(0.06)	3.4	(0.15)	3.4	(0.05)	31.9	(0.99)
Denmark	68.6	(3.14)	28.2	(3.46)	3.2	(1.76)	21.6	(1.80)	0.49	(0.08)	3.7	(0.08)	3.0	(0.01)	35.3	(0.27)
Estonia	96.4	(1.97)	3.2	(1.93)	0.4	(0.37)	43.6	(1.71)	1.01	(0.04)	3.8	(0.03)	3.3	(0.02)	36.3	(0.31)
Hungary	84.1	(3.51)	12.1	(3.54)	3.8	(3.05)	31.4	(2.30)	0.77	(0.07)	3.0	(0.11)	3.3	(0.02)	39.1	(0.32)
Ireland	45.0	(2.35)	52.9	(2.65)	2.2	(1.27)	55.3	(2.19)	-0.12	(0.03)	4.2	(0.05)	3.1	(0.01)	32.9	(0.24)
Italy	90.4	(3.13)	0.0	(0.00)	9.6	(3.13)	48.1	(2.02)	-0.94	(0.05)	3.3	(0.07)	3.6	(0.01)	28.2	(0.21)
Lithuania	98.5	(0.84)	1.5	(0.84)	0.0	(0.00)	46.0	(2.32)	0.23	(0.04)	3.3	(0.04)	3.1	(0.02)	34.4	(0.33)
Malta	51.7	(5.45)	24.1	(4.88)	24.1	(4.88)	33.3	(3.43)	-0.44	(0.10)	2.7	(0.12)	2.9	(0.02)	32.0	(0.31)
Poland	93.2	(1.81)	1.4	(0.61)	5.5	(1.82)	21.3	(1.99)	0.70	(0.05)	3.1	(0.05)	3.9	(0.01)	29.2	(0.44)
Portugal	85.2	(1.87)	6.2	(1.53)	8.6	(2.36)	49.0	(1.67)	-0.51	(0.06)	2.1	(0.06)	3.1	(0.01)	38.1	(0.24)
Slovak Republic	88.2	(3.20)	11.0	(3.16)	0.8	(0.47)	29.3	(2.46)	0.74	(0.06)	2.9	(0.07)	3.9	(0.01)	31.4	(0.31)
Slovenia	100.0	(0.00)	0.0	(0.00)	0.0	(0.00)	29.7	(1.88)	0.59	(0.04)	3.7	(0.03)	2.5	(0.01)	36.0	(0.28)
Spain	61.1	(3.61)	32.1	(3.72)	6.7	(1.56)	48.8	(1.83)	-0.65	(0.06)	2.8	(0.05)	3.8	(0.01)	32.5	(0.24)
EU average	78.8	(0.69)	16.8	(0.64)	4.4	(0.52)	37.2	(0.55)	0.09	(0.01)	3.4	(0.02)	3.2	(0.01)	33.9	(0.10)
Australia	58.5	(3.54)	33.1	(3.86)	8.4	(2.16)	34.4	(2.97)	0.05	(0.08)	3.8	(0.08)	3.2	(0.01)	41.8	(0.32)
Brazil	81.7	(0.57)	2.0	(0.79)	16.3	(0.97)	50.7	(1.88)	-0.61	(0.04)	2.0	(0.03)	2.8	(0.02)	31.1	(0.43)
Iceland	98.1	(1.19)	1.9	(1.19)	0.0	(0.00)	39.7	(2.59)	0.44	(0.07)	3.5	(0.07)	2.6	(0.02)	37.8	(0.31)
Korea	79.1	(4.03)	20.4	(4.01)	0.5	(0.53)	36.7	(2.50)	-0.63	(0.06)	4.1	(0.07)	3.3	(0.01)	38.1	(0.27)
Malaysia	98.0	(1.09)	1.5	(1.03)	0.5	(0.37)	37.6	(2.19)	-0.99	(0.03)	3.1	(0.05)	2.9	(0.01)	34.0	(0.47)
Mexico	73.9	(1.44)	6.2	(3.35)	20.0	(2.76)	59.0	(2.39)	-0.40	(0.06)	2.7	(0.07)	2.9	(0.02)	31.5	(0.55)
Norway	93.9	(2.46)	6.1	(2.46)	0.0	(0.00)	39.2	(1.94)	1.40	(0.04)	4.0	(0.05)	3.2	(0.01)	35.1	(0.25)
Turkey	94.4	(0.97)	0.1	(0.10)	5.5	(0.96)	64.5	(4.54)	-0.77	(0.09)	2.6	(0.14)	3.0	(0.01)	31.1	(0.64)
TALIS average	80.8	(0.53)	14.1	(0.52)	5.1	(0.38)	40.0	(0.49)	0.00	(0.01)	3.3	(0.02)	3.1	(0.00)	34.3	(0.08)

Note: Values for index of lack of personnel range from 0 to 100; autonomy index was set to have zero mean across all TALIS countries (s.d. = 1); educational level of parents is a five-category variable (1 = <10%; 5 > 60% at least ISCED 3); teacher education also is a five-category variable.

Table 5.5a: Standardised path coefficients; EU Member States and EU overall (figures in light grey denote non-significant effects)

	AUT	B-FL	BG	DK	EST	HUN	IRL	IT	LT	MLT	PL	PT	SVK	SLO	ESP	EU total
Effects on experienced impact																
Days of development	.180	.093	.076	.079	.186	.025	.116	.092	.095	.169	.066	.113	.121	.021	.083	.081
Number of activities	.120	.157	.188	.208	.065	.152	.163	.164	.006	.252	.144	.178	.050	.071	.241	.191
Perceived need	.268	.308	.120	.160	.322	.166	.150	.235	.260	.145	.218	.143	.204	.273	.139	.181
School climate	.262	.128	.215	.272	.213	.266	.137	.276	.251	.202	.260	.199	.219	.207	.278	.208
Consequences of feedback	.128	.123	.266	.090	.173	.092	.126	.133	.167	.048	.173	.095	.176	.192	.131	.176
Effects on number of activities																
Constructivist teaching	.067	.143	.030	.061	.125	.130	.100	.085	.114	.137	.132	.150	.090	.099	.174	.128
Professional collaboration	.155	.184	.254	.207	.252	.279	.215	.244	.298	.220	.253	.174	.205	.180	.172	.207
Consequences of feedback	.201	.192	.137	.234	.220	.187	.182	.157	.145	.143	.134	.173	.185	.155	.156	.214
Working hours	.179	.101	.075	.104	.133	.109	.117	.117	.149	.089	.100	.109	.118	.093	.118	.116
Effect on days of development																
Number of activities	.333	.210	.165	.298	.384	.322	.360	.225	.262	.297	.182	.212	.393	.262	.287	.169
Teacher education	-.117	-.004	.031	.067	.006	-.030	.043	.042	.050	-.013	.026	.069	.005	.114	.045	.099
Effects on Perceived need																
Consequences of feedback	.117	.169	.037	.065	.129	.096	.082	.095	.219	.066	.117	.019	.177	.179	.073	.130
Effects on professional collaboration																
Constructivist teaching	.378	.290	.333	.247	.253	.298	.214	.273	.291	.354	.297	.248	.275	.301	.309	.328
Consequences of feedback	.141	.182	.313	.149	.269	.255	.212	.156	.269	.196	.322	.170	.316	.214	.203	.247
Autonomy in selecting teachers	.023	.013	.013	-.149	.036	.031	-.040	-.053	-.024	.015	.039	.058	-.023	-.009	.043	.120
Effects on school climate																
Professional collaboration	.195	.138	.271	.211	.243	.227	.192	.195	.265	.120	.236	.187	.280	.143	.209	.170
Public – private school	.054	.006	-.006	.259	.067	.176	.057	.088	.083	.233	.071	.193	.048	---	.193	.170
Student background	.105	.173	.042	.103	-.011	.124	.146	.064	.036	.116	.088	-.003	.064	.012	.038	.114
Effects on consequences of feedback																
Autonomy in selecting teachers	.027	-.012	.035	.023	.026	-.014	-.068	-.015	-.016	.053	.031	-.021	.017	.059	-.018	.271
Public – private school	-.016	-.077	.007	.009	.009	-.082	-.071	.000	.031	-.048	-.059	.105	.017	---	.205	-.209

Table 5.5b: Standardised path coefficients; Non-EU Member States and TALIS overall (figures in light grey denote non-significant effects)

	AUS	BRA	ISL	KOR	MAL	MEX	NOR	TUR	TALIS total
Effects on experienced impact									
Days of development	.157	.144	.096	.162	.111	.146	.202	.106	.082
Number of activities	.164	.165	.093	.129	.089	.205	.069	.179	.160
Perceived need	.206	.081	.327	.278	.150	-.023	.267	.016	.144
School climate	.195	.169	.335	.209	.309	.263	.204	.304	.233
Consequences of feedback	.205	.139	.133	.155	.191	.106	.250	.151	.201
Effects on number of activities									
Constructivist teaching	.113	.101	.107	.098	.073	.117	.070	.143	.129
Professional collaboration	.292	.214	.247	.271	.309	.192	.163	.232	.216
Consequences of feedback	.113	.140	.122	.126	.118	.142	.277	.087	.166
Working hours	.138	.000	.229	.134	.039	.094	.069	.093	.120
Effect on days of development									
Number of activities	.367	.295	.332	.307	.271	.198	.313	.328	.208
Teacher education	.069	.037	.110	.003	.046	.067	.055	.069	.085
Effects on Perceived need									
Consequences of feedback	.062	.013	.139	.097	.190	-.003	.060	.003	.184
Effects on professional collaboration									
Constructivist teaching	.311	.349	.241	.448	.307	.305	.175	.275	.302
Consequences of feedback	.238	.275	.198	.205	.216	.293	.167	.306	.236
Autonomy in selecting teachers	.013	-.018	-.031	-.011	.003	.047	-.044	.164	.184
Effects on school climate									
Professional collaboration	.231	.342	.232	.315	.265	.282	.211	.262	.217
Public – private school	.136	.069	.030	.060	.055	.064	.035	.090	.129
Student background	.162	.081	.038	-.031	-.016	.055	.063	.122	.083
Effects on consequences of feedback									
Autonomy in selecting teachers	.113	-.087	.057	-.029	-.045	.214	-.022	.011	.076
Public – private school	-.084	.098	.077	.079	.034	-.190	.056	.227	-.127

Table 5.6: Indirect and direct effects on perceived impact

	Direct effects		Indirect effects		Total effects	
	EU only	TALIS total	EU only	TALIS total	EU only	TALIS total
Days of development	.081	.082	---	---	.081	.082
Number of activities	.191	.160	.014	.017	.205	.177
Perceived need	.180	.144	---	---	.180	.144
Constructivist teaching	---	---	.049	.046	.049	.046
Professional collaboration	---	---	.075	.085	.075	.085
School climate	.208	.233	---	---	.208	.233
Consequences of feedback	.175	.201	.074	.065	.249	.266
Teacher education	---	---	.008	.007	.008	.007
Working hours	---	---	.024	.021	.024	.021
Student backgrounds	---	---	.024	.019	.024	.019
Public – private school	---	---	-.019	-.005	-.019	-.005
School autonomy in selecting teachers	---	---	.079	.036	.079	.036

Annex 5.A1. Model development

In the first explorative phase of developing the empirical model, an initial selection of variables was made. This selection draws on the variables listed in Table 5.1 and the constructed scales. Included were those variables that either showed a non-negligible correlation ($r > .10$) with at least two of the variables they were hypothesised to affect according to the basic conceptual framework or a more sizeable correlation ($r > .20$) with at least one of these variables. Descriptive statistics for these variables are reported in Tables 5.2 to 5.4, but for school context and teacher background characteristics the tables were restricted to those variables that are included in the final model.

The next phase involved the construction of a structural model specifying the relations between the variables. In this phase 12 variables that directly or indirectly affect the experienced impact of professional development activities were maintained. For the construction of the model only the data that relate to the 15 EU Member States participating in TALIS were used. The data set was split up into two parts of equal size using a random selection procedure. The first half was used to develop a structural model that fits the data. This model development approach can be described as a theoretically guided exploration of the data. The second half of the dataset was used to test whether the model developed through exploration of the first part also fits the other half of the data set.

The model development activities were split up into different stages, in which the model was gradually extended. The first stage involved the construction of an initial model that included only experienced impact of professional development as the dependent variable and variables from the category "need for and participation in professional development" as explanatory variables. Experienced impact was modelled as a latent variable, measured indirectly through the experienced impact of seven specific activities as reported by teachers. The teacher responses are considered to be reflections of the generally experienced impact of professional development. The latent variable "experienced impact" is modelled to determine the observed teacher responses. Thus the model presents a combination

of a measurement model and a structural model. The estimated effects (factor loadings) of the latent variable on the teacher responses for each of the seven activities are listed in Tables 5.A2.3 and 5.A2.4.

The factor loadings reported in Tables 5.A2.3 and 5.A2.4 relate to the estimates obtained when fitting the final version of the model. Outcomes reported are based on the findings across the 15 EU Member States that participated in TALIS and also on the overall findings across all participating countries. Results per country are reported as well. The findings show that the experienced impacts of all seven professional development activities contribute to a similar extent to the latent variable that reflects the experienced impact in general. The contribution of attending courses and workshops and conferences and seminars is relatively strong, whereas the contribution of individual and collaborative research is more modest. It is also important to note that the figures in Tables 5.A2.3 and 5.A2.4 indicate that the measurement model for experienced impact produces very similar estimates across countries. This suggests that the underlying structure of the latent variable is basically the same across countries.

The first stage also involved the exploration of the relations of experienced impact with need for and participation in professional development. The effects of three variables on experienced impact were investigated, namely perceived need (an index based on 11 items expressing need for professional development in different domains), number of days of professional development during the previous 18 months (this can be considered an indication of the *amount* of professional development) and number of different activities participated in during the previous 18 months (this can be considered an indication of the *variation* in professional development activities). All direct effects of these variables on experienced impact are maintained in the model, regardless of their estimated size. This was done because these variables are the most proximal to experienced impact in the conceptual framework (Figure 5.1). Other relations were only maintained in the exploratory model if their size exceeded .10 (or fell below -.10) when expressed as a standardised effect. In this stage the relations between the three explanatory variables were explored as well.

Although the amount and variation of professional development may be closely linked, the distinction between the two is believed to be highly relevant. A teacher who participates in several kinds of professional development activities is likely to attend more days of professional development. However, it seems plausible that the impact of an extra day is stronger if it entails a new kind of activity. If a teacher has already attended several conferences, the impact of attending one more conference may be quite limited, whereas the impact of a new kind of professional development activity may be much stronger. Diversity in learning experiences is likely to increase the impact of professional development. Participation in professional development is therefore measured not only in terms of amount (number of days attended) but also in terms of variation (number of distinct activities).

In the second stage the model was extended through inclusion of variables from the category “teacher practices, beliefs and attitudes”. Two variables from this category showed standardised effects larger than .10 on variables from the category “need and participation”. These are constructivist teaching and professional collaboration. Two variables seemed promising on the basis of bivariate correlations with other variables, but did not produce standardised effects larger than .10. These variables relate to structured teaching and exchange among teachers. An example item measuring structured teaching is “I check, by asking questions, whether or not the subject matter has been understood.” Exchange was measured through teacher responses to an item that relates to the frequency of attending staff meetings to discuss the vision and mission of the school.

In the third stage two variables from the category “school policy and climate” were added to the model. These include school climate and consequences of feedback. Both variables show a direct effect on experienced impact and effects on variables from the category “need and participation”. At this stage some relations were established between variables from the “school policy and climate” category with variables from the “teacher practices, beliefs and attitudes” category. Two other variables from the school policy and climate category were considered initially for inclusion in the model, but rejected in the end: “frequency of feedback” and

“educational leadership by the principal as perceived by the teachers”.

The fourth stage involved the effects of teacher background variables. Teacher education and working hours were found to affect variables from the “need and participation” category. Other variables from this category that were considered, but eventually not included in the model, are “teacher experience” and “gender”.

The fifth stage of the model construction involved the effects of school context characteristics. Three school context variables were found to exert substantial effects on school policy and climate variables. These are “school autonomy with regard to selecting teachers and determining salaries”, “student background characteristics” and “school type (public vs. private)”. Several other context variables were considered for inclusion, but failed to show effects of sufficient size. These include other aspects of school autonomy (with regard to financial matters, student policies and curriculum), urbanicity, school enrolment, average class size, student-teacher ratio, lack of school personnel and behaviour problems such as absenteeism (among both students and teachers).

The model thus constructed through theoretically guided exploration of a randomly selected half of the dataset was then fitted to the other half. To develop and test the measurement and structural model, multilevel covariance structure analysis with two levels (teacher and country) was conducted first (*Mplus3*; Muthén and Muthén, 2004). It appeared that this did not produce satisfying and significant results, probably owing to the small number of countries included. Therefore the model was tested again at the level of teachers, using *Mplus3*. Ignoring the nested structure of the data, however, would lead to incorrect results. That is, standard errors would be underestimated, leading to a higher type I error rate (i.e. finding a parameter significant when it is actually zero in the population). Thus standard errors were corrected for clustering of teachers within countries. Furthermore, in order to correct for overrepresentation and underrepresentation of certain groups of teachers, a weighting procedure was conducted to ensure that within countries all teachers are represented appropriately. The weighting procedure also ensures that all countries have the same weight in the overall analyses regardless of their size.

Annex 5.A2. Technical Annex

Latent and observed variables concerning experienced impact

The arrows departing from the latent variable “experienced impact” in Figure 5.1 denote that teachers’ reported impact of the specific professional development activities are considered to be caused by the experienced impact of professional development in general as measured in the survey.

Teachers were not asked to report on experienced impact of professional development in general, but only with respect to concrete activities. The generally experienced impact must therefore be inferred from the more specific responses. The conceptual model behind this approach is that the observed responses result from the experienced impact. The strength of the estimated effects of the latent variable on the observed responses in our analysis provide an indication of the empirical validity of this conceptualisation.

Reliability indices and factor loadings

Table 5.A2.1: Reliabilities (Cronbach’s alpha) of constructed scales; EU Member States

Scale	Items	AUT	BFL	BGR	DNK	EST	HUN	IRL	ITA	LTU	MLT	POL	PRT	SVK	SVN	ESP	EU total
Perceived need	11	.76	.87	.85	.80	.83	.83	.82	.83	.81	.82	.80	.77	.84	.79	.84	.83
Structured teaching	9	.70	.70	.72	.72	.73	.68	.69	.74	.74	.66	.73	.75	.77	.74	.74	.74
Constructivist teaching	10	.80	.75	.83	.76	.78	.76	.72	.77	.83	.77	.80	.78	.81	.77	.78	.81
Exchange	7	.73	.65	.55	.71	.69	.70	.71	.68	.66	.67	.72	.70	.73	.71	.64	.66
Collaboration	5	.66	.50	.60	.66	.63	.68	.56	.59	.69	.63	.71	.57	.71	.65	.60	.66
Feedback frequency	2	.70	.63	.67	.61	.72	.77	.77	.82	.75	.68	.73	.80	.75	.70	.86	.76
Feedback consequences	7	.71	.71	.77	.74	.81	.79	.79	.77	.81	.77	.80	.69	.82	.86	.79	.82
School climate	10	.77	.81	.79	.82	.74	.78	.83	.82	.79	.82	.79	.76	.75	.74	.79	.79
Educational leadership	11	.88	.85	.90	.86	.87	.85	.89	.88	.91	.88	.90	.89	.89	.87	.90	.90
Lack of personnel	4	.60	.74	.72	.56	.69	.53	.72	.59	.79	.70	.66	.61	.72	.72	.65	.72
Behaviour problems	14	.88	.89	.87	.94	.80	.88	.89	.91	.93	.93	.90	.90	.83	.91	.95	.92

Explanation of acronyms:

AUT = Austria; BFL = Belgium (Fl.); BGR = Bulgaria; DNK = Denmark; EST = Estonia; HUN = Hungary; IRL = Ireland; LTU = Lithuania; MLT = Malta; POL = Poland; PRT = Portugal; SVK = Slovak Republic; SVN = Slovenia; ESP = Spain; AUS = Australia; BRA = Brazil; ISL = Iceland; KOR = Korea; MYS = Malaysia; MEX = Mexico; NOR = Norway; TUR = Turkey

Table 5.A2.2: Reliabilities (Cronbach’s alpha) of constructed scales; Non-EU and TALIS total

Scale	Items	AUS	BRA	ISL	KOR	MYS	MEX	NOR	TUR	TALIS total
Perceived need	11	.83	.87	.84	.85	.89	.89	.82	.87	.85
Structured teaching	9	.72	.79	.75	.82	.87	.76	.73	.79	.77
Constructivist teaching	10	.78	.85	.73	.90	.87	.79	.69	.89	.82
Exchange	7	.68	.81	.70	.72	.72	.73	.64	.81	.70
Collaboration	5	.74	.74	.71	.81	.76	.68	.63	.72	.68
Feedback frequency	2	.71	.79	.78	.74	.78	.66	.69	.76	.75
Feedback consequences	7	.79	.82	.84	.84	.88	.81	.75	.77	.84
School climate	10	.83	.82	.76	.79	.84	.82	.75	.84	.80
Educational leadership	11	.90	.92	.91	.91	.92	.93	.88	.93	.90
Lack of personnel	4	.83	.76	.67	.77	.85	.74	.75	.82	.75
Behaviour problems	14	.89	.90	.88	.97	.95	.95	.87	.96	.92

Table 5.A2.3: Factor loadings on experienced impact; EU Member States and EU total

	AUT	B-FL	BG	DK	EST	HUN	IRL	IT	LT	MLT	PL	PT	SVK	SLO	ESP	EU total
Courses and workshops	.621	.590	.695	.576	.565	.586	.630	.625	.620	.613	.629	.604	.623	.616	.679	.651
Education conferences and seminars	.546	.580	.725	.611	.518	.560	.655	.624	.563	.633	.605	.589	.592	.658	.671	.644
Qualification programme	.501	.418	.630	.593	.452	.534	.534	.428	.481	.506	.529	.510	.495	.366	.438	.512
Observation visits to other schools	.505	.542	.630	.513	.484	.534	.484	.493	.495	.455	.529	.494	.584	.389	.570	.563
Professional development network	.524	.549	.678	.546	.516	.576	.560	.575	.568	.584	.567	.536	.563	.528	.631	.616
Individual and collaborative research	.436	.441	.515	.498	.409	.495	.445	.486	.419	.463	.473	.468	.412	.328	.488	.459
Mentoring and peer observation	.491	.488	.639	.386	.494	.587	.426	.496	.508	.511	.531	.503	.568	.459	.643	.556

Table 5.A2.4: Factor loading on experienced impact; Non-EU and TALIS total

	AUS	BRA	ISL	KOR	MAL	MEX	NOR	TUR	TALIS total
Courses and workshops	.631	.746	.557	.661	.688	.668	.562	.736	.662
Education conferences and seminars	.599	.690	.525	.667	.672	.635	.564	.753	.657
Qualification programme	.465	.624	.490	.545	.568	.583	.499	.627	.549
Observation visits to other schools	.520	.609	.506	.584	.588	.579	.519	.641	.560
Professional development network	.545	.664	.538	.571	.635	.603	.515	.699	.599
Individual and collaborative research	.464	.529	.440	.503	.448	.517	.458	.586	.488
Mentoring and peer observation	.533	.633	.524	.586	.630	.620	.496	.664	.570

Model fit indices

For evaluation of model fit literally dozens of fit indexes are described in the statistical literature (Kline, 2005). The results of a number of model fit tests with regard to our model are reported in Table 5.A2.5. An index reported in virtually all reports involving structural equation modelling is the χ^2 -statistic. If the corresponding p-value (given the degrees of freedom) exceeds a certain criterion (e.g. $p > .05$) the model can be accepted. The main problem with this statistic is its strong dependence on sample size. Large samples are quite unlikely to produce large p-values. When dealing with a sample of significant size, as in this case, the chances of obtaining a p-value large enough to accept the model are quite slim. Still χ^2 -values are nearly always reported, also because nearly all alternative fit indices are (partly) based on the χ^2 -value. An alternative fit index is the comparative fit index (CFI), which assesses the relative improvement in fit of the model tested in comparison with a model that assumes zero covariances among the observed variables. A CFI score larger than .90 is generally considered to indicate a reasonably good fit. When testing our model on the dataset that relates to EU Member States this criterion not met (CFI = .870) and even less so when all TALIS countries are taken into account (CFI = .809). However, it can be argued that in a field where empirically tested causal models are largely absent, lower CFI scores may still represent a significant improvement.

The results look more favourable with regard to two other frequently used fit indices. The standardised root mean square residual (SRMR) is based on differences between observed and predicted covariances. Values below .10 are generally considered to indicate an acceptable fit. The root mean squared error of approximation (RMSEA) is the fourth example of a widely applied model fit index. With regard to this index, values below .05 are considered acceptable. An important property of the RMSEA is that its formula includes a built-in correction for model complexity (Kline, 2005). As a result the model fit will not automatically improve by introducing more relations into the model.

Table 5.A2.5: Tests of model fit

	EU Member States	All TALIS countries
χ^2 -value	772.558	744.741
Degrees of freedom	129	129
p-value	.000	.000
CFI	.870	.809
RMSEA	.015	.007
90% confidence interval	.014-.016	.007-.008
SRMR	.048	.045

Another indication of the empirical validity of the model is its explanatory power with regard to variation in the experienced impact of professional development. Table 5.A2.6 reports the proportion of variance explained by our model. Across all TALIS countries the model can account for 19.1% of the variance in experienced impact. Virtually the same percentage applies to the data that relate exclusively to the 15 EU Member States. The per country percentages range from 13% for Ireland to 29% for Iceland.

Table 5.A2.6: Proportion of explained variance (R²) for experienced impact per country

Country	Variance explained (R ²)
Austria (AUT)	.245
Belgium (FL) (BFL)	.194
Bulgaria (BGR)	.220
Denmark (DNK)	.189
Estonia (EST)	.269
Hungary (HUN)	.154
Ireland (IRL)	.131
Italy (ITA)	.217
Lithuania (LTU)	.200
Malta (MLT)	.193
Poland (POL)	.209
Portugal (PRT)	.137
Slovak Republic (SVK)	.178
Slovenia (SVN)	.224
Spain (ESP)	.191
EU total	.192
Australia (AUS)	.228
Brazil (BRA)	.139
Iceland (ISL)	.294
Korea (KOR)	.234
Malaysia (MYS)	.216
Mexico (MEX)	.180
Norway (NOR)	.266
Turkey (TUR)	.205
TALIS total	.191

Teachers' professional development in countries that did not take part in TALIS

6.1 Introduction

Twenty-four countries participated in the first round of the OECD Teaching and Learning International Survey (TALIS). Nineteen of these belong to the EU, are candidate countries to EU membership or are countries belonging to the European Economic Area (EEA countries). Nine EU countries, two candidate countries and two countries belonging to the European Economic Area did not participate in the TALIS Survey.

This chapter gives an overview of teachers' professional development in EU countries, EU candidate countries and EEA countries that did not take part in the first round of the TALIS survey, as well as in one major economy outside the EU (China). The overview is based on existing data at national level. The key issues on which data were collected and interpreted are similar to those covered by TALIS, namely the amount, type and perceived impact of teachers' professional development, support that teachers receive for professional development, and the perceived need for and barriers to participation. Data on induction and mentoring are collected and interpreted as well.

Methodology

To access data in countries that did not take part in the first round of the TALIS study, the required information was requested from a national respondent in each country and additional information was sought in the international literature and on the Internet.

Different data sources were studied (national statistics, national and international teacher sample surveys, research articles and reports). National contact persons willing to co-operate were found in the following countries: Cyprus, the Czech Republic, Finland, France, Germany, Greece, Liechtenstein, the Netherlands, Sweden, the United Kingdom (England and Scotland), Switzerland and China.

A short survey asked national contact persons to investigate the availability of national-level data on professional development for each area covered in the TALIS survey, namely:

- amount, type, and perceived impact of teachers' (formal and informal) professional development
- support for professional development
- the perceived need for professional development
- barriers for participation in professional development
- mentoring and induction of new teachers.

In addition, information was requested on the type of data sources, the publication date, the language in which the information was published and the reference period.

The quick survey preceded a telephone interview in which more in-depth information was requested

on the available data sets and the congruence with the TALIS data. Attention was also paid to the additional information found in the international literature and on the Internet.

If the interview showed that data on teachers' professional development were available in a country, and depending on the language of the publications, the national contact person was asked either to report on the data available or to send the reports and statistics to the research team. In the latter case the research team analysed the data and tried to compare them as much as possible with the areas and items of the TALIS survey.

Chapter overview

This chapter provides information on the amount, type and perceived impact, and the need for and barriers to teachers' professional development in countries that did not participate in the first round of the TALIS survey (section 6.2). Information on induction and mentoring of new teachers in these countries is provided in section 6.3. Sections 6.2 and 6.3 present the information collected country by country. For each country the policy context is described, the data sources and data collection methodology are reported and the main findings summarised. The description of the policy context follows the Eurydice country reports on national education systems as closely as possible.

Section 6.4 draws together the information from the preceding sections. To the extent possible, TALIS and non-TALIS countries are compared.

In sections 6.2 and 6.3 the individual country tables are included in the text. The summary tables for section 6.4 are grouped at the end of the chapter.

6.2 Continuous professional development in selected EU countries that did not participate in the first round of TALIS

TALIS adopted a broad definition of professional development among teachers: "Professional development is defined as activities

that develop an individual's skills, knowledge, expertise and other characteristics as a teacher" (OECD, 2009).

According to the definition, professional development can be provided in many ways, varying from informal activities such as reading professional literature and engaging in informal dialogue with peers to (more) formal activities such as attending courses, workshops and formal qualification programmes, participation in networks with teachers from other schools or participation in individual or collaborative research. In the TALIS study, mentoring and/or peer observation and coaching are also seen as professional development (OECD, 2009).

TALIS asked teachers about their professional development activities, their impact, the support they received, the extent to which teachers wanted more professional development than they had participated in, the barriers that had prevented them for doing so, and the areas of greatest development need. The reference period chosen was the 18 months prior to the survey.

The following presents an overview of professional development of teachers in EU countries and major economies that did not participate in the first round of TALIS and for which data on professional development are available. These countries are listed above.

Cyprus

Policy context

Professional development training provision in Cyprus is mainly informal, individual and voluntary and has not evolved into structured practices. The education legislation only makes reference to the possibility that "teachers could be asked to attend series of educational courses so as to improve their ability to respond to their duties" (OELMEK, 2004, p. 57). Moreover, teachers need to meet no specific requirements for professional development in order to keep their jobs. There are no agreed standards for professional development

training programmes and participation in courses does not have a significant impact on promotion (Karagiorgi and Symeou, 2006). Compulsory programmes are only provided for newly appointed primary and secondary head teachers and newly appointed primary and secondary deputy head teachers (Eurybase, The Education System in Cyprus, 2007/08).

The Cyprus Pedagogical Institute (CPI) is the official source of teachers' professional development and provides training at its own premises or in schools. Professional development may also be provided by professional organisations (such as the Association of Teachers of English/French or the Mathematical Association), which organise programmes for their members, universities and inspectors. These organisations offer professional development for teachers of their subjects, in order to inform them of policies, reforms in curricula and new didactic approaches.

Methodology

The data presented below are drawn from national statistics and national sample surveys (Karagiorgi and Symeou, 2007; Michaelidou and Martidou, 2008).

A national survey was conducted in 2005 by the Cyprus Pedagogical Institute as part of a larger project on teachers' current training needs and evaluation of teachers' development. The overall goal of the survey was to identify in-service training needs for teachers at different school levels (Karagiorgi and Symeou, 2007).

A proportional stratified sample of schools of all levels of primary and secondary education was drawn. Questionnaires were sent to school heads and teachers. Questionnaires were returned from 71 of the 104 schools included in the sample (68%). Return rates for teachers were 765 out of 1 497 (51%). Data are available for teachers at the primary level [pre-primary (3-6 years), primary (6-12 years)] and the secondary level [gymnasium (12-15 years), lyceum (15-18 years) and technical-vocational education (15-18 years)]. The reference period is 2004/05.

In 2008 a second survey was administered to a random representative sample of teachers of all levels in primary and secondary education. The survey was meant to evaluate teachers' beliefs and attitudes towards professional development and lifelong learning. The sample in the second study consisted of 619 teachers, 219 (42%) from primary education, 301 (48%) from secondary education and 47 (8%) from technical and vocational education. The study was based on a mixed method approach, combining interviews in a pilot study and a questionnaire as the main research method. The questionnaire investigated teachers' views on current opportunities for professional development, reasons for participating in professional development, obstacles to engaging in professional development, themes and topics on which they need professional development, and professional development and lifelong learning skills and competences. The reference period for this second survey is 2007/08.

Evidence

Types of professional development undertaken

Teachers who participated in the surveys were asked to indicate the training activities in which they were involved during the relevant school years. As shown in Table 6.1, in 2007/08 (2004/05 in brackets) 48.1% of teachers (53.7%) stated having attended seminars with their school inspectors, 41.4% (35.5%) participated in conferences, and 40.9% of teachers attended optional seminars offered by the Cyprus Pedagogical Institute.

Barriers to participating in professional development

According to teachers, lack of time is the main reason for not participating in more professional development activities. Almost 70% of teachers reported a high or very high degree of lack of time is an obstacle to participation in (more) professional development (Table 6.2). Lack of information on the activities was reported as an obstacle to participation to a high or very high degree by 41%.

Table 6.1. Types of professional development undertaken by teachers, 2004/05 and 2007/08

Number and percentage of lower secondary teachers (gymnasium) and all teachers (primary and secondary level) undertaking specified professional development activities

Type of professional development activity	2004/05 school year				2007/08 school year	
	Gymnasium teachers (lower secondary education) N= 206		All teachers (primary and secondary education) N= 765		All teachers (primary and secondary education) N= 619	
	N	%	N	%	N	%
Inspectors' seminars	136	66.0	411	53.7	298	48.1
Conferences	36	23.8	272	35.5		
Conferences/seminars out of the ministry					253	40.9
Conferences/seminars abroad					127	21.0
Optional seminars (CPI)	47	22.8	179	23.4	256	41.4
Other seminars (CPI)	29	14.1	131	17.1	39	6.3
Postgraduate programmes	7	3.4	55	7.2	60	9.7
Graduate programmes					8	1.3
Undergraduate programmes	6	2.9	21	2.7		

Table 6.2. Main reasons for not participating in more professional development, 2007/08

Percentage of primary and secondary teachers reporting the following factors as obstacles to undertaking more professional development

To what degree are the following factors obstacles for your participation in professional development?	To a very low degree	To a low degree	To a moderate degree	To a high degree	To a very high degree
Lack of time	4.5%	7.3%	19.5%	30.6%	38.0%
Places and rooms of the activity taking place	13.7%	25.6%	28.0%	17.7%	15.0%
Lack of information about the activity	10.3%	21.6%	27.0%	24.8%	16.2%
Unsatisfactory level	7.8%	27.9%	30.1%	22.1%	12.1%

Impact of professional development

In the 2005 survey, teachers were asked to choose the two most important outcomes of professional development activities from a list of ten possible items. The analysis of their responses (Table 6.3) shows that acquisition of new skills and improvement of their own professional knowledge is the primary goal of professional development activities, followed by improving school practice. Thus, teachers' concerns when attending professional development activities in the 2004/04 school year referred both to their own professional development and the improvement of school practice.

Professional development needs

Both in 2005 and 2008 teachers were asked to indicate their priorities for professional development. In 2005, the areas of greatest interest to teachers were students' motivation for learning, computer and information technology, new methods and forms of teaching, and educational innovations and original educational programmes.

In 2008, the questions were stated differently. In 2008, teachers were first asked to indicate their priorities for professional development in general from a list of specified subjects, and in a second question

to report on their priority needs with regard to teaching and classroom practice. Concerning the general aspects of education, educational psychology, the European dimension in education, civic education, and curriculum development in school seem to have

the highest priority (Table 6.4). With regard to teaching and classroom practice, behavioural problems – delinquency, differentiation of teaching and ICT in education – were rated as the main areas of high development need (Table 6.5).

Table 6.3. Expected impact of professional development activities, 2004-05

Number and percentage of secondary teachers and all teachers (at primary and secondary level) reporting main expected impact of professional development activities

What are your expectations concerning the impact of professional development training?	All teachers (primary and secondary education) (N = 765)		Secondary teachers (N = 468)	
	N	%	N	%
Improving own knowledge	369	48.2	210	44.9
Improving my students' knowledge	164	21.4	109	23.3
Getting new skills	381	49.8	234	50.0
Exchange of experience	190	24.8	134	28.6
Getting formal qualifications	29	3.8	19	4.1
Getting additional qualifications	149	19.5	93	19.9
Editing articles	18	2.4	13	2.8
Meeting new people	24	3.1	16	3.4
Improvement of school practice	335	43.8	168	35.9
Others	6	0.8	6	0.8

Table 6.4. Teachers' professional development needs, 2007/08

Number and percentage of all teachers (at primary and secondary level) indicating priorities for professional development and training in specified general areas

Priorities for professional development and training: general areas	All teachers (primary and secondary education) (N=619)	
	N	%
European dimension of education – civic education	224	36.2
Curriculum development at the school level	231	37.3
Philosophy of education	52	8.4
Educational psychology	265	42.8
Sociology of education	57	9.2
History of education	9	1.5
Intercultural education	211	34.1
Parental involvement in education	117	18.9
School leadership and management	210	33.9
Student assessment	195	31.5
Foreign languages teaching	103	16.6
Other	14	2.3

Table 6.5. Teachers' professional development needs, 2007/08

Number and percentage of all teachers (at primary and secondary level) indicating priorities for professional development in specified areas of teaching and classroom practices

Topics – priority needs for professional development and training on teaching and classroom practices	All teachers (primary and secondary education) N= 619	
	N	%
Greek as a second language	72	11.6
Co-operative learning	166	26.8
Differentiation in teaching – mixed ability classes	271	43.8
Curriculum development in school	143	23.1
Learning difficulties	210	33.9
Action research	104	16.8
Behavioural problems – delinquency	348	56.2
Literacy and numeracy	82	13.2
Inclusive education	85	13.7
ICT in education	261	42.2
Special subject matters	72	11.6

Czech Republic

Policy context

In the Czech Republic, the Act on Educational Staff stipulates an obligation for teachers in public and state schools to take part in professional development but does not prescribe an obligatory form. Professional development is meant to renew, supplement or enhance qualifications, to extend them or to enable staff to acquire qualifications.

In primary and lower secondary education, the school head has to create conditions for professional development in accordance with a plan developed after negotiations with a relevant trade union body which takes into account the interests and needs of the educational staff, the school and its budget. Professional development is organised by higher education institutions and institutions for professional development of educational staff on the basis of accreditation granted by the Ministry of Education. Teachers can also undertake self-study. In this case, teachers are entitled to 12 working days for study in the school year and to salary equal to the amount of lost earnings, if operational factors allow this (Eurybase, The Education System

in Czech Republic, 2007/08; Ministry of Education, Youth and Sports of the Czech Republic on the occasion of the Czech presidency of the EU Council, 2009).

Methodology

The Czech School Inspectorate (CSI) is the central body responsible for monitoring schools and school facilities. In addition, in 2007/08 the Czech School Inspectorate conducted research on ten topics, one of which was professional development of teachers. The CSI issued a report on each topic. A summary of these reports was included in the *Annual Report of the Czech School Inspectorate on the School Year 2007/2008* (Czech School Inspectorate, 2009).

The data are based on visits to 314 kindergartens, 546 basic schools (comprising primary and lower secondary education), and a number of upper secondary schools in all regions of the Czech Republic.¹

The reference period is 2007/08.

¹ The report is in Czech. A summary is presented in the Annual Report of the Czech School Inspectorate on the School Year 2007/2008 (Czech School Inspectorate, 2009).

Evidence

Participation in professional development and types of professional development undertaken

In the Czech Republic, teachers' participation in professional development activities differs across the 14 regions. The average proportion of teachers participating in professional development in 2007/08 was highest in the Pilsen Region (65%) and lowest in the Karlovy Vary Region (48%). Teachers in basic schools took the largest share of professional development courses and seminars (around two-thirds of all participants). The relative share of participants was higher from schools established by municipalities or regions than from private or church schools.

In 2007/08, the content of professional development for basic education teachers was oriented towards key competences in basic schools and particular attention was paid to mathematical and reading literacy.

Professional development needs

Teachers' needs are for courses aimed at developing school education programmes, language or ICT education, and seminars on innovation in an educational content.

Barriers to participation in more professional development

The largest obstacles to participation in further education include the lack of financial resources, problems in covering for missing teachers in classes, and difficulties for transport from smaller municipalities (Czech School Inspectorate, 2009).

Finland

Policy context

In Finland, professional development of teaching staff is considered the responsibility of education providers (usually local authorities) and of

individual teachers. Education providers have an obligation to provide teachers with a minimum of three days of continuing professional development every year. This training is provided free of charge for teachers, who also receive full pay for their training days (Eurybase, The Education System in Finland, 2007/08; Education and Science in Finland, 2008).

In addition to self-motivated professional development (in which teachers take responsibility for participating in professional development) and professional development at educational institutions (which is the responsibility of the education provider), there is also government-funded professional development, which is important in terms of education policy. The aim of government-funded professional development is to provide training for 13 000 teachers and principals a year (Eurybase, The Education System in Finland, 2007/08; Education and Science in Finland, 2008).

Methodology

Data on the number of teachers who participate in professional development activities are collected by Statistics Finland (Opetushallitus, 2008) and the National Board of Education (2008).

The National Board of Education collects data on government-funded professional development. The data collected by Statistics Finland refer to all types of professional development activities and cover teachers at all levels of the education system. For the purpose of this report the subgroup of all primary and secondary teachers – primary, lower secondary and upper secondary general education (basic education and gymnasium)] is relevant as is the subgroup of subject teachers. Subject teachers are the category of teachers who usually teach in grades 7-9 in basic education (comparable to lower secondary education in TALIS, ages 13-15) and/or in gymnasium (general upper secondary education). Data on participation in professional development are available for 2007 and 2005, and will be collected again in 2010 and 2013.

Evidence

Level and intensity of participation in professional development activities

In the first half of 2008, 6 538 teachers and principals (all levels of education) participated in government-funded professional development (National Board of Education, 2008).

Tables 6.6, 6.7 and 6.8 present data from Statistics Finland on subject teachers and all teachers in basic education and gymnasium. Table 6.6 shows that, in 2007, 68% of all teachers and 71% of subject teachers in basic education and gymnasium participated in professional development. The rate of non-participation was 32% (all teachers) and 29% (subject teachers).

The 13 047 subject teachers who participated in education and training in 2007 spent a total of 102 270 days on continuing professional development. This is an average of 7.8 days of professional development for each subject teacher participating in professional development (Table 6.7). Taking into account the subject teachers who did not participate in professional development, the average number of days spent by subject teachers is lower (5.5 days on average).

The average number of days spent on professional development by all teachers who participated

in professional development in 2007 is 9.1 days. Including teachers who did not participate gives an average of 6.2 days.

In total, subject teachers who participated in professional development spent 53 372 days on professional development (4.1 days on average) during working time and 48 898 days (3.7 days on average) after working time. All teachers who participated in professional development spent 153 162 days on professional development (4.6 days on average) during working time and 148 769 days (4.5 days on average) after working time.

The intensity of participation of subject teachers and all teachers is influenced by the type of professional development undertaken (Table 6.8). More than one-third of total professional development days is spent on activities organised by the employer (on average 2.8 days per subject teacher and 3.1 days per teacher) and another third on other professional development activities (on average 2.8 days per subject teacher and all teachers). Relatively fewer days are devoted to professional development activities leading to qualifications and degree programmes. For these two types of professional development most days are spent after working time, while the time devoted to professional development activities organised by the employer is mainly spent during working time.

Table 6.6. Teachers' participation in continuing professional development (subject teachers and all teachers in basic education and gymnasium), 2007

Basic education and gymnasium	Total number of teachers	Participation in professional development		Non-participation in professional development	
		Number of teachers	%	Number of teachers	%
Subject teachers	18 501	13 047	71	5 454	29
All teachers	48 309	32 988	68	15 321	32

Teachers in Finland do not participate equally in continuing professional development throughout the country (Piesanen, Kiviniemi and Valkonen, 2006, 2007; Eurybase, The Education System in Finland, 2007/08). According to a national sample survey in 2005, the participation rate is lower in northern Finland, and in rural municipalities. From

the 2005 survey it appeared that obstacles to participation included inaccessibility, inappropriateness of the programme, lack of content related to own needs, and issues of motivation and attitude. Furthermore, different municipalities have different resources and possibilities to plan and provide professional development.

Table 6.7. Total number of days spent on continuing professional development (average number of days per teacher in brackets) (subject teachers and all teachers in basic education and gymnasium who participated in education and training), 2007

Basic education and gymnasium	Number of teachers participating in professional development	All types of professional development		
		Total number of days (average number of days per teacher)	During working time (average number of days per teacher)	After working time (average number of days per teacher)
Subject teachers	13 047	102 270 (7.8)	53 372 (4.1)	48 898 (3.7)
All teachers	32 988	301 931 (9.2)	153 162 (4.6)	148 769 (4.5)

Table 6.8. Days spent on different types of continuing professional development (average number of days per teacher between brackets) (subject teachers and all teachers in basic education and gymnasium who participated in education and training), 2007

Basic education and gymnasium	Training leading to qualification			Degree leading programmes		
	Number of days (average number of days per teacher)			Number of days (average number of days per teacher)		
	Total	During working time	After working time	Total	During working time	After working time
Subject teachers	18 285 (1.4)	2 274 (0.2)	16 011 (1.2)	10 665 (0.8)	884 (0.1)	9 781 (0.7)
All teachers	67 322 (2.0)	10 207 (0.3)	57 115 (1.7)	39 925 (1.2)	3 859 (0.1)	36 066 (1.1)
	Continuing professional development organised by the employer			Other professional development activities		
	Number of days (average number of days per teacher)			Number of days (average number of days per teacher)		
	Total	During working hours	After working hours	Total	During working hours	After working hours
Subject teachers	37 045 (2.8)	28 823 (2.2)	8 222 (0.6)	36 275 (2.8)	21 391 (1.6)	14 884 (1.1)
All teachers	102 995 (3.1)	80 109 (2.4)	22 886 (0.7)	91 689 (2.8)	58 987 (1.8)	32 702 (1.0)

France

Policy context

In France, article L. 912-1-2 of Chapter VI of the framework and programme law for the future of schools of 23 April 2005 states that when a teacher seeks training for the purpose of personal advancement and receives approval from the *recteur de l'académie*,² the training takes place outside required teaching hours and may qualify for compensation. Professional development should take into account the teacher's career management (Eurybase, The Education System in France, 2007/08).

Academic authorities are in charge of the professional development of permanent teachers. It is up to the rector to define the academic plan for continuing professional development (PAF). The rector determines priorities according to teachers' training specifications, as defined by the order of 19 December 2006, which is the foundation of the PAF.

The *recteur d'académie*, along with the university chancellor, guarantees the match between the initial training plan established by the university and the academic training plan, which stipulates the continuing professional development of secondary education teachers.

Methodology

Since 1991, la Direction de l'Evaluation, de la Prospective et de la Performance (DEPP) has carried out surveys of panels or samples of teachers. In September-October 2005, the DEPP administered a survey to a sample of 1 200 secondary education teachers who were representative, at the national level, with respect to age, sex and stock of teachers as regards recruitment exam or certificate. The survey consisted of 96 questions in four areas (completed education, perceptions of the teaching profession, conditions of work, and initial training and professional development). In total,

2 Académie: an administrative district of the French national education system, in which the decentralised services of the education ministry are under the responsibility of a *recteur*. The *recteur* is responsible for the entire education department in his constituency. France is divided into 28 académies.

1 101 secondary teachers completed the survey. The data refer to the years 2002/03, 2003/04 and 2004/05 (Cambe and Branellec, 2006).

Evidence

Level and intensity of participation in professional development activities

The percentage of teachers participating in professional development in 2002/03, 2003/04 and 2004/05 was 69%. Approximately half of the participating teachers spent less than three days on courses in a year (Table 6.9).

Table 6.9. Total number of days of professional development undertaken by teachers, 2002/03, 2003/04 and 2004/05

	2002/03	2003/04	2004/05
Sample	506	534	567
Less than 3 days	53%	52%	49%
3 up and to 6 days	36%	36%	41%
More than 6 days	10%	12%	10%

Types of professional development undertaken

The types of professional development activities undertaken by the sample of 1 101 secondary teachers were: reading professional literature (91%), self-study (87%), courses/workshops (70%), use of software in field of the study or online resources (56%), university study (19%) and courses proposed in the context of a teachers' professional association (*cadre associatif*) during the school holidays (13%).

Teachers were also asked about the content of the last course they had taken. Themes of the courses reported by 10% or more of the 763 teachers who answered the question were: development of the content of the subject area (29%), teaching methods and instructional strategies of subject areas (21%), ICT (21%), integration of ICT in teaching (10%), and evaluation of students (10%). These professional development activities took place during working time (77%), after working time (21%) and during the school holidays (2%).

Impact of professional development

The 763 teachers were also asked about the most important impact of the last course they took. Exchanges about educational practices was mentioned as the most important impact by 37% of the teachers, followed by improvement of classroom practices (17%), enhancement of the pedagogical culture (17%), and better use of ICT (12%). No impact was mentioned by 2% of the respondents and other impacts by 7%.

Barriers to participating in professional development

The 338 teachers who did not participate in continuous professional development training/courses in 2002/03, 2003/04 and 2004/05 mentioned the following reasons for non-participation: not judged useful to undertake professional development (19%), no interesting or suitable professional development (11%), preparation of pupils for exams (11%), no professional development offered (8%), personal reasons (7%), no replacement (6%). Reasons for non-participation that were reported by 5% or less teachers are omitted.

Germany

Policy context

In Germany, professional development is the responsibility of the *Länder* (federal states). In the *Länder*, state-run professional development is organised at the central, regional and local levels. Professional development can also take place in schools or in the form of guided private study. Besides professional development, Germany also uses the concept of further training. Further training usually extends over a longer period and aims to enable teachers to teach another subject or to teach in an additional field, to prepare them for special responsibilities (such as to work as a counsellor teacher), or to acquire qualifications for another teaching career (Eurybase, The Education System in Germany, 2006/07).

In 1999, the Gemischte Kommission Lehrerbildung (Mixed Commission Teacher Training) recom-

mended that great importance should be attached to the professional development of teachers. The significance of professional development and further training for teachers was confirmed in October 2006 in the joint declaration, "Support and Demand – a challenge to education policy, parents, schools, and teachers", of the Standing Conference of the Ministers of Education and Cultural Affairs, the teachers' unions, and other unions in the field of education. The Ministers of Education and Cultural Affairs advocated systematic provision of professional development for teachers in all *Länder*, based on the current reform process and supported by professional school management. In many *Länder* professional development measures which pay particular attention to diagnostic and methodical competence are being implemented and offered to improve professionalism in teaching. In 2004, the Standing Conference adopted standards for teacher training. These standards are also the objectives of lifelong learning in the teaching profession and thus of professional development. Particular importance is attached to further training in the *Länder* in eastern Germany where, owing to the decline in pupil numbers since 2001, far fewer newly qualified teachers are recruited than in the western *Länder*. In eastern Germany, there is a particular need for requalification in certain subjects and teaching careers (Eurybase, The Education System in Germany 2006/07).

Methodology

The report "Education in Germany 2008" (Authoring Group Educational Reporting) presents a comprehensive empirical account of the German education system. It also includes available, reliable data on characteristics of pedagogical staff (e.g. qualifications, age and gender distribution, full-time and part-time teachers, and conditions of employment). It reports an urgent need for information with regard to professional development of staff and the related political and practical challenges. However, it recognises that scientific data are very scarce (see Sheunpflug, Baumert and Kunter, 2006).

Germany did not participate in the first round of the OECD Teaching and Learning International Survey (TALIS). In the autumn of 2008, the German Edu-

cation Union (Gewerkschaft Erziehung und Wissenschaft – GEW) decided to administer an online survey for their members, based on the Austrian TALIS questionnaires (Institut für Sozialwissenschaftliche Studien & Gewerkschaft Erziehung und Wissenschaft, 2009). The target group consisted of teachers and school leaders. In total, 3 734 teachers and 388 school leaders completed the online questionnaire. The German sample consisted of teachers and school leaders who are members of the GEW, as well as of those who are not members (Saldern, 2009). It should be stressed that the GEW survey did not attempt to follow the TALIS methodological standards and that the sample is not representative of all German teachers.

The Austrian TALIS questionnaires were adapted to the German education system and placed on the home page of the GEW in September-December 2008 (Demmer, 2009). The first results were presented at a GEW workshop on 18 June 2009 in Berlin (Institut für Sozialwissenschaftliche Studien & Gewerkschaft Erziehung und Wissenschaft, 2009) and are presented below.

Evidence

Level and intensity of participation in professional development

The results show that almost all German teachers who completed the online questionnaire participated in professional development activities. On average they had approximately 9 days of professional development in the 18 months prior to the survey.

Types of professional development undertaken

The types of professional development activities for which the participation rates reported by German teachers who completed the online survey approximated the average rate of participation in TALIS countries were: courses and workshops, education conferences and seminars, observation visits to other schools, professional development networks, and informal dialogue to improve teaching.

Compared to teachers in the TALIS countries, German teachers who completed the online survey participated more in reading professional literature and observation visits to other schools, and less in individual and collaborative research and qualification programmes.

Perceived impact of professional development

Teachers who completed the online survey viewed the impact of courses and workshops, education conferences and seminars, qualification programmes, observation visits to other schools and reading professional literature on their development as a teacher less positively than the TALIS average. They reported the impact of individual and collaborative research, mentoring and peer observation, and informal dialogue at levels similar to the TALIS average.

Barriers that prevent teachers from participation in professional development

The reasons most commonly cited by German teachers for not taking more professional development were no suitable professional development (67%) and conflict with work schedule (55%) (Table 6.10).

Table 6.10. Reasons for not participating in more professional development (teachers who completed the GEW online survey, 2007-08)

Percentage of teachers mentioning the following barriers for not undertaking (more) professional development

	Reasons for not undertaking more professional development	%
TALIS	Did not have the prerequisites	4
	Too expensive	30
	Lack of employer support	15
	Conflict with work schedule	55
	Family responsibilities	29
	No suitable professional development	67
Other		17

Unsatisfied demand and professional development needs

Of the German teachers who completed the online survey, 58% reported having wanted more professional development than they had received during the survey period. The aspect of teachers' work most frequently rated as an area of high development need was student discipline and behaviour problems.

Greece

Policy context

With regard to professional development of teachers, a distinction can be made between mandatory induction for the newly appointed teachers and (mainly) optional training for those already working in schools (Eurybase, The Education System in Greece, 2007/08).

Professional development is provided by the following organisations:

- the Greek National Ministry of Education and Religious Affairs;
- the Pedagogical Institute (PI);
- the Regional Further Education Centres (PEK);
- Greek universities;
- Technological education institutions (TEI);
- the Hellenic Open University (EAP);
- the Higher School for Teachers of Technological Education (ASPAITE);
- the Organisation for the Further Training of Teachers (OEPEK);
- the Institute of Training (IN.EP) which belongs to the Public Administration School (EKDDA);
- the Institute for Constant Education and Training of Teachers (IDEKE);

- the National Foundation for Youth (EIN);
- the Centre for Educational Research.

School advisors and teachers' unions can also organise training activities. Professional development (seminars, programmes, conferences, etc.) usually takes place on weekends; otherwise the organisations are obliged to get permission from the National Ministry of Education and Religious Affairs.

Teachers receive certificates of attendance. They do not receive formal certificates because there is no assessment of the knowledge or skills they have acquired. The certificates therefore cannot be used for incentives (such as increase in salary) or promotion (e.g. to school principal).

The only teacher training course that provided formal certificates was "Information and Communication Technologies" (2002-07, duration of training: 3 months). The course took place in two stages:

- The first stage, "Training of teachers in using ICTs in education", concerned basic skills. From 2002 to 2007 83 336 teachers of all specialisations were trained and 56 000 teachers were certified in the context of the Information Society Programme and subsidised to buy personal computers. Moreover, 8 000 teachers were trained and 1 000 teachers were certified in the context of the Operational Programme for Education and Initial Vocational Training.
- The second stage, "Training of teachers in using ICTs in teaching procedures", aimed at training 400 teachers as trainers-multipliers. These trainers would then train 15 000 primary and secondary school teachers. This training took place during the school year 2007/08.

ICT teacher training courses will continue during 2009/10 under headings such as "ICT and Foreign Languages: English, French and German".

The optional training programmes last up to a maximum of 80 hours. Some programmes limit

the number of participants. If more teachers apply, participants are selected according to criteria set by the Pedagogical Institute (teachers with less than five years of teaching experience are usually selected). The optional training programmes aim at improving teachers' abilities, skills and knowledge in the areas of didactic approaches, intercultural education, classroom management, and information and communication technologies (computers and Internet).

The Pedagogical Institute also organises compulsory training programmes, which last for ten hours, for new curricula and the introduction of the new schoolbooks in primary, lower and upper secondary education.

Among the professional development activities organised by the Pedagogical Institute was a programme called "Managing Problems in School Class" which was attended by approximately 8 000 teachers of all specialisations in nursery, primary and secondary education in two stages (2005/06 and 2006/07). The issues addressed were:

- managing students' special qualities: dyslexia, learning difficulties, etc. (2005/06, 20 hours and 2006/07, 28 hours);
- behaviour problems (2005/06, 22 hours and 2006/07, 36 hours);
- managing multiculturalism in school class (2005/06, 8 hours and 2006/07, 16 hours).

During 2007/08, the Organisation for the Further Training of Teachers (OEPEK), in the framework of the Community Support Framework and the Operational Programme for Education and Initial Vocational Training, implemented two training activities: *i*) intensive teacher training in the field of family, social, cultural context and student performance to train 5 000 teachers; and *ii*) intensive teacher training on contemporary teaching approaches and methods for the development of critical and creative thinking, in which 6 000 teachers of all specialisations participated.

IN.EP (the Institute of Training), which is part of to EKDDA (the Public Administration School), carried out optional training programmes for teachers on environmental education and in 2007/08 organised seminars on issues such as culture and education, contemporary means of transmitting information and its impact on students' lives, and intercultural issues and education. The training programme on legal actions on school management was attended by 800 teachers with administrative positions.

Moreover, in response to a requirement of the National Ministry of Education and Religious Affairs, IN.EP implemented 40 educational programmes (70 hours, 2006-08) on organising school libraries with the use of contemporary ICT tools, which were attended by 700 teachers, and 5 days of seminars on museums and education in Athens and in cities throughout Greece.

Methodology

At the end of each training project, an internal and external evaluation of the project takes place. The data below are cited from the evaluation of the training programme on managing problems in school class organised by the Pedagogical Institute, and concerns a sample of 4 000 primary and secondary teachers who attended the training and completed the questionnaire. The reference period is 2005-07.

Evidence

Barriers to participation in professional development

Lack of time to attend (57%), insufficient information (39%), the limited number of teachers accepted (36%), and the costs of training (36%) were the most often reported barriers to undertaking (more) professional development among the 4 000 primary and secondary teachers in the sample during the period 2005-07.

Other reported reasons were difficulties with school/service (11%) and other reasons (3%); 21% of the teachers in the sample mentioned that they did not face any barriers.

Impact of the training programmes

Almost half of the primary and secondary teachers in the sample (48%) reported that the professional development activities had a great impact; another 36% assessed the impact as sufficient, while 9% reported that the professional development activities had little impact and 5% that the activities had no impact at all.

Professional development needs

The aspects of teachers' work reported as areas with professional development needs by more than half of the of 4 000 primary and secondary teachers in the sample concern school and classroom management (including teaching in multicultural setting and teaching classes with mixed abilities), instructional practices, and ICT teaching skills (Table 6.11).

Table 6.11. Professional developments needs of teachers who attended the training programme “Managing Problems in School Class”, 2005-07

Percentage of teachers in the sample indicating priorities for professional development in each of the following areas

Priorities for professional development and training		Teachers (primary and secondary education) N=4 000
Areas of teachers' high professional development needs in TALIS survey	Areas of teachers' professional development needs used in the evaluation questionnaire of the programme “Managing Problems in School Class”	%
School and classroom management	Classroom management, school management and administration, student discipline and behaviour problems, conflict management, teaching in a multicultural setting, teaching mixed-ability classes, etc.	77.0
Instructional practices	Pedagogical and methodological approaches: teaching methodology, experiential learning, group work, projects, etc.	60.0
ICT teaching skills	Using information and communication technology (ICT) in teaching	53.0
Content and performance standards	Curricula, lesson planning, organisation of activities	43.0
Subject field	Strengthening and/or updating skills and knowledge in subject areas	35.0
Assessment	Student assessment practices, evaluation of pedagogical activities (i.e. teachers' practices, materials, books, curriculum), school evaluation	23.0

Liechtenstein

Policy context

Teachers are obliged to undertake regular further training to reinforce their professional skills. The Office of Education offers professional development events on educational topics in a programme of publicly advertised courses. The education inspector can make specific further training courses mandatory for certain categories of teachers. Attendance at further training events is free of charge. A contribution may be levied to cover the cost of materials (Eurybase, The Education System in Liechtenstein, 2007/08).

The course programme is based on a broad consensus on the needs of teaching staff, schools inspectors

and pedagogical commissions. It also reflects current reform efforts and educational development projects. The inspectorates are responsible for approving in-service training applications from teachers, work groups or teaching teams and for monitoring whether teachers attend the number of further training days stipulated annually by the inspector. Every teacher keeps a record booklet confirming the training activities he/she has attended (Eurybase, The Education System in Liechtenstein, 2007/08).

The education inspector determines the course programmes for the various professional development objectives, the mandatory number of training course days and the mandatory courses. Courses are normally for six days a year, which the teacher must attend at his/her discretion or on the

recommendation of the inspector (Eurybase, The Education System in Liechtenstein, 2007/08).

In the case of permanent teachers who have been employed in public schools for at least ten years, of which the last five have been uninterrupted, and who are not more than 55 years old, the government may approve a request for intensive further training. The purpose of such training is to promote personal and professional development, especially in the candidate's own subjects and in the field of pedagogy and didactics. The cost of arranging a substitute (supply teacher) will be paid on the basis of 5 to 20 teaching weeks depending on the average full-time-equivalent percentage of the last seven years. (Eurybase, The Education System in Liechtenstein, 2007/08).

The Netherlands

Policy context

In the Netherlands school boards are responsible for their personnel policies, including the professional development of teachers. The funds come from the personnel budget, which school boards spend at their discretion (Eurybase, The Education System in the Netherlands, 2007/08).

However, with the implementation of the Education Professions Act (WBIO), which entered into force on 1 August 2006 and regulates standards of competence for both teachers and people working in education-related jobs, every school board is obliged to take measures and introduce instruments to ensure that the staff to whom the standards apply can maintain their skills (Eurybase, The Education System in the Netherlands, 2007/08).

By 2008, schools are also required to have drafted a support programme for new education personnel and to agree with training institutions on the distribution of tasks and responsibilities when education personnel receive part of their training on the job and when students from teacher training institutions do their teaching practice (Eurybase, The Education System in the Netherlands, 2007/08).

To enhance the quality and position of teachers as well as the attractiveness of the profession and to tackle teacher shortages, the Dutch government drafted a package of measures (the "Teachers Matter" action plan), which focuses on three specific themes: a stronger profession, a more professional school and better rewards. The action plan cannot be fully implemented within a single government's term of office. Both the measures and their funding are therefore subject to long-term planning and results-based agreements between the government, employers' organisations and trade unions (Eurybase, The Education System in the Netherlands, 2007/08).

To implement some of these plans, on 1 July 2008, the government signed an agreement, "Teacher of the Netherlands" (Leerkracht van Nederland) with employers' organisations and trade unions. As a first measure, in spring 2008, the teacher development grant was introduced. With this grant teachers can receive an individual contribution towards the costs of raising their professional level, deepening their specialist knowledge or specialising. Teachers can apply for a grant only once in their career. The grant can be used to cover:

- fees up to a maximum of EUR 3 500 a year, for up to three years;
- the costs of study material and travel;
- the cost to the employer of arranging a substitute (supply teacher) during study leave, for a maximum of 20 days a year.

To qualify for a grant, applicants must:

- be qualified primary, secondary or vocational education teachers, or, for teachers in higher professional education, have at least a bachelor's degree;
- have been working at a school funded by the Ministry of Education, Culture and Science for at least one year;
- spend at least 20% of their working hours on teaching duties (Eurybase, The Education System in the Netherlands, 2007/08).

Methodology

The Netherlands participated in TALIS but was unable to meet the sampling requirements agreed by the TALIS Board of participating countries. To be included in the international report *Creating Effective Teaching and Learning Environments: First Results from TALIS* (OECD, 2009), 75% of the 150 sampled Dutch schools would have had to participate with a minimum response rate of 50% of 20 randomly selected teachers in each school. In the Netherlands, the response rate of 50% of selected teachers was met in 42 schools, and 28 other schools returned the questionnaires but did not meet the required response rate. In total in the Netherlands, 657 teachers and 55 principals returned the questionnaire (Van Cooten and Van Bergen, 2009).

Based on the responses of the 657 teachers who returned the teacher questionnaire, Van Cooten and Van Bergen (in preparation) prepared a draft national report for the Dutch Ministry of Education, Science and Culture. The data presented in their report underlie the results presented below.

IVA policy research and advice (IVA Beleidsonderzoek en advies) analysed the data of the teachers who applied for the teacher development grant in the first year. In the period June 2008–June 2009 teachers could apply for the teacher development grant during three periods. The data are from the Information Management Group, the organisation to which teachers apply for a grant. The data for the third period are provisional (Ministry of Education, Culture and Science, 2009).

Evidence

Participation in professional development and types of professional development activities undertaken (based on the responses of 657 teachers who completed TALIS teacher questionnaire)

Just over nine-tenths of teachers (91.4%) who completed the TALIS questionnaire participated in some professional development over the survey period (defined as having taken part in at least one day of development in the previous 18 months). On average, Dutch teachers who returned the question-

naire had 13.5 days of professional development in the 18 months prior to the survey.

The types of professional development most frequently reported by Dutch teachers who completed the TALIS questionnaire were: informal dialogue to improve teaching (94.1%), courses and workshops (86.7%), and reading professional literature (84.4%) (Table 6.12). Participation among the Dutch teachers who completed the questionnaire was lowest on observation visits to other schools (24.8%) and participation in professional development networks (25.8%) (Van Cooten and Van Bergen, 2009).

Table 6.12. Types of professional development undertaken by lower secondary teachers who completed the TALIS survey, 2007-08

Percentage of teachers undertaking specified professional development activities in the previous 18 months

Types of professional development activities	%
Courses and workshops	86.7%
Education conferences and seminars	50.8%
Qualification programmes	30.4%
Observation visits to other schools	24.8%
Professional development network	25.8%
Individual and collaborative research	44.0%
Mentoring and peer observation	40.0%
Reading professional literature	84.4%
Informal dialogue to improve teaching	94.1%

Participation in professional development and types of professional development activities undertaken (teacher development grant)

Under the teacher development grant teachers can receive an individual contribution towards the costs of raising their professional level, deepening their specialist knowledge or specialising. The majority of programmes which secondary teachers have followed so far under the grant are qualification programmes as defined in TALIS.

From June 2008 to June 2009 17 000 teachers applied for a teacher development grant and

13 500 grants were awarded. More than 50% of the grants were allocated to primary school teachers and 29% to secondary school teachers. Of the 3 920 secondary school teachers who received a grant, 1 340 received the grant in the first period, 1 090 in the second and 1 490 in the third (IVA policy research and advice, forthcoming).

Almost 60% of the teachers who received a grant in the first period followed a programme with a duration of more than two years (Table 6.13).

Concerning the types of programmes, nearly two-thirds of the secondary school teachers who received a grant in the first period followed a teacher training programme at the bachelor's (HBO-based teacher training) or master's level (university-based teacher training) or at an unknown level (Table 6.14).

Table 6.15 further subdivides participation rates by specialist areas. The three areas are: guidance/coaching and remedial teaching, behaviour (problems), and special education needs.

Table 6.13. Duration of programmes followed by teachers awarded the teacher development grant in spring 2008 (secondary education)

Percentage of teachers awarded a grant, broken down by duration of the programme

	Duration of programme					Total number of teachers
	Less than 3 months	Between 3 and 6 months	Between 6 months and 1 year	1-2 years	More than 2 years	
Secondary education	0.7%	1.7%	13.4%	25.4%	58.8%	1 340

Table 6.14. Types of programmes followed by teachers (secondary education) awarded the teacher development grant in spring 2008

Percentage of secondary teachers awarded a grant, broken down by type of programme¹

Type of programmes followed	Percentage (N= 1 340)
HBO-based teacher training	38.1%
University-based teacher training	14.9%
Teacher training, level unknown	10.2%
Management	4.6%
Specialist area	21.3%
Generic master (no teacher training)	4.0%
Generic bachelor (no teacher training)	0.8%
Generic, level unknown	3.8%
Other/ unknown	2.2%

1. The attribution of programmes that teachers follow into the different types of programmes listed in Table 6.14 is not always unambiguous: for example, the training programme "management in care" could be subject- or specialisation-oriented (care) or management.

Table 6.15. Participation rates of teachers awarded a grant in spring 2008 in courses and programmes in specialisation area, broken down by areas

Type of programmes followed	Percentage (N= 287)
Guidance/coaching and remedial teaching	20.2%
Behaviour(all problems)	21.6%
Special education needs (general)	25.8%
Special education needs (specialisation)	12.5%
Language and mathematics	1.7%
Other	18.1%

Impact of professional development

Table 6.16 shows the percentage of Dutch teachers who completed the questionnaire and who reported a high or moderate impact for the types of professional development they had undertaken during the survey period.

Table 6.16. Impact of different types of professional development undertaken by lower secondary teachers who completed the TALIS questionnaire, 2007-08

Percentage of teachers of lower secondary education reporting that the professional development undertaken in the 18 months had a moderate or high impact upon their development as a teacher

Type of professional development	Percentage (N= 657)
Courses and workshops	74.5%
Education conferences and seminars	62.5%
Qualification programmes	94.3%
Observation visits to other schools	76.0%
Professional development network	79.2%
Individual and collaborative research	91.8%
Mentoring and peer observation	84.3%
Reading professional literature	80.3%
Informal dialogue to improve teaching	89.8%

The teachers who completed the questionnaire reported that the most effective types of professional development were qualification programmes and individual and collaborative research activities. They rated education conferences and seminars as the least effective type of professional development (Van Cooten and Van Bergen, 2009).

Professional development needs

Almost half of the teachers (47.8%) who completed the TALIS questionnaire reported having wanted more professional development than

they had received in the survey period. Almost one-third (30.4%) rated student counselling as the area with the highest development need. In addition, they reported a high level of need for professional development in the areas of ICT teaching skills (27.0%), teaching special learning needs students (26.0%), subject field (25.3%), instructional practices (24.0%) and content and performance standards (22.2%) (Table 6.17). The aspects of teachers' work least frequently reported as having high development needs were school management and administration and teaching in a multicultural setting (Van Cooten and Van Bergen, 2009).

Table 6.17. High professional development needs of lower secondary teachers who completed the TALIS survey, 2007-08

Percentage of teachers indicating a high level of need

Area	%
Content and performance standards	22.2%
Student assessment practices	15.7%
Classroom management	16.6%
Subject field	25.3%
Instructional practices	24.0%
ICT teaching skills	27.0%
Teaching special learning needs students	26.0%
Student discipline and behaviour problems	20.6%
School management and administration	6.0%
Teaching in a multicultural setting	5.4%
Student counselling	30.4%

Support received by teachers for professional development

Of the Dutch teachers who completed the TALIS questionnaire and engaged in some professional development, the professional development was free for 77.9%. Almost 7% reported that they had to pay all the cost and a further 15.5% paid some of the cost.

Two-thirds of the teachers (67%) received scheduled time to take part in development activities. Only 3.7% of teachers reporting having received a salary supplement (Van Cooten and Van Bergen, 2009).

Barriers that prevent teachers from participating in professional development

Among teachers who completed the TALIS survey the most frequently cited barrier for not taking more professional development was conflict with work schedule, mentioned by just over half of all teachers. Other barriers frequently reported were family responsibilities, no suitable professional development and lack of employer support (Table 6.18). These barriers were reported by 35.3%, 30.3% and 29.7%, respectively, of these teachers (Van Cooten and Van Bergen, 2009).

Table 6.18. Reasons for not participating in more professional development (lower secondary teachers who completed the TALIS survey), 2007-08

Percentage of teachers mentioning the following barriers to undertaking (more) professional development

Reasons for not undertaking more professional development	%
Did not have the prerequisites	9.0
Too expensive	24.3
Lack of employer support	29.7
Conflict with work schedule	50.3
Family responsibilities	35.3
No suitable professional development	30.3

Sweden

Policy context

In Sweden compulsory schools (*grundskolor*) are run either by municipalities or independently as what are called grant-aided independent schools. Under the Education Act, the organiser of education is obliged to ensure that professional development is available for teaching staff (Eurybase, The Education System in Sweden, 2007/08). The state, by means of funds made available to the Swedish National Agency for Education, steers activities towards nationally important areas, taking into account that the principal of the school has the responsibility for implementing professional

development (Eurybase, The Education System in Sweden, 2007/08).

Under the “Boost for teachers” initiative, 30 000 primary, lower secondary and upper secondary teachers (nearly a quarter of all Swedish teachers) are currently to be offered advanced professional development at higher education institutions. The government has set aside SEK 2.9 billion for 2007-10 to allow teachers to receive 80% of their current pay when studying. For lower secondary school teachers the study load is 20-45 ECTS.³ At the same time, the government is putting SEK 1 billion into supplementary education for teachers who are not fully qualified, continuing professional education for teachers of Swedish for immigrants (SFI), and training for school heads (www.regeringen.se/sb/d/9400).

The main goal of the “Boost for teachers” initiative is to improve the results of Swedish schools. Both Swedish and international studies show that students’ results have deteriorated in a number of subject matter areas. The aim is to strengthen teachers’ knowledge and skills with a view to helping students’ better achieve the educational objectives.

The Swedish National Agency for Education has been commissioned by the government to solicit from universities and university colleges courses especially designed for participating teachers. Under the initiative teachers can also participate in regular courses offered by the universities and university colleges. In both cases, the employer (municipality or independent school) must approve the participation. The study load comprises 20-45 ECTS (560-1 260 hours) for lower secondary school teachers and 10-30 ECTS (280-840 hours) for primary teachers.

³ European Credit Transfer and Accumulation System (ECTS) is a standard for comparing the study attainment and performance of students of higher education across the European Union and other collaborating European countries. For successfully completed studies, ECTS credits are awarded. One academic year corresponds to 60 ECTS credits. These are equivalent to 1 500-1 800 hours of study in all countries irrespective of standard or qualification type and are used to facilitate transfer and progression throughout the Union (one credit corresponds to 25-30 hours of study).

Methodology

Data on participation are collected by the Swedish National Agency for Education (SNAE) and refer to teachers who participated in courses organised by the Swedish National Agency for Education under the “Boost for teachers” initiative. Data on impact are available from a survey

of 519 teachers who participated in SNAE courses in spring 2008.

For autumn 2008 and spring and autumn 2009 the Swedish National Agency for Education collected data on the course places offered, specified by topic, as well as on the number of applicants for courses organised by SNAE for each topic.

Table 6.19. Number of courses places offered, applicants and ratio of applicants to course places for courses organised by the Swedish National Agency for Education, autumn 2008, spring 2009, autumn 2009, all teachers

	Autumn 2008			Spring 2009			Autumn 2009		
	Number of places	Number of applicants	Ratio	Number of places	Number of applicants	Ratio	Number of places	Number of applicants	Ratio
Special needs education	637	997	157%	771	627	81%	841	778	93%
Mathematics	739	598	81%	823	497	60%	597	589	99%
Development of reading, writing and language skills	570	500	88%	557	206	37%	514	274	53%
Swedish and Swedish as a foreign language	694	452	65%	446	198	44%	643	518	81%
Languages including English	554	279	50%	405	180	44%	356	302	85%
Music, arts and crafts	449	189	42%	267	83	31%	232	106	46%
Technology	493	119	24%	438	74	17%	273	106	39%
Physical education and health	252	118	47%	121	47	39%	195	78	40%
Natural science subjects	432	112	26%	309	104	34%	249	224	90%
Social subjects	314	108	34%	385	77	20%	212	145	68%
Vocational subjects	185	39	21%	182	41	23%	77	36	47%
Swedish for immigrants	66	37	56%	101	53	52%	65	20	31%
Total	5 385	3 548	65%	4 805	2 187	46%	4 254	3 176	75%

Evidence

Level and intensity of participation in professional development activities

In autumn 2007, 772 teachers (of whom 497 compulsory school teachers) participated in professional development courses related to the “Boost for teach-

ers” initiative and in 2008, 5 695 teachers (of whom 3 858 compulsory school teachers) took part (Swedish National Agency for Education, unpublished data). In 2008, 47.2% of all these teachers (51.2% of compulsory school teachers) participated in courses organised by the Swedish National Agency for Education. More than half of the teachers (52.2%) participated in courses offered by universities and university colleges.

Professional development needs

For autumn 2008 and spring and autumn 2009 the number of places offered for courses organised by the Swedish National Agency for Education and the number of applicants for each area is presented in Table 6.19. The ratio of applicants to places is indicated between brackets. Although the numbers and ratios presented in the table do not always equal the actual number of participants, they give an overall picture of places offered and applicants. Both in 2008 and 2009 the full number of places offered were not utilised. In total there were applicants for 65% of the places offered in autumn 2008, and for 46% of the available places in spring 2009 and 75% in autumn 2009.

The ratio of applicants to the number of places offered is highest in the areas of special needs education, mathematics, and Swedish and Swedish as a foreign language; it is lowest in the areas of technology and vocational subjects. This shows that course offerings in the former subjects are in greater demand than those offered in the latter subjects.

Impact of professional development

Some impact data are available for the 2007 and 2008 group. In a survey of 519 participants in courses related to the "Boost for teachers" initiative, 68.8% reported that the course gave them additional subject knowledge to a high or very high extent. Almost the same percentage (66.7%) reported that the course gave them additional teaching skills to a high or very high extent.

Switzerland

In Switzerland, the main responsibility for education lies with the 26 cantons. National requirements only apply to key parameters such as school entry age and length of compulsory schooling (Eurybase, The Education System in Switzerland, 2007).

Professional development of teachers is seen as important for the further development of schools and teachers, as well as for the realisation of educational, upbringing and school targets and measures. Rights and duties with regard to teachers' professional development are laid down in cantonal education laws and regulations.

Although almost all cantonal legislation declares that a teacher has to participate in professional development, only a few cantons set the required number of hours. For example, the educational regulations of the canton of Basel Land state that teachers should spend at least 2% of their time for professional development (Swiss Conference of Cantonal Ministers of Education, 2007), and according to the regulations of the canton of Berne teachers can use around 3% of their annual working time for professional development. In the canton of Berne school management can oblige teachers to take part in professional development (Regulations for the appointment of teachers, 2007).

The education departments of the cantons have the right to prescribe obligatory professional development activities. Participation in professional development programmes can result in a salary increase when the professional development leads to a new position (status). The costs of teachers' professional development are mainly covered by the cantons and the municipalities. Teachers may be charged for the costs of freely chosen professional development courses. In addition, schools can organise professional development themselves (Eurybase, The Education System in Switzerland 2007).

The 13 universities of teacher education in Switzerland provide a wide range of professional development courses and programmes which can be rounded off with a recognised Master of Advanced Studies (MAS) diploma, a diploma of Advanced Studies (DAS), a certificate of Advanced Studies (CAS) or with acknowledgement of participation. Other higher vocational education institutions as well other organisations also offer professional development activities (Eurybase, The Education System in Switzerland 2007).

At the national level, the Swiss Conference of Cantonal Ministers of Education can define nationwide titles for specific additional qualifications. Until now such additional qualifications have been defined for teachers in the field of ICT and for teachers who prepare students for their vocation. A third definition is in preparation for teachers with school-management functions. With these definitions the Conference can emphasise the need for specific professional development and can make it attractive for teachers to take part in such qualification programmes (Swiss Conference of Cantonal Ministers of Education, 2008).

Furthermore there is a broad consensus regarding the need for and benefit of professional development, both generally and specifically in the field of education. Both professional ethics and official policies stress the need for the individual's engagement in and the institutional support for professional development (LCH, 2008).

Methodology and evidence

The results of a study by the Swiss teachers' union into working time of teachers from the nine German-speaking cantons in Switzerland show that teachers in these cantons spend on average 4% of their working time on professional development. In this study 1 886 teachers at different educational levels (primary, lower secondary and upper secondary) participated. The definition of professional development includes both self-organised (informal) professional development and school-based professional development as well as formal professional development offered by private and public organisations (Landert, 2006).

United Kingdom (England)

Policy context

In England, there is no legal minimum requirement for the number of hours to be spent on continuing professional development. The statutory conditions of service do, however, require teachers to be available for work for 195 days a year, of which 190 are teaching days. The other five days are to be devoted to a number of non-teaching activities, including continuing professional development (Eurybase, The Education System in England, Wales, and Northern Ireland, 2007/08).

Responsibility and funding for professional development are devolved to schools. Each school determines its own continuing professional development (CPD) needs, depending on the requirements of the school development plan and, where appropriate, the broad framework provided by the government's specific grant provisions.

The current agenda for continuing professional development in England stems from the "Five Year Strategy for Children and Learners" published in 2004 (DfES, 2004), which sets out a range of measures, including:

- building stronger demand from teachers and schools for high quality development;
- embedding the practice of having teachers offer coaching and mentoring to other teachers;
- introducing an "Excellent Teachers" scheme to reward high performance and commitment to professional development;
- encouraging more advanced skills teachers (ASTs) to play a lead role in spreading expertise across schools and establishing a new culture of professional development (Eurybase, The Education System in England, Wales, and Northern Ireland, 2007/08).

Methodology

Since 2004, the General Teaching Council for England (GTC) has commissioned an annual survey of a sample of 10 000 primary and secondary teachers from the GTC Registration database. The surveys form part of the evidence base used to inform GTC policy and advice to the Secretary of State for Children, Schools and Families. Questions about teachers' continuing professional development (CPD) have appeared in all four surveys.

The most recent data are from the 2007 Survey (General Teaching Council for England, 2008). In 2007 the response rate was quite low (25%) which implies that the teachers who responded might not be representative of all teachers (www.gtce.org.uk/research/teacher_survey/).

In 2006, the response rate was 37%, in 2005 42% and in 2004 44% (Hutchings *et al.*, 2006a; Sturman *et al.*, 2005; Sturman, Taggart and Woodthorpe, 2004).

In the 2007 GTC survey two questions concerned professional development: *i)* In the last 12 months, do you feel that your professional development needs were met? and *ii)* If you answered no to the previous question, please explain ... why you feel this way.

In the 2004, 2005 and 2006 survey, questions were also asked about the type of professional development activities that teachers participated in during the previous 12 months and professional development

needs that teachers felt they needed in the subsequent 12 months.

Evidence

Types of professional development undertaken

Table 6.20 shows the percentage of teachers reporting the type of professional development activity that they had participated in frequently or occasionally in 2004, 2005 and 2006 during the previous 12 months.

The professional development activities that teachers participated in most frequently were courses on school professional development (INSET) days (89.6%, 2006 only), being observed by colleagues (82.7%, 2006 only), collaborative learning with colleagues in my school (on average around 83.5% in 2004, 2005 and 2006), taking an active part in school self-evaluation (on average around 80% in 2004, 2005 and 2006), participating in external courses (on average around 79% in 2004, 2005 and 2006), and development/learning individually (78.4%, 2006 only) (Hutchings *et al.*, 2006a and b).

Table 6.20. Types of professional development undertaken by teachers, 2004, 2005 and 2006

Percentages of primary and secondary teachers undertaking specified types of professional development frequently or occasionally in the previous 12 months

Type of activity	2004	2005	2006
	Frequently or occasionally	Frequently or occasionally	Frequently or occasionally
Being a mentor or coach	m	59.3%	57.4%
Being supported by a mentor or coach	31.0%	28.5%	37.9%
Collaborative learning with colleagues in my school	85.4%	83.5%	81.5%
Collaborative learning within a network of schools	52.1%	56.5%	60.0%
Taking active part in school self-evaluation	78.8%	79.9%	83.0%
Participating in collaborative inquiry	49.7%	59.4%	50.9%
Engaging with subject or specialist associations	60.4%	66.1%	61.1%
Participating in external courses	78.3%	80.9%	78.2%
Taking a secondment or sabbatical	1.9%	2.2%	1.8%
Undertaking classroom or school-based research ¹	11.3%	13.9%	26.8%
Training with professionals from other sectors (e.g. in relation to Every Child Matters)	m	m	40.7%
Observing colleagues teach	m	m	70.0%
Being observed by colleagues	m	m	82.7%
Development/learning individually (e.g. by reading)	m	m	78.4%
Courses in school held on professional development (INSET) days	m	m	89.6%

m = data is not available

¹ In 2004 and 2005 the question was: I have participated in action research.

Table 6.21. Percentage of primary and secondary teachers who felt that their professional development needs had been met in the last 12 months

	2004	2005	2006	2007 ¹
Fully	19.7%	21.8%	24.4%	30%
To some extent	57.1%	57.7%	57.0%	53%
Not	23.3%	20.5%	18.6%	16%

¹ In 2007, 1% was missing.

Unsatisfied demand and reasons for not participating in more professional development

In 2007, almost one-third (30%) of teachers felt that their professional development needs over the previous 12 months had been fully met; just over half (53%) felt that they had been met to some extent; and 17% felt that their needs had not been met (Table 6.21).

The percentage of teachers who felt that their needs were fully met has increased since 2004 from 20% to 30%. Meanwhile, there has been a corresponding decline from 23% to 16% in the percentage of teachers who felt that their needs had not been met.

The most common reasons why teachers felt that their professional development needs had not been met were lack of funding to attend training (19%), a shortage of time to attend (11%), not offered the opportunity to attend sessions (10%), and supply (substitute) teachers do not get the opportunity to attend sessions (10%) (General Teaching Council for England, 2008).

Professional development needs

Table 6.22 shows the percentages of teachers who indicated in 2005 and 2006 that they would need professional development in selected areas over the subsequent 12 months. Both in 2005 and 2006 using ICT in teaching (reported by 57.3% and 58.7% of teachers, respectively) and strengthening and/or updating skills and knowledge in curriculum subject areas (51.7% and 49.7%, respectively) are the areas of greatest development need, followed by addressing underachievement in groups of pupils (48.0% and 46.3%, respectively) and assessment for learning (42.6%, 2006 only).

Some changes in the perception of needs are seen in the 2006 responses. In particular, personalised learning was selected by 54% of teachers in 2005, but only by 37% in 2006. Other differences from the 2005 responses were the increased proportion of respondents who opted for teaching pupils with special educational needs (2005, 39%; 2006, 46%), teaching gifted and talented pupils (40%, 45%), and target setting for individual pupils (31%, 38%).

Table 6.22. Percentage of teachers indicating they would need professional development in each of the following areas over the subsequent 12 months, 2005, 2006

I will need professional development in	2005 (N=4 110)	2006 (N= 3 597)
Teaching and learning		
Personalised learning	54.0%	36.6%
Teaching pupils with English as an additional language	14.1%	18.0%
Meeting the needs of ethnic minority students	16.6%	15.9%
Teaching pupils with special education needs	39.0%	46.2%
Teaching gifted and talented pupils	40.3%	45.4%
Target setting for individual pupils	31.3%	38.2%
Teaching citizenship	26.1%	24.2%
Strengthening and/or updating skills and knowledge in curriculum subject areas	49.7%	51.7%
Using information and communication technology (ICT) in teaching	57.3%	58.7%
Addressing underachievement in groups of pupils	48.0%	46.3%
Pupils' development and behaviour		
Promoting social and emotional development in pupils	30.5%	36.8%
Behaviour management	35.2%	36.1%
Leadership, management and team working		
Working with and/or managing support staff	28.4%	31.2%
School self-evaluation	29.8%	29.3%
New items in 2006 questionnaire		2006(N=3 665)
Supporting pupils' literacy	m	30.1%
Supporting pupils' numeracy	m	25.8%
Assessment for learning	m	42.6%
Working with other professionals in school	m	26.1%

m = data is not available

United Kingdom (Scotland)

Policy context

In Scotland, in accordance with the national agreement, *A Teaching Profession for the 21st Century* (2001), all teachers are entitled to a contractual minimum of 35 hours of professional development (PD) a year. Every year, each teacher draws up a professional development plan for the forthcoming year after discussion with his/her line manager in a formal process of professional review and development. This plan should be based on individual professional need and on school, local and national priorities. Teachers are expected to maintain a portfolio of their professional development.

The 35 hours are additional to the 5 days each year that teachers spend in school without pupils. These “closure days” are usually devoted to professional development activities organised or agreed by the head teacher or the local authority (Eurybase, The Education System in Scotland, 2007/08).

In Scotland career opportunities within schools reflect the career structure introduced in 2002. The guidance document, “Professional Review and Development” (2002), provides the framework relevant to different stages of teachers’ careers. It is based on the three standards:

- Standard for Full Registration (normally achieved at the end of the probationary year in teaching, section on Induction and Mentoring);
- Standard for Chartered Teacher (intended for teachers who prefer to remain in the classroom, to encourage them to focus on enhancement of teaching and learning);
- Standard for Headship (from 1 August 2005 teachers appointed to their first head teacher post have to demonstrate that they meet this standard).

Methodology and evidence

Data on the professional development of teachers in Scotland are scarce. In *Teachers in Scotland*

2008 (Scottish Government, 24 March 2009) data are published on the teachers undertaking programmes for career standards. In 2008, 803 Scottish teachers undertook the chartered teacher programme, seven the standard for headship programme, and six the achieved standard for headship programme.

China

Policy context

In the last decade the Chinese government and primary and secondary schools have paid considerable attention to improving teachers’ continuing education. The central government views professional development as routine work and regulates it in an institutional context (Li, Zhu, Zhao and Song, 2009a). In 1999, the Chinese Ministry of Education published the Continuing Education for Secondary and Primary School Teachers Professional Development Regulation. According to this regulation, all primary and secondary school teachers should follow a minimum of 240 credit hours of professional development over a five-year period in order to get the required credit hours (Ministry of Education, 1999). Meanwhile, primary and secondary schools encourage teachers to improve their teaching and research quality in various ways, e.g. by means of collective lesson planning, observing and assessing lessons together in teaching research groups⁴ of teachers who teach the same subject in one school, the mentor-novice model (in which an experienced teacher as a mentor assists a novice teacher), didactic reflection, etc.

Also, since China started to implement basic education curriculum reform in 2001, new curriculum, new concepts and new technologies are seen as important areas for professional development. Each level of government organises training in the new curriculum for all teachers, including backbone

4 Teaching research groups (TRGs) are organisations existing at the different levels of China’s education system (e.g. school, district, municipal and provincial level). The lowest level TRG is in each school. It supports the education administration in managing, organising and implementing teaching and teacher learning activities.

teachers,⁵ on the basic concepts and technology of the reform and also on discussion and research on problems encountered in practice. At the school level, sharing teaching ideas and experience with excellent teachers is becoming an important training model.

Promoting more teachers to backbone teachers is an important goal of professional development. The Chinese Educational Ministry has established various projects to this end, such as the Trans-century Gardener Engineering Project and the Action plan for the revitalisation of education in the 21st Century (The Central Committee of the Communist Party of China and the State Council, 1999).

The Chinese government also encourages teachers to improve their academic background through professional development. In 2010, teachers in lower-secondary schools should be able to gain a bachelor's degree, and a certain proportion of high school teachers and headmasters in some developed regions are to possess a master's degree (The Central Committee of the Communist Party of China and the State Council, 1999).

Finally, a special regulation indicates that starting teachers should at least follow a 120-hour intensive training during probation (China, Ministry of Education, 1999). The mentor-novice model is widely adopted by schools as a way to improve teachers' skills with regard to ideology education⁶ and practical pedagogy.

5 "Backbone" teachers are recognised as excellent teachers and function at different levels of the education system. There are standards for selecting backbone teachers, such as professional ethics, diplomas, professional title, teaching years, professional competency in instruction and research. For the diploma, elementary teachers who hold a diploma from three-year teachers colleges and secondary teachers who hold bachelor degrees are considered qualified for selection as backbone teachers. To further improve the quality of backbone teachers and make them models for other teachers, different levels of government and schools design specific training programmes for them (called backbone teachers training).

6 Ideology education involves obtaining correct attitudes and moral standards. It is meant to teach loyalty to the party and country.

Methodology

In 2007, a study was undertaken by the Centre of Teacher Education Research of Beijing Normal University to investigate the amount, type, satisfaction and perceived needs of teachers' professional development and the barriers to participation in continuous professional development in Beijing. In the study 5 255 secondary and primary school teachers in four urban areas and four rural areas⁷ were randomly selected. At the lower secondary level, 2 017 teachers took part, of whom 1 232 (61.1%) from urban areas and 785 (38.9%) from rural areas. The data refer to the 2004-07 calendar years

Evidence

Types of professional development activities undertaken

Table 6.23 shows the types of continuous professional development activities undertaken by lower secondary teachers in Beijing in 2004-07. The activities in which teachers were most involved were teaching research group activities (86.1%), credit hours in continuous education (CHCE) (83.2%), and new curriculum reform training (NCR) (69.7%). Participation rates in advanced degree-related training such master's degree courses, educational master's degree courses, bachelor's degree and master's certificate classes) were quite low.

Further analysis of the data showed that lower secondary school teachers from the urban areas of Beijing participated more in educational master's degree courses, master's degree courses and master's certificate classes than teachers from rural areas. Teachers from urban areas also attended more teaching research group activities and backbone teacher training. There is no significant difference between the two groups of teachers with regard to the other professional development activities.

7 Beijing consists of eight urban and ten rural areas. In total, there are 99 000 primary and secondary school professional teachers (Beijing Education Committee, 2008).

Table 6.23. Types of professional development undertaken by lower secondary teachers since 2004

Number and percentages of lower secondary teachers undertaking specified types of professional development in Beijing, 2004-07

Types of PD activities	Number of participants (N=1 949)	Percentage
Bachelor's degree (BD)	99	5.1%
Educational master's degree(EMD)	55	2.8%
Master's degree(MD)	54	2.8%
Master's certificate class (MCC)	390	20.0%
New Curriculum Reform training (NCR)	1,358	69.7%
Teaching Research Group activities (TRG)	1,678	86.1%
Credit hours in continuing education (CHCE)	1,620	83.2%
Backbone teacher training (BT)	423	21.7%

Professional development needs

Table 6.24 shows the percentages of lower secondary teachers who indicated their need for professional development in selected areas. The largest category was learning from model teachers and pedagogy.

Professional development needs vary among teachers at different stages of their career. Teachers with one to three years of teaching need classroom management strategies and learning from model teachers the most, while teachers with four to ten years of teaching tend to need learning from model teachers activities and pedagogy. Teachers with more than ten years of teaching are in need of learning new concepts and theories of teaching and learning and of subject-matter knowledge.

Professional development needs also vary among teachers from urban and rural areas, especially in the areas of common knowledge needs and computer-assisted instruction using multimedia (CAI).

Teachers from urban areas have higher needs for increasing knowledge than teachers from rural areas, while teachers from rural areas have higher needs for computer-assisted instruction using multimedia.

Table 6.24. Teachers' professional development needs

Percentage of teachers indicating a need for professional development in the following areas (N=1 949)

Professional development needs	Percentage
New concepts and theories in teaching and learning	39.5%
Subject-matter knowledge	47.3%
Common knowledge (humanities and nature)	37.6%
Pedagogy (teaching strategies)	50.3%
Multimedia teaching technology strategies	40.9%
Classroom management strategies	42.5%
Learning from model teachers	65.8%
Educational research methodology	38.2%
Others	1.1%

Barriers to participating in professional development activities

In Beijing three main reasons seem to prevent teachers from undertaking more professional development: *i)* administrative problems, *e.g.* too heavy a workload or scheduling conflicts; *ii)* unqualified or incompetent instructors; and *iii)* personal problems, *e.g.* family problems.

Table 6.25 shows that the main problem is instructors who do not provide training related to teaching (49.9%), do not provide subsequent feedback (39.7%), or have insufficient skills (27.5%), use inappropriate pedagogy (22.5%), or present the training content in a non-systematic way (21.8%). The other main barriers are administrative: heavy workloads and conflicts with work schedules. The least important factor is family problems: only 14% of teachers think these hinder participation in professional development activities.

Table 6.25. Main reasons for not participating in more professional development, 2004-07

Percentage of teachers mentioning the following barriers to participation in professional development (N=1 904)

Factors	Percentage
Training content not related to teaching	49.9%
Heavy workload	44.3%
No continued tutoring	39.7%
Scheduling conflicts	34.4%
Instructors with insufficient skills	27.5%
Inappropriate pedagogy	22.5%
The training content is not systematic	21.8%
Family problems	14.0%
Others	1.4%

6.3 Mentoring and induction programmes

In TALIS induction takes the form of school policies and practices to support teachers who are either new to the profession or new to the school and is considered as an important type of support for teachers' development. Beginning teachers face challenges such as motivating students to learn, classroom management, dealing with individual differences among students, assessing students' work, and communicating with parents. Induction and mentoring programmes may help new teachers cope with these challenges and combat the likelihood that they may leave the teaching profession early (OECD, 2005). In the TALIS survey a mentor is defined as a person who is assigned to a new teacher to help and advise him/her.

Induction is generally seen as a support programme for new entrants to the teaching profession. Official definitions of induction vary, as do the forms that induction may take and the ways it is organised. In some countries, induction is aimed at new teachers who have completed initial teacher education, have attained the relevant qualification (a degree), and have obtained the relevant licence or permission to teach. In other countries, induction is aimed at teachers who have the required qualification but not yet a licence to teach; in these cases, they are

regarded as "candidate" or "probationary" teachers or "trainees" and the induction phase may end with a formal assessment of their teaching skills and a decision about their entry into the profession. In other countries, an induction system is aimed at teachers who are not yet qualified and do not have a licence to teach; in such cases the division between initial teacher education and induction becomes blurred (European Commission, in preparation).

Below, as far as available, information is provided on induction and mentoring policies and practices for new teachers in EU countries and major economies that did not participate in the first round of TALIS: Cyprus, the Czech Republic, France, Greece, Liechtenstein, the Netherlands, the United Kingdom (England and Scotland), Switzerland and China. Data on teachers' experience with early professional development (*i.e.* professional development that takes place during the first and second year of teaching as part of their induction period) are presented as well.

Cyprus

Policy context

Induction and mentoring of teachers has been offered in Cyprus since October 2008 and will continue to be offered in the future for all new primary, secondary and vocational education teachers in their first and second year of appointment. The aim of the programme is to support newly appointed teachers in terms of their personal/emotional needs; their professional and practical needs, and the development of their critical reflection in relation to their teaching practice. Novice teachers' mentors, who work with them at the same school, also help them meet their needs.

The programme is aimed to prepare both new teachers and their mentors (experienced teachers) in order to facilitate new teachers' induction into the profession. The mentors attend special training programmes offered by the Cyprus Pedagogical Institute (National Summary Sheets on Education Systems in Europe and Ongoing Reforms: Cyprus, 2008). In addition to their mentor, beginning teachers are also supported by their support group, a group of teacher

trainers from the Cyprus Pedagogical Institute who are responsible for visiting schools where mentoring takes place and for offering support.

Evidence

In 2008/09 50 new secondary education teachers and 49 secondary education mentors participated in the programme. This is approximately 45% of the new teacher population.

A first evaluation (October 2008-May 2009) indicated that over 90% of the participants had a mentor in their own specialisation. Evaluations also indicated that both mentors and new teachers view the programme (especially mentoring) as successful and indicated certain areas for improvement, such as more time, less paperwork and a better relation with the support group.

Newly appointed teachers do not have a lighter teaching workload than their colleagues (Eurybase, The Education System in Cyprus, 2007/08).

Czech Republic

Policy information

In the Czech Republic the Labour Code requires employers to provide school leavers (up to two years after completing pre-service training) professional practice and introduction into the job. The actual forms of introducing beginning teachers are not set by legislation; the form of induction depends on the school head. The school head can assign a senior teacher to a new teacher, who helps him/her during the beginning of teaching practice. New staff members do not have a reduced workload. A new entrant may obtain advice, information and informal feedback from the management, take advantage of classroom observations, etc. Introducing teachers to work is monitored by the Czech School Inspectorate (Eurybase, The Education System in the Czech Republic, 2007/08).

Evidence

There are no data available on induction and mentoring in the Czech Republic.

France

Policy information

In France, access to the profession takes place by means of a competitive examination, followed by an in-class placement which must be validated by a *certificat d'aptitude* (enabling certificate). Teachers who are successful in competitive examinations for permanent posts are offered teaching positions in an *académie*.

Secondary institutions receiving new permanent teachers organise their pedagogical support. The idea is to create an environment supportive of new teacher and to facilitate the implementation of all aspects of their discipline, didactic and pedagogical skills. Institutions receiving new permanent teachers must:

- Carry out a training process in partnership with the university and integrated teachers' training institute (IUFM);
- Answer teachers' professional questions and provide information on the objectives of the training;
- Promote teachers' involvement in teamwork and pedagogical consultation, and meetings with parents and the various partners.

Studies carried out within the school on the activities offered are an integral part of the introduction and support of new teachers. New teachers also benefit from the help of a reference or tutor teacher (Eurybase, The Education System in France 2007/08).

Evidence

The results of the 2005 survey by the Direction de l'évaluation, de la prospective et de la performance (DEPP) show that the vast majority (90%) of new secondary school teachers received continuous professional development in their first two years in the profession in order to complete their knowledge and competences (Cambe and Branellec, 2006).

Greece

From 2000, induction has been obligatory for all newly appointed teachers in Greek primary and secondary schools during their first year. Induction is carried out in the 16 regional further education centres (PEK).

Attendance at the induction programme is free. The salaries of the principals of the 16 regional further education centres and the trainers of the induction programme are covered by the Greek Ministry of National Education and Religious Affairs and European Union funding. Teachers do not get additional pay or bonuses for attendance. The induction programme is divided into three parts: the first lasts 60 hours, the second 35 hours and the third 5 hours. During the first and second parts, teachers receive a leave of absence/permission to attend. In the second part, teachers have the chance to work with experienced teachers. A school advisor is usually present but does not interfere with the teaching process but organises the discussion on methodology and subject specialisation issues which follows. During the third part, assessment issues are covered. Since 2008/09, supply (substitute) teachers have also been given the opportunity to attend the first part of the induction.

There is no formal mentoring programme in Greece.

Liechtenstein

Because Liechtenstein is such a small country, it cannot provide its own teacher training programmes for different types of school and subject areas. The majority of Liechtenstein's teachers are trained in Switzerland and to a lesser extent in Austria (Eurybase, The Education System in Liechtenstein, 2007/08).

For new entrants into the profession the Office of Education or an institution appointed by the government conducts professional development courses for probationary teachers. The training programmes consist of blocks of 10-15 days and are held during school holidays or in non-contact teaching time. They include courses on Liechtenstein's history, civic affairs and education

legislation, and topics such as mentoring, the education system, timetables, special needs teaching and educational therapy, quality assurance and development, the schools inspectorate and staff communications, pupil-assessment and parent-teacher discussions, the school intranet, computers and information technology and the didactic media centre (Eurybase, The Education System in Liechtenstein, 2007/08; Verordnung zum Lehrerdienstgesetz (Lehrerdienstverordnung LdV).

The school inspectors for the individual school types or subject areas are responsible for teacher supervision and care. They conduct periodical classroom visits followed by a detailed assessment and discussion. If necessary, the teacher and the inspector agree on measures to be taken (Eurybase, The Education System in Liechtenstein, 2007/08).

In the first year of service a novice teacher may ask for a tutor for assistance with teaching practice. During this period the novice teacher has a reduced teaching load (Eurybase, The Education System in Liechtenstein, 2007/08).

The Netherlands

Policy information

In the Netherlands, school boards are responsible for supervising new teachers (Eurybase, The Education System in the Netherlands, 2007/08). From 1 August 2009 teachers new to the profession receive a reduced teaching loads of no more than 80% of the standard load (Collective Labour Agreement Secondary Education 2008-10).

Methodology

Every two years, at the request of the Ministry of Education, Culture and Science the position of new teachers who graduated from teacher training is monitored. In 2009, special attention is given to the guidance and mentoring of starting teachers who graduated from teacher training in 2008. These teachers started working in education from 2004.

The reference period is April 2009, and the data refer to starting secondary teachers, *i.e.* those who

started working no earlier than 2004 (Leenen and Berndsen, 2009).

Evidence

Less than half of the starting secondary teachers (41%) who graduated in 2008 from teacher training had received guidance by April 2009 (Table 6.26). Of these, 18% received hardly any guidance and 26% only during the first months or weeks. Just 6% of teachers reported receiving guidance during their first and/or second year of teaching.

Teachers who indicated that they had received some guidance were subsequently asked about the organisation of the guidance. Teachers could give more than one answer. More than half of all new secondary teachers reported that they received one or more of the following types of guidance: guidance by a mentor/coach (51%), guidance by an experienced teacher from the same subject department (53%) and joint meetings with a group of new teachers on a regular

basis (55%). Also, one-third of the new teachers (33%) reported that a number of their lessons were visited by an experienced teacher (Table 6.27).

Teachers who indicated above that they had received some guidance could mention a maximum of three types of guidance. In decreasing order they reported: the organisation of the school (57%), dealing with pupils (44%), maintaining order in the classroom (38%), a guided tour in the school/getting acquainted with colleagues (32%), didactical skills (29%), planning of activities (13%), dealing with parents (10%), preparation of lessons (10%), and other (7%).

Concerning reduced class time, 69% of the 580 starting secondary teachers indicated that they did not receive any reduction in class time and had to teach the full number of hours for which they were appointed from the beginning, 21% received a reduced workload and 10% did not know (Leenen and Berndsen, 2009).

Table 6.26. Duration of guidance for new secondary teachers

Percentage of beginning secondary teachers who received a specified period of guidance: secondary teachers who graduated from teacher training in 2008 and work in a regular job in secondary education

Duration of period of guidance	Secondary education N = 580
None or almost no guidance	18%
From the beginning up to now	41%
During the first and/or second year	6%
During the first two months	21%
During the first weeks	5%
Just at the start	8%
Other*/does not apply	1%

*The category other also includes guidance received at a later point in time.

Table 6.27. Percentage of new secondary teachers receiving specified types of guidance since starting to teach (only teachers who indicated that they had received guidance)

Type of guidance activity	Secondary education N= 520
Guidance by a mentor	51%
Guidance by a experienced teacher from the same subject department	53%
Guidance by school management	21%
Joint meetings with a group of new teachers on a regular basis	55%
An experienced teacher visits a number of lessons of the new teacher	33%
Training course is offered	13%
Other/does not apply	3%

Switzerland

Policy information

In Switzerland there is no particular phase of induction after graduation as a lower secondary teacher.

United Kingdom (England)

Policy information

In England, the Teaching and Higher Education Act of 1998 introduced arrangements to provide all newly qualified teachers with a period of monitoring and support during their first year in the profession. Since May 1999, all newly qualified teachers in England have been required to serve an induction period of three school terms, which must be satisfactorily completed to national standards. Revised induction standards, known as the "core standards" apply to all newly qualified teachers starting induction from September 2007. The core standards set out requirements in terms of the professional attributes, knowledge and understanding and skills which all newly qualified teachers are expected to possess by the end of their induction period. The core standards are part of the framework of professional standards for teachers. Newly qualified teachers who do not satisfactorily complete the statutory induction period will not be eligible for employment as teacher in a maintained school (Eurybase, The Education System in England, Wales and Northern Ireland, 2007/08).

The induction period combines a personalised programme of development, support and professional dialogue, with monitoring and an assessment of performance against the core standards. The head teacher has a duty to ensure a reduced workload for teachers taking part in induction, i.e. no more than 90% of the normal time (Eurybase, The Education System in England, Wales and Northern Ireland, 2007/08).

The Training and Development Agency for Schools (TDA) is undertaking a three-year project (2006-09) to provide guidance to better support teachers in their second year of teaching. However, there are no plans to introduce such a scheme nationally.

Methodology

The *Becoming a Teacher* (BaT) study is a six-year longitudinal research project (2003-09) that explores beginner teachers' experience of initial teacher training (ITT), induction and early professional development (EPD) in England. Methods of data collection include a longitudinal questionnaire survey based on an initial target sample of approximately 5 000 trainee teachers, in-depth interviews with a sub-sample of trainees/teachers, interviews with ITT course leaders, tutors and mentors and interviews with induction tutors/mentors

In England, the research findings are informing policy development on initial teacher training, induction and early professional development. In particular, the study aims to support teacher retention by investigating the differential impact of initial teacher training, induction and early professional development experiences on teachers' attitudes to, and choices about, their teaching career.

For the survey sample a total of 110 initial training providers were approached (in 2003) to participate in the initial (wave 1) survey; of these, 74 took part. The questionnaire was completed by 4 790 student teachers from these providers. Subsequently, 3 162 trainees took part in the follow-up wave 2 telephone interview; 2 446 (then) newly qualified teachers took part in wave 3; and of these, 1 973 (then) second-year teachers took part in the wave 4 telephone survey. The survey sample included both primary and secondary education teachers. The results of the surveys from the third and fourth waves (Hobson *et al.*, 2007; Tracey *et al.*, 2008), are of particular importance for this study as they refer to teacher in their first and second years of their jobs. The reference period of the wave 3 telephone survey (new qualified teachers' experiences in their first year) is summer 2005; the reference period of the wave 4 telephone survey (teachers' experiences of their second year in post) is summer 2006.

Evidence

Of all the wave 3 survey respondents who worked as teachers since completing their initial teacher training, 88% indicated that they had had access to a formal induction programme. The other 11% indicated that they did not.

Factors which helped newly qualified teachers to work towards meeting the induction standards were colleagues at school/college (44%), an induction tutor/mentor (41%), the head of department (11%), contact with other newly qualified teachers (7%), the line manager (6%), the head teacher/principal (6%) and the presence of a newly qualified teachers' co-ordinator (6%).

Barriers

The majority (54%) of newly qualified teachers who had access to a formal induction programme reported that nothing had hindered them from working towards the standards. In addition 94% reported very good or good relations with their mentor, especially if the mentor worked in the same subject area.

Barriers that newly qualified teachers experienced included heavy workload (11% of teachers), lack of support from other staff (5%), teaching pupils with challenging behaviour (3%) and workload insufficiently reduced (4%). Concerning support, 4% of

teachers referred specifically to a lack of support from their induction tutor, 3% to a lack of support from their head teacher and 2% to a lack of support from their head of department.

Early professional development

In the telephone surveys, newly qualified teachers in their first year of teaching (wave 3 of the study) as well as teachers in their second year (wave 4 of the study) were asked for their experience with early professional development. Among new qualified teachers in their first year of teaching and teachers in their second year, 88% reported that they had undertaken professional development during their first or second year, respectively.

The most frequently mentioned additional training or professional development received by teachers in the second year were training related to teaching and learning approaches (34%), subject-specific training (34%) and subject-specific training related to teaching and learning approaches (27%) (Table 6.29).

Table 6.28. Percentages of primary and secondary teachers in their second year in post undertaking specified professional development activities¹ (N = 1 451)

Type of professional development activity	(%)
Training related to general teaching/learning approaches	34%
Subject-specific training	34%
Training related to subject-specific teaching/learning approaches	27%
Training related to specialisation-specific teaching/learning approaches (e.g. special education needs, English for speakers of other languages)	13%
Training to develop pastoral skills/knowledge/role (e.g. child protection)	10%
Management and leadership training	9%
Assessment training	3%
Inset/other in-house training	3%
Behaviour management training	3%
ICT training	2%
Literacy/numeracy	1%
Health and safety/first aid	1%
Professional development training	1%
Newly qualified teacher training	1%
Training to work with gifted/talented pupils	1%
Other	6%
No training	12%

1. Includes all who had completed their induction at the end of their first year of teaching and were working as a teacher or were not teaching but were intending to do so in the future and had done so in the last academic year. Respondents could give more than one response.

In addition, since completing their initial teacher training, almost all teachers (99%) in their second year in post reported taking part in collaborative professional development activities. The activities teach-

ers most frequently reported having taken part in were sharing of teaching resources (92%), and joint in-service training days with colleagues from other departments/key stages/year groups (86%).

Table 6.29. Participation rates by type of collaborative professional development activities

Percentage of primary and secondary teachers in their second year in post undertaking specified collaborative professional development activities since they started teaching¹⁾ (N=1 451)

Type of collaborative professional development activity	(%)
Sharing of teaching resources	92%
Joint in-service training days with colleagues from other departments/key stages/year groups	86%
Joint in-service training days with colleagues from other schools	59%
Team teaching	58%
Joint professional development with colleagues from other departments/key stages/year groups	53%
Staff exchanges/joint teacher meetings with colleagues from other schools	37%
Joint professional development with colleagues from other schools	29%
Sharing good practice with an online peer community	21%
None of these	(0) %

1. Includes all who had completed their induction at the end of their first year of teaching and were working as a teacher or were not teaching but were intending to do so in the future and had done so in the last academic year. Respondents could give more than one response.

Professional development needs of teachers in their second year in post

Finally, teachers in their second year were asked to report in an open-ended survey which additional professional development they would like to receive in their third year of teaching. The most

frequent responses given were: knowledge about my teaching subject(s) (15%); staff supervision/management skills (13%); subject co-ordination (9%), ability to work with pupils with special educational needs (9%), marking and assessments (8%), using ICT in subject teaching (7%) and knowledge of general subjects/skills (7%) (Table 6.30).

Table 6.30. Percentage of second year teachers indicating need in the following areas in their third year of teaching, 2006-07 (N = 1 420)

Professional development needs	(%)
Knowledge about my teaching subject(s)	15%
Staff supervision/management skills	13%
Ability to work with pupils with special educational needs (SEN)/inclusion	9%
Subject co-ordination	9%
Marking and assessments	8%
Using ICT in subject teaching	7%
Knowledge of general subjects/skills	7%
Knowledge about other teaching subjects	5%
Teaching A-level	5%
Ability to maintain discipline in the classroom	4%
Knowledge/understanding of pupil motivation and behaviour	4%
Knowledge/understanding of national curriculum	4%
Ability to use a range of teaching methods	4%
Teaching literacy/numeracy skills	4%
Planning/organising	3%
Ability to deal with pastoral issues	2%
Knowledge/understanding of the principles of assessment for learning	2%
Differentiation	2%
Ability to work with gifted/talented pupils	2%
Ability to work with early years pupils	2%
Ability to work with pupils with English as an additional language (EAL)	2%
Awareness of research findings about effective teaching methods	2%
Ability to work with different key stage groups	2%
Time management skills	2%
Teaching General Certificate of Secondary Education (GCSE)	1%
Training using specialist equipment	1%
Developing my confidence as a teacher, generally	1%
Knowledge/understanding of education policy	1%
Training in student mentoring	1%
Ability to develop productive relationships with parents	(0)
Training in exam preparation	(0)
Master's degree	(0)
Other	9%
None	4%
Don't know	6%

United Kingdom (Scotland)

Policy information

In Scotland, all newly qualified teachers who wish to work in publicly funded schools are required to complete a period of probation before being awarded full registration as a teacher with the General Teaching Council for Scotland (GTCSC). Scottish-trained, newly qualified teachers are eligible for a guaranteed one-year teaching post with a Scottish local authority. This scheme has been in operation since August 2002 and is known as the Teacher Induction Scheme. The scheme makes a number of provisions for newly qualified teachers such as:

- a maximum class commitment time, equal to 70% of that of a full-time teacher, with the remaining 0.3 FTE set aside for professional development;
- access to the services of an experienced teacher who will provide support and act as a mentor;
- 0.1 FTE funding per newly qualified teacher to local authorities for the provision of a mentor (HM Inspectorate of Education, 2008).

Methodology and evidence

Data on induction refer to the number of newly qualified teachers in the Teacher Induction Scheme and are collected by the General Teaching Council for Scotland. In the school year 2008/09 1 350 secondary teachers participate in the Induction Scheme (General Teaching Council for Scotland, 2009).

China

Policy information

In China a special regulation indicates that new teachers should follow at least a 120-hour intensive training (China, Education Ministry, 1999) during a probation period. Induction of new teachers takes place mainly by "gathered training" and the mentor-novice model within schools.

Gathered-training: In 1999, a publication of the Ministry of Education (Primary and Secondary School Teachers Continuing Education Regulation) stated that teachers' induction should be carried out by the local teachers' administration departments. Those departments and local normal university and teacher training centres formed a principal-agent relationship, in which universities and schools take responsibility for training teachers. Some schools require one to two years of training before new teachers start to teach. Some provide periodical collective training divided into several short periods, such as a half year, or several periods of ten days, or some workdays in the semester. The content of gathered training usually includes: psychological adjustment of teachers, methods and practices in dealing with teenage behaviour, classroom management strategies, pedagogical concepts and principles, curriculum standards and planning, tutoring and evaluation methodology, and social methods and practice. In addition, other types of professional development (learning from model teachers and visiting schools) are also open to novice teachers.

The mentor-novice model within schools is a traditional Chinese model for induction of beginning teachers. Senior teachers and beginning teachers have a master-apprentice relationship. Through mentor teachers' assisted performance – passing on their experience to novice teachers in a practical way – beginning teachers are instructed in the classroom. The mentors are appointed with an official certification, and generally have a rich pedagogical experience and are highly qualified. At school level mentors are required to observe a certain amount of beginning teachers' classes, check their teaching planning, instructing them in lesson preparation, etc.

Methodology and evidence

Survey results of 366 beginning teachers in 2007 show that 97.3% of new teachers participated in gathered training. With regard to content, 86% of new teachers were trained in pedagogical methods and 4.5% in using information technology. Professional ethics, new curriculum reform, classroom management strategies, and subject matter knowledge account for 2% each. The remaining content

areas were research methods and learning from pedagogical experience (Pan, 2008). The results show that the content of the gathered training focuses mainly on general pedagogy. Less attention is paid to pedagogical practices, teenage psychological development and classroom management.

In the survey of 366 beginning teachers, 91.8% (336) reported that they had a subject-based mentor. However, beginning teachers were not very positive about the professional skills of their mentor: less than half of the beginning teachers (41.8%) reported that their mentors were qualified. The percentage of beginning teachers reporting their mentors as responsible was much higher (90.2%) (Table 6.31). The results indicate the need to improve the professional qualification of mentors and to choose mentors according to strict selection procedures.

Table 6.31. Beginning teachers' perceptions about the personal and professional skills of their mentor (N=336)

Personal and professional skills	Number	Percentage
Mentor is responsible and qualified	132	36.1%
Mentor is responsible but not qualified	198	54.1%
Mentor is not responsible but qualified	21	5.7%
Mentor is neither responsible nor qualified	15	4.1%

6.4 Conclusion: professional development and induction and mentoring of teachers in countries that did not participate in TALIS

The European Commission requested an overview of teachers' professional development in EU countries, EU candidate countries and EEA countries that did not take part in the first round of the TALIS survey, as well as in four other major economies outside the EU (the United States, China, India and Japan). To obtain such data, national contact persons were found in nine EU countries that did not

participate in TALIS (Cyprus, the Czech Republic, Finland, France, Greece, Liechtenstein, the Netherlands, Sweden, the United Kingdom (England and Scotland), as well as in Switzerland and China (Beijing).

For professional development, the data sources were teacher sample surveys (Cyprus, Finland, France, Greece, Germany, the Netherlands, Sweden, England, China), national statistics (Cyprus, Finland, the Netherlands, Sweden, Scotland) and data collected by the Inspectorate (the Czech Republic).

The reference period of the data sources varied from the school years 2002/03-2004/05 (France) to the school year 2008/09 (the Netherlands and Sweden). Countries that reported data from reference periods comparable to the reference period in TALIS were Cyprus, the Czech Republic (2007/08, Finland (calendar year 2007), Germany, the Netherlands and Sweden (for each term in the school years 2007/08 and 2008/09). However, except for Germany, none of the reference periods was equal to the 18-month period covered by TALIS.

As was expected, the content areas of the TALIS survey (such as amount, type and perceived impact of teachers' professional development, the support that teachers receive and the needs and barriers they perceive for participation) did not fully match the content of the surveys and national statistics from most of the non-participating countries. When similar areas were covered, the specific questions tended to differ as well. As the structure of the questionnaires and the way in which the statements are formulated can influence responses, extreme caution must be taken when interpreting the data presented in the summary tables in this section.

The same is true for the data on professional development reported by Germany and the Netherlands, which did use the TALIS questionnaires:

- The Netherlands did participate in TALIS, but did not meet the sampling requirements agreed by the TALIS Board of participating countries. The data reported here are based on the responses of the 657 teachers who returned the teacher

questionnaire. The Dutch data are not representative of all Dutch teachers.

- Germany did not participate in TALIS. In the autumn of 2008, the German Education Union (Gewerkschaft Erziehung und Wissenschaft – GEW) decided to administer an online survey for their members, based on the Austrian TALIS questionnaires (Institut für Sozialwissenschaftliche Studien & Gewerkschaft Erziehung und Wissenschaft, 2009). In total, 3 734 teachers and 388 school leaders of all educational levels completed the online questionnaire. The German sample consisted of teachers and school leaders who are members of the German Education Union (GEW), as well as of non-members (Saldern, 2009). The GEW survey did not attempt to follow the TALIS methodological standards and the sample is not representative of all German teachers.

Levels and intensity of participation in professional development activities

Data on teachers' participation in professional development in these countries are very limited (Table 6.32). In France and Germany there are data on the percentage of teachers who undertook a specified number of days of professional development. In Sweden and Scotland data on participation are only available for the number of teachers who applied for or participated in specific nationally regulated professional development activities (*i.e.* the "Boost for teachers" initiative in Sweden and participants in the teacher programmes for career standards in Scotland). In the Netherlands data are available for teachers participating in courses and programmes under the teacher development grant and for the 657 teachers who completed the TALIS questionnaire. In France 69% of teachers participated in professional development in 2002/03, 2003/04 and 2004/05. Approximately half of these teachers spent less than three days, around 40% spent from three to six days, and 10% spent more than six days. In Germany, teachers who completed the online questionnaire of the GEW in autumn 2008 had on average nine days of professional development in the 18 months prior to the survey. In the Netherlands the lower secondary teachers

who completed the TALIS survey had on average 13.5 days of professional development over the survey period.

In the Netherlands in 2008/09 a teacher development grant was awarded to 3 920 secondary teachers. In Sweden 772 teachers (all educational levels) participated in a course organised by the Swedish National Agency for Education under the "Boost for teachers" initiative in 2007 and 5 695 in 2008. In Scotland in 2008, 803 teachers were undertaking the standard for chartered teacher programme, seven the standard for headship programme, and six teachers achieved the standard for headship programme.

In Finland, Statistics Finland collects data through school surveys on the number of teachers who participate in professional development and the number of days (both during working hours and after working hours) that teachers spend on four types of professional development activities (training leading to qualifications, programmes leading to a degree, professional development organised by the employer, and other professional development activities). In 2007, 68% of all Finnish teachers participated in professional development activities. On average teachers who participated in professional development in 2007 spent 9.1 days; for all teachers, including those who did not participate, the average is 6.2 days. Those who participated spent on average 4.6 days during working time and 4.5 days after working time. Professional development activities leading to qualifications and programmes leading to a degree are usually organised after working time, professional development activities by the employer mainly during working time, and other professional development activities both during and after working time.

In two countries the data included region-specific information. In the Czech Republic the proportion of teachers undertaking professional development varied from 48% to 65% in the 14 regions. A national sample survey in Finland, administered in 2005, showed that the percentage of teachers participating in professional development appeared to be lower in northern Finland and in rural municipalities than in the rest of the country.

Types of continuous professional development undertaken

Data on the types of development undertaken are available in eight of the countries that did not participate in first round of TALIS: Cyprus, France, Germany, the Netherlands, Sweden, the United Kingdom (England) and China (Beijing) (Table 6.33).

In Sweden (the “Boost for teachers” initiative) and Scotland (teacher programmes for career standards), the available data refer to one or two specific types of professional development activities (*i.e.* qualification programmes and courses). In the Netherlands data are available for teachers participating in courses and programmes under the teacher development grant and for the 657 teachers who completed the TALIS questionnaire (Table 6.33). As mentioned, 772 teachers (all levels of education) participated in a course organised by the Swedish National Agency for Education under the “Boost for teachers” initiative in 2007 and 5 695 in 2008. In Scotland in 2008, a total of 816 teachers participated in programmes for career standards. In the Netherlands, a high percentage of secondary teachers undertake qualification programmes. Almost two-thirds of the secondary school teachers who received a teacher development grant in the first period (spring 2008) follow a teacher training programme at the bachelor’s level (HBO-based teacher training), the master’s level (university-based teacher training) or an unknown level.

In Cyprus, in addition to qualification programmes, data are also available on different types of education conferences and seminars. As Table 6.33 shows, education conferences and seminars appear to be the most common type of professional development undertaken; compared to the EU (TALIS average), relatively high proportions of teachers reported having engaged in this activity in 2007/08.

In China (Beijing), between 2004 and 2007, courses and workshops and participation in teacher research group activities are the most frequently reported development activities. Training relating to the new curriculum reform and continuing education for the required 240 hours of training in a five-year cycle are the most common types of

courses. The percentage of teachers participating in this training (83.2%) is close to the TALIS average (81.2%). In teacher research groups teachers try to improve their teaching and research in different ways, *e.g.* collective lesson planning, observing and assessing lessons. Therefore, some of the types of professional development activities covered in TALIS (professional development network, individual and collaborative research, and mentoring and peer observation) might take place here as well.

In England data on the types of professional development considered in TALIS are available for three reference periods (2006, 2005 and 2004). Data are also available for more detailed categories of professional development. The data reported in Table 6.33 refer to 2006. In England in 2006 the most frequently reported types of professional development were courses held at school level (INSET days) (89.6%), being observed by colleagues (82.7%), collaborative learning with colleagues in the school (81.5%), taking an active part in school self-evaluation (83.0%), and development/learning individually (this includes reading professional literature, among others), and participating in external courses (78.2%). For each of the professional development activities defined in TALIS for which data from England are available, the percentage of teachers in England participating is higher or much higher than the EU (TALIS) average. Qualification programmes are not reported as a separate activity in England.

For Germany percentages of teachers participating in different types of professional development activities are lacking. However, the first results of the survey by the GEW show that the participation rates of teachers who completed the online survey correspond approximately to the average rate of participation in the TALIS countries with regard to courses and workshops, education conferences and seminars, observation visits to other schools, professional development networks, and informal dialogue to improve teaching. Compared to teachers in the TALIS countries, the participation rate of German teachers was higher in reading professional literature and observation visits to other schools and lower in individual and collaborative research and qualification programmes.

The types of professional development most frequently reported by Dutch teachers who completed the TALIS questionnaire were informal dialogue to improve teaching (94.1%), courses and workshops (86.7%) and reading professional literature (84.4%). Participation among Dutch teachers who completed the questionnaire was lowest on observation visits to other schools (24.8%) and participation in professional development networks (25.8%).

With the exception of Germany and the Netherlands, data on observation visits to other schools and informal dialogue to improve teaching do not appear to be available in the non-TALIS countries.

Support received by teachers for professional development

With the exception of the Netherlands, no data on support appeared to be available from teacher surveys and national statistics.

Among Dutch teachers who completed the TALIS questionnaire and were engaged in some professional development, professional development was free for 77.9%. Almost 7% reported having had to pay all the cost and a further 15.5% paid some of the cost. Two-thirds of the teachers (67%) received scheduled time to take part in professional development (Van Cooten and Van Bergen, 2009).

Professional development needs

Data on the percentage of teachers with development needs regarding various aspects of their work are available for Cyprus, England, Germany, Greece, the Netherlands and China (Beijing) (Tables 6.32 and 6.36). In the Czech Republic teachers' professional development needs specifically refer to courses and seminars in the areas of innovation of educational content (subject field) and ICT teaching skills. In Germany more than half of the teachers who completed the survey from the GEW reported high development needs with regard to student discipline and behaviour problems.

In Sweden the courses organised under the "Boost for teachers" initiative focus mainly on improvement of teaching and learning in subject fields, instructional

practices, and student assessment practices, as well as on teaching special learning needs students.

High percentages of professional development needs in aspects of teachers' work that concern the primary processes in schools are reported by teachers for all five countries for which data are available (Cyprus, England, Greece, the Netherlands and China) (Table 6.36). The aspects of the teaching and learning process for which sizeable proportions of teachers in these countries reported development needs are subject fields, instructional practices, ICT teaching skills and teaching special learning needs students. In Greece, high percentages of professional development needs were reported for almost all aspects of teachers' work. The percentages reported in Cyprus, England, Greece and China (Beijing) seem to be higher than the EU (TALIS) average and the TALIS average. This is also the case for professional development needs in most of the aspects of teachers' work in the Netherlands. However, high development needs in three aspects of teachers' work (teaching special learning needs students, school management and administration, and teaching in a multicultural setting) are reported by a below-average proportion of the Dutch teachers who completed the TALIS survey. The percentages presented in the TALIS averages refer only to teachers who reported a high level of need in each of the aspects of their work. In TALIS teachers were asked to report on a four-point scale the degree of their development need.

In France data are not available on the development needs of teachers but the survey that was administered asked teachers about the content of the last professional development course they had followed and thus provides somewhat comparable information. Subjects reported by 10% or more of the 763 teachers who answered the question mainly focused on the teaching and learning processes, such as subject field (29%), instructional practices (in subject areas) (21%), ICT (21%), ICT teaching skills (integration of ICT in teaching) (10%), student assessment practices (evaluation of students) (10%). In Sweden, data on the development needs of teachers are also lacking but are available on the ratio of applicants to the number of places offered for courses in areas related to the "Boost for teach-

ers" initiative. The ratio is highest in the areas of special needs education, mathematics, and Swedish and Swedish as a foreign language; this shows that courses in these areas are in great demand.

In France, Sweden and China the areas of professional development need mainly seem to relate to the primary process, but in England, Cyprus, the Czech Republic and Greece, teachers also frequently reported development needs in other aspects of their work considered in TALIS, such as student discipline and behaviour problems, school management and administration, and teaching in a multicultural setting. Other aspects of their work for which teachers reported professional development needs were:

- Cyprus: civic education (36.2%), curriculum development at school level (37.3%) and educational psychology (42.8%);
- England: personalised learning (36.6%), teaching pupils with English as an additional language (18.0%), teaching citizenship (24.2%) and school self-evaluation (29.3%);
- China (Beijing): educational research methodologies (38.2%).

Perceived impact of professional development

TALIS asked teachers to report on the impact of their development activities on their development as a teacher for each of the types of development they had undertaken during the survey period.

Among the countries that did not participate in the first round of TALIS, some information about the impact of courses is available from France, Germany, Greece, the Netherlands and Sweden (Tables 6.32 and 6.36). In France the survey on secondary school teachers administered in 2005 asked about the most important impact of the last professional development course they had followed. Exchange of educational practices was mentioned as having the most important impact by 37% of teachers followed by improvement of classroom practices (17%), enhancement of the pedagogical culture (17%) and better

use of ICT (12%), while 2% of teachers reported no impact and 7% other impacts.

German teachers who completed the online survey view the impact of five types of professional development activities (courses and workshops, education conferences and seminars, qualification programmes, observation visits to other schools and reading professional literature) on their development as a teacher less positively than the TALIS average. The impact of other types of professional development (professional development, individual and collaborative research, mentoring and peer observation and informal dialogue to improve teaching) corresponds to the TALIS average.

In the Netherlands, the 657 teachers, who completed the TALIS questionnaire, reported qualification programmes and individual and collaborative research activities as the most effective types of professional development and education conferences and seminars as the least effective.

In Greece, almost half of the 4 000 primary and secondary teachers who attended the training programme "Managing Problems in School Class" reported that the programme had a great impact upon their development as a teacher, and another 36% assessed the impact as sufficient.

In Sweden the results from a survey of 519 teachers who participated in 2007 and 2008 in the courses organised under the "Boost for teachers" initiative, indicate that these teachers were quite positive about the impact of the course on their development as a teacher: 68.8% reported that the course has given them additional subject knowledge to a high or very high extent and 66.7% reported that the course has given them additional teaching skills to a high or very high extent.

Barriers preventing teachers from participation in professional development

In the first round of TALIS teachers were asked to report on what had prevented them from participating in more professional development than they

did. Teachers were entitled to select as many of the options as appropriate.

Among countries that did not participate in the first round of TALIS data on barriers that prevent teachers from participation in professional development are available for Cyprus, France, Germany, Greece, the Netherlands, the United Kingdom (England) and China (Beijing) (Table 6.33). For the Czech Republic the reasons are reported but data are not available (Table 6.33).

The most frequently reported reason for not participating in (more) professional development in countries that did not participate in TALIS and for which data are available is conflict with work schedule. This is also one of the two most commonly cited reasons for not participating in more professional development in EU countries, the other being no suitable professional development. The other barriers defined in TALIS were cited by fewer countries. Teachers in the Czech Republic, Germany, Greece, the Netherlands and the United Kingdom (England) cited too expensive and teachers in France, Germany, the Netherlands and China cited no suitable professional development. Teachers in England and the Netherlands cited lack of employer support and teachers in the Netherlands and China (Beijing) cited family responsibilities.

The percentages of teachers reporting reasons for not participating in more professional development as a barrier in France and the United Kingdom (England) were substantially lower than the EU (TALIS) average. In China (Beijing) the percentage of teachers citing conflict with work schedule and no suitable professional development are comparable with the TALIS average, while in Germany they are substantially higher.

Other reasons for not participating in more professional development were:

- Cyprus: lack of information about professional development, place of professional development activity, unsatisfactory level of professional development;
- the Czech Republic: place of professional development activity (transport difficulties from smaller communities);
- France: undertaking professional development not judged useful (19%), preparation of pupils for exams (11%), lack of supply (10%), personal reasons (7%);
- Greece: insufficient information about professional development (39%), limited number of teachers admitted to a course (36%), other reasons (2%);
- United Kingdom (England): not offered the opportunity to attend sessions (10%).

Induction and mentoring

In first round of TALIS, school level data on formal policies and practices for induction and mentoring of new teachers was obtained from school principals rather than from teachers. For some of the countries that did not participate in the first round of TALIS, data on the existence of induction and mentoring programmes and on the percentages of teachers participating in these programmes are available from national statistics and teacher surveys as well as from the Eurybase reports on the education system of the countries concerned and from the publication *Key Data on Education in Europe* (European Commission, 2009).

Formal induction processes exist in Cyprus, France, Germany, Greece, Liechtenstein, the Netherlands, the United Kingdom (England and Scotland) and China. With the exception of Cyprus, where induction and mentoring has been offered to new teachers only since October 2008, the vast majority of teachers new to the profession in all these countries participate in a formal induction and mentoring process (Table 6.37). In Cyprus, from October 2008 to May 2009, 45% of teachers new to the profession participated in induction.

In England newly qualified teachers are required to meet national standards (core standards) by the end of their induction period. Otherwise, they are not eligible for employment as a teacher in a publicly funded school. In Scotland, all newly qualified teachers who wish to work in publicly funded schools are required to complete a period of induction as well before being awarded full registration as

a teacher. In China teachers new to the profession should take at least 120 hours of training. In Greece the induction period has three parts: the first lasts 60 hours, the second 35 hours and the third 5 hours. During the first and second parts of the induction programme, teachers get leave of absence or permission to attend the induction programme. The third part covers assessment issues.

In Liechtenstein, where the majority of teachers are trained abroad, the Office of Education or an institution appointed by the government conducts professional development courses for new teachers. The training programmes consist of blocks of 10-15 days duration and cover a wide variety of relevant topics.

In the Czech Republic, induction and mentoring programmes do not yet formally exist, and the form of induction depends on the school head. However, employers are required by the Labour Code to provide new teachers with an introduction to the job for up to two years after completing initial teacher training.

In Cyprus, England, Scotland, the Netherlands and China, teachers new to the profession usually also benefit from a mentoring programme (Table 6.37). This is also the case in France where secondary schools receiving new teachers are expected to create an environment of support and carry out a training process in partnership with universities and integrated teachers' training institutes (IUFM).

Other measures of support to new teachers include maximum class time for new teachers (England, Scotland and the Netherlands), additional support from other agents (Cyprus) and additional funding or training for the mentor (Scotland and Cyprus, respectively). For the latter, in Scotland, 0.1 full-time equivalent (FTE) funding per newly qualified teacher is allocated to local authorities for the provision of a mentor. Teachers in Cyprus attend special training programmes offered by the Cyprus Pedagogical Institute. In addition to the mentor, new teachers in Cyprus are supported by teacher trainers from the Cyprus Pedagogical Institute.

In Scotland the maximum class time of teachers in the induction scheme is 70% of that of a full-time teacher, in the Netherlands it is 80% from 1 August 2009 and

in England the head teacher has to ensure that a teacher taking part in induction does not teach more than 90% of the time. New teachers in Cyprus and the Czech Republic do not have a reduced teaching load.

Summing up

The coverage of the thirteen countries that did not participate in the TALIS survey is fair overall. As expected there was only a partial match between the data areas covered in TALIS and the data that could be obtained from these countries. Some quantitative information was available on the types of professional development teacher participated in, the need for professional development, and reasons for not participating. More limited quantitative information was available on actual participation, experienced impact of different types of professional development, and on induction and mentoring programmes. No quantitative information was available on support for professional development (Table 6.32).

With respect to participation, quantitative information was available for relatively few countries and was not summarised in a table, because of low comparability with the information collected for TALIS. The TALIS survey asked about participation over a fixed period of time (the previous 18 months).

The percentages of teachers taking part in specific types of professional development activities in these countries generally correspond to the average in the EU TALIS countries, England being the exception. It is striking that a substantially larger proportion of English teachers participate in a professional development network, individual and collaborative research, mentoring and peer tutoring, and reading professional literature. This is confirmed by the British share in professional literature on continuous professional development, suggesting that the kind of professional development linked to support for a broader scope for teachers' professional roles is further developed in the United Kingdom than in other European countries.

The experienced impact of professional development activities between EU TALIS countries and non-participating countries was also difficult to compare, as the figures available from France, Greece and Swe-

den have other references for the professional development activities undertaken. One observation that might be made is that the impact figures for Greece and Sweden (about 84% and 67%, respectively) are rather near the EU TALIS (about 80%) average, as are the impact figures for the Netherlands (subgroup of Dutch teachers who completed the TALIS survey) The impact figures for specific courses taken in France are considerably lower (of the order of 20% to 30%).

Barriers experienced with respect to participation in professional activities are considerably lower in some of the non-participating countries for which data are available. France and England have only some 10% of teachers experiencing certain barriers, as compared to the EU TALIS average of about 40%. On the other hand, the percentage of teachers in Cyprus, Germany and Greece who reported conflict with work schedule as a reason for not undertaking professional development was 12 to 23 percentage points higher than the EU average of 43.1%. In Germany and the Netherlands the lack of suitable professional development was reported more frequently as a reason for not undertaking more professional development as well (67.0% in Germany and 50.3% in the Netherlands compared to the EU TALIS average of 44.9%). In the Netherlands this is also the case for lack of employer support and family responsibilities. However, Dutch teachers experience fewer barriers with regard to lack of suitable professional development (15% lower than the EU TALIS average of 44.9%)

Unmet need for professional development activities was generally much higher in Cyprus, England and China than the EU average (with differences of the order of 40-50% compared to an EU average of about 15%).

With respect to induction and mentoring, England stands out again as a country in which this is well established, with clear career implication for the beginning teachers concerned.

All in all the review of non-participating countries suggests that expanding the number of countries participating in the TALIS study would enlarge between-country variability. This would enhance the policy relevance, as between-country differences are the most important sources of learning from international surveys.

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Table 6.32: Availability of data for selected areas of teachers' professional development and induction and mentoring in countries that did not participate in TALIS

Countries	Areas in TALIS											
	Participation of teachers in CPD			Types of CPD undertaken by teachers			Impact of different types of CPD	Support for CPD	Reasons for not participating in more CPD	CPD needs	Induction	Mentoring
	% of teachers that undertook CPD	Average days of CPD across all teachers	Average days of CPD among those who participated in CPD	%	m	m	m	m	%	%	%	%
Cyprus	m	m	m	%	m	m	m	m	%	%	*	*
Czech Republic	%	m	m	m	m	m	m	m	*	*	*	m
Finland	%	%	%	m	m	m	m	m	m	m	m	*
France	%	*	m	%	m	%	%	m	m	m	*	m
Germany	m	*	m	*	m	*	*	m	%	m	m	m
Greece	m	m	m	m	m	%	%	m	%	%	m	m
Liechtenstein	m	m	m	m	m	m	m	m	m	*	m	m
Netherlands	%	*	m	%	%	%	%	%	%	%	%	%
Sweden	*	m	m	*	m	%	%	m	*	m	m	m
Switzerland	m	*	m	m	m	m	m	m	m	m	m	m
United Kingdom (England)	m	m	m	%	m	m	m	m	%	%	%	%
United Kingdom (Scotland)	*	m	m	m	m	m	m	m	m	m	*	*
China (Beijing)	m	m	m	%	m	m	m	m	%	%	*	%

CPD = continuous professional development.
 % = data in percentages available.
 * = data available, but percentages are missing.
 m = data is not available.

Notes:

Czech Republic In the report of the Czech Inspectorate the percentage of teachers that undertook CPD is reported for each of the 14 regions. An estimate at national level of the proportion of teachers that undertook CPD is missing.

Table 6.33: Types of professional development undertaken by teachers (data sources and period of reference vary)

Percentages of teachers undertaking specified professional development activities

Countries	TALIS										Other
	Courses and workshops	Education conferences and seminars	Qualification programmes	Observation visits to other schools	Professional development network	Individual and collaborative research	Monitoring and peer observation	Reading professional literature	Informal dialogue to improve teaching		
Cyprus	m	41.8 (Inspectorate) 41.4 (CPI optional) 6.3 (CPI other) 40.9 (Conferences Ministry) 21.0 (Conferences abroad)	9.7 (post-graduate) 1.3 (graduate)	m	m	m	m	m	m		
Czech Republic	m	m	m	m	m	m	m	m	m		
Finland	m	m	m	m	m	m	m	m	m		
France	70.0 (CPD course) 13.0 (associations)	m	19.0	m	m	m	91.0	m	m	See notes	
Germany	*	*	*	*	*	*	*	*	*		
Greece	m	m	m	m	m	m	m	m	m		
Liechtenstein	m	m	m	m	m	m	m	m	m		
Netherlands	86.7	50.8	30.4	24.8	25.8	44.0	84.4	94.1	m		
Sweden	*	m	m	m	m	m	m	m	m		
Switzerland	m	m	m	m	m	m	m	m	m		
United Kingdom (England)	89.6 (school) 78.2 (external) 40.7 (other sectors)	m	m	m	60.0	50.9 (inquiry) 26.8 (re-search)	78.4	m	m	See notes	
United Kingdom (Scotland)	m	m	*	m	m	m	m	m	m		
EU (TALIS) average	81.4	48.4	24.8	23.5	37.7	34.5	80.9	92.4			
China (Beijing)	69.7 (new curriculum, NCR) 83.2 (credits, CEEC) 21.7 (backbone teachers)	m	5.1 (bachelor) 2.8 (educational master degree) 20.0 (master's certificate class)	m	m	m	m	m	m	See notes	
TALIS average	81.2	48.9	24.5	27.6	40.0	35.4	77.7	92.6			

* = types of professional development undertaken reported, percentages of teachers undertaking specified activities missing.
m = data is not available.
CPI = Cyprus Pedagogical Institute.

Notes:

Cyprus	<p><i>Education conferences</i> include: Inspectorate seminars (48.1%), CPI optional seminars 41.4%), CPI other seminars (6.3%), conferences ministry (40.9%), conferences abroad (21.0%)</p> <p><i>Qualification programmes</i>: Postgraduate programmes (9.7%), graduate programmes (1.3%)</p> <p>Reference period is school year 2007/08. Data refer to sample of primary and secondary teachers.</p>
England	<p><i>Courses and workshops</i>: courses in school held on INSET days (89.6%), external courses (78.2%), training with professionals from other sectors (40.7%).</p> <p><i>Professional development network</i>: collaborative learning within a network of schools (60.0%).</p> <p><i>Individual and collaborative research</i>: participating in collaborative enquiry (50.9%), undertaking classroom or school based research (26.8).</p> <p><i>Monitoring and peer observation</i>: observing colleagues teach (70.0), being observed by colleagues (82.7%).</p> <p><i>Reading professional literature</i>: development/learning individually (78.4%).</p> <p><i>Other</i>: being a mentor or coach (57.4%), being supported by a mentor or coach (37.9%), collaborative learning with colleagues in my own school (81.5%), taking active part in school self-evaluation ((83.0%), engaging with subject or specialist organisations (61.1%), sabbatical (1.8%).</p> <p>Reference period is 2006 (12 months prior to the survey). Data refer to sample of primary and secondary teachers.</p>
France	<p><i>Courses</i>: CPD courses (70%), courses proposed through a "cadre associatif" [professional association] (13%).</p> <p><i>Qualification programs</i>: university study (19%).</p> <p><i>Other</i>: software in the field of study or online resources (56%), self-study (87%).</p> <p>Data refer to sample of 1 101 secondary teachers, reference period is 2002/03, 2003/04, 2004/05.</p>
Germany	<p>Data refer to teachers who completed online GEW survey, reference period is 2007-08 (18 months prior to the survey).</p>
Netherlands	<p>Data refer to 657 lower secondary teachers who completed the TALIS questionnaire</p>
Sweden	<p><i>Courses</i>: courses organised by the Swedish National Agency for Education under "Boost for teacher's initiative".</p>
China	<p><i>Courses</i>: New Curriculum Reform Training (69.7%), Credit Hours in Continuing Education (83.2%), Back-bone Teachers' Training (21.7%).</p> <p><i>Degree programmes</i>: Bachelor's degree (5.1%), educational master's degree (2.8%), master's degree (2.8%), master's certificate class (20.0 %).</p> <p><i>Other</i>: Teacher Research Group activities (86.1%).</p> <p>Data refer to sample of 2 017 lower secondary teachers; reference period is 2004-07.</p>

Table 6.34 Impact of professional development undertaken by teachers upon their development as a teacher (data sources and period of reference vary)

Percentage of teachers reporting that the professional development (PD) undertaken had an impact upon their development as teacher

	TALIS	Other impact
	Impact upon development as teacher	
Countries		
Cyprus	m	
Czech Republic	m	
Finland	m	
France	m	37.0 (Exchange about educational practices) 17.0 (Improvement of classroom practices) 17.0 (Enhancement of the pedagogical culture) 12.0 (Better use of ICT)
Germany	*	
Greece	48.0 (Great impact of PD) 36.0 (Sufficient impact) 9.0 (Little impact) 5.0 (No impact)	
Liechtenstein	m	
Netherlands	74.5 (Courses and workshops) 62.5 (Education conferences and seminars) 94.3 (Qualification programmes) 76.0 (observation visits to other schools) 79.2 (Professional development network) 91.8 (Individual and collaborative research) 84.3 (Mentoring and peer observation) 80.3 (Reading professional literature) 89.8 (Informal dialogue to improve teaching)	
Sweden	68.8 (Knowledge) 66.7 (Skills)	
Switzerland	m	
United Kingdom (England)	m	
United Kingdom (Scotland)	m	
China (Beijing)	m	

* = impact reported, percentages of teachers reporting impact missing.

m = data is not available.

Notes:

Cyprus	Data available on expected impact, not on the experienced impact.
France	Other impact: impact is measured as the impact of the last course on continuous professional development followed. Data refer to sample of 1 101 secondary teachers (reference period is 2002/03, 2003/04, 2004/05)
Greece	48% of the teachers reported that PD activities had a great impact. 36% of the teachers reported that PD activities had a sufficient impact. 9% of the teachers reported that PD activities had little impact. 5% of the teachers reported that PD activities had no impact. Reference period is 2006-08, data for a sample of 4 000 primary and secondary teachers.
Netherlands	Data refer to 657 lower secondary teachers who completed the TALIS questionnaire. Data concern the percentage of teachers reporting that the professional development undertaken in the 18 months had a moderate or high impact upon their development as a teacher by type of professional development undertaken. Courses and workshops (74.5%). Education conferences and seminars (62.5%). Qualification programmes (94.3%). Observation visits to other schools (76.0%). Professional development network (79.2%). Individual and collaborative research (91.8%). Mentoring and peer observation (84.3%). Reading professional literature (80.3%). Informal dialogue to improve teaching (89.8%).
Sweden	Impact upon development as teacher: additional subject knowledge (68.8%), additional teaching skills (66.7%). Data refer to survey of 519 teachers who participated in courses related to the "Boost for teachers" initiative organised by the Swedish National Agency for Education (Reference period is 2007 and 2008)

Table 6.35 Reasons for not participating in more professional development (data sources and period of reference vary)

Percentage of teachers mentioning the following barriers for not undertaking (more) professional development

TALIS						Other	
	Did not have the prerequisites	Too expensive	Lack of employer support	Conflict with work schedule	Family responsibilities	No suitable professional development	
Cyprus	m	m	m	68.6	m	m	41.1 Lack of information about CPD 32.7 Place of CPD activity 34.2 Unsatisfactory level
Czech Republic	m	*	m	*	m	m	* Difficulties with transport from smaller communities
Finland	m	m	m	m	m	m	19.0 Not judged useful to undertake CPD 11.0 Preparation of pupils for exam 8.0 Absence of supply 7.0 Personal reasons
France	m	m	m	6.0	m	11.0	
Germany	4.0	30.0	15.0	55.0	29.0	67.0	39.0 Insufficient information 36.0 Limited number of teachers accepted 3.0 Other reasons 21.0 Did not face any problem
Greece	m	36.0	11.0 (x) (difficulties school)	11.0 (x) (difficulties school) 57.0 (lack of time)	m	m	
Liechtenstein	m	m	m	m	m	m	
Netherlands	9.0	24.3	29.7	50.3	35.3	30.3	
Sweden	m	m	m	m	m	m	
Switzerland	m	m	m	m	m	m	
United Kingdom (England)	m	19.0	10.0	11.0	m	m	10.0 Not offered opportunity to attend sessions
United Kingdom (Scotland)	m	m	m	m	m	m	
EU (TALIS average)	5.2	27.8	13.7	43.1	30.2	44.9	
China (Beijing)	m	m	m	44.3 (workload) 34.4 (schedule)	14.0	49.9 (training content)	
TALIS average	7.1	28.4	15.0	46.7	30.1	42.3	

* = reasons reported, percentages of teachers mentioning the reasons missing.

x = data are included in more columns, i.e. data are not available for certain sub-categories and can only be provided for more categories (see also the country notes).

m = data is not available.

Notes:

Cyprus	The data refer to the percentage of teachers who reported that the factor is an obstacle for participation in (more) professional development to a high or very high degree.
Czech Republic	<i>Too expensive</i> : lack of financial resources. <i>Family responsibilities</i> : family problems (14.0%). Reference period is 2007/08 school year.
England	<i>Too expensive</i> : lack of funding (19%). <i>Conflict with work schedule</i> : lack of time to attend (11%). <i>Other</i> : not offered the opportunity to attend sessions (10%). Reference period is 2006, data refer to sample of primary and secondary teachers.
France	<i>Conflict with work schedule</i> : No replacement. <i>No suitable professional development</i> : No interesting or suitable CPD (11%). <i>Other</i> : Not judged useful to undertake CPD (19%), preparation of pupils for exams (11%), absence of supply (10%), personal reasons (7%). Data refer to sample of 1 101 secondary teachers (reference period is 2002/03, 2003/04, 2004/05).
Germany	Data refer to teachers who completed GEW online survey, reference period is 2007-08 (18 months prior to the survey).
Greece	<i>Too expensive</i> : financial problems (36%). <i>Conflict with work schedule/lack of employer support</i> : difficulties with school/service (11%). <i>Conflict with work schedule</i> : Lack of time to attend (57%). <i>Other</i> : insufficient information (39%), limited number of teachers accepted (36%), other reasons (3%), did not face any problem (21%). Reference period is 2006-08, data refer to sample of 4 000 primary and secondary teachers.
Netherlands	Data refer to 657 lower secondary teachers completed the TALIS questionnaire.
China	<i>No suitable professional development</i> : training content not related to teaching (49.9%). <i>Conflict with work schedule</i> : heavy workload (44.3%), scheduling conflicts (34.4%). <i>Other</i> : no feedback after training (39.7%), instructors with insufficient skills (27.5%), instructors using wrong pedagogy (22.5%) and fragmented training content (21.8%). Data refer to sample of 2 017 lower secondary teachers; reference period is 2004-07.

Table 6.36 Teachers' professional development needs (data sources and period of reference vary)

Percentage of teachers indicating need for professional development in the following areas

	TALIS										Other	
	Content and performance standards	Student assessment practices	Classroom management	Subject field	Instructional practices	ICT teaching skills	Teaching special learning needs students	Student discipline and behaviour problems	School management and administration	Teaching in a multicultural setting		Student counselling
Cyprus	m	31.5	m	m	43.8	m	33.9 (difficulties) 13.7 (inclusive)	56.2	33.9	34.1	m	See notes
Czech Republic	m	m	m	*	m	*	m	m	m	m	m	*
Finland	m	m	m	m	m	m	m	m	m	m	m	
France	m	m	m	m	m	m	m	m	m	m	m	
Greece	43.0	23.0	77.0 (x)	35.0	60.0	53.0	77.0 (x)	77.0 (x)	77.0 (x)	77.0 (x)	m	(x) see notes
Germany	m	m	m	m	m	m	m	*	m	m	m	
Liechtenstein	m	m	m	m	m	m	m	m	m	m	m	
Netherlands	22.2	15.7	16.6	25.3	24.0	27.0	26.0	20.6	6.0	5.4	30.4	
Sweden	m	m	m	m	m	m	m	m	m	m	m	
Switzerland	m	m	m	m	m	m	m	m	m	m	m	
United Kingdom (England)	38.2	42.6	m	51.7 (curriculum subjects) 30.1 (literacy) 25.8 (numeracy)	m	58.7	46.2 (special needs) 45.4 (gifted pupils) 46.3 (underachievement)	36.8 (social development) 36.1 (behaviour management)	31.2 (support staff) 26.1 (professionals)	15.9	m	See notes
United Kingdom (Scotland)	m	m	m	m	m	m	m	m	m	m	m	
EU (TALIS) average	14.4	13.8	12.1	15.7	16.1	24.5	31.4	20.8	8.1	12.4	14.9	
China (Beijing)	m	m	42.5	47.3 (subject matter) 37.6 (common knowledge)	50.3 (teaching strategies) 39.5 (new concepts) 65.8 (teacher models)	40.9	m	m	m	m	m	See notes
TALIS average	16.0	15.7	13.3	17.0	17.1	24.7	31.3	21.4	9.7	13.9	16.7	

* = needs are reported, percentages of teachers reporting the needs missing.

x = the data are included in several columns. For Greece the data on school and classroom management cover more categories (see also the country notes).

m = data is not available.

Notes:

- Cyprus *Instructional practices*: differentiation in teaching – mixed ability classes (43.8%).
ICT teaching skills: ICT in education (42.2%).
Teaching special learning needs students: learning difficulties (33.9%), inclusive education (13.7).
Teaching in a multicultural setting: Intercultural education (34.1%)
Other areas of high needs: civic education (36.2%), curriculum development at school level (37.3%) and educational psychology (42.8%).
Reference period is 2007/08, data refer to sample of primary and secondary teachers.
- Czech Republic *Subject field*: language education.
Other: developing school education programmes, innovation in educational content.
Reference period is 2007/08, data refer to sample of pre-primary, primary and secondary teachers.
- England *Content and performance standards*: target setting for individual pupils (38.2%).
Student assessment practices: assessment for learning (42.6%).
Subject field: strengthening and/or updating skills and knowledge in curriculum subject areas (51.7%), supporting pupils' literacy (30.1%), supporting pupils' numeracy (25.8%).
ICT teaching skills: using ICT in teaching (58.7%).
Teaching special learning needs students: teaching pupils with special education needs (46.2%), teaching gifted and talented pupils (45.4%), addressing underachievement in groups of pupils (46.3%).
Student discipline and behaviour problems: promoting social and emotional development in pupils (36.8%), behaviour management (36.1%).
School management and administration: working with and/or managing support staff (31.2%), working with other professionals in school (26.1%).
Teaching in a multicultural setting: meeting the needs of ethnic minority students (15.9%).
Other: personalised learning (36.6%), teaching pupils with English as an additional language (18.0%), teaching citizenship (24.2%), school self-evaluation (29.3%).
Reference period is 2006, data refer to sample of primary and secondary teachers.
- Germany Data refer to teachers who completed GEW online survey, reference period is 2007-08 (18 months prior to the survey).
- Greece *School and classroom management*: classroom management, school management and administration, student discipline and behaviour problems, conflict management, teaching in a multicultural setting, teaching mixed-ability classes, etc. (77%).
Instructional practices: pedagogical and methodological approaches, teaching methodology, experiential learning, group work, projects, etc. (60%).
ICT teaching skills: Using ICT in teaching (53%).
Content and performance standards: curricula, lesson planning, organisation of activities (43%).
Subject field: strengthening and/or updating skills and knowledge in subject areas (35%).
Assessment: student assessment practices, evaluation of pedagogical activities (*i.e.* teachers' practices, materials, books, curriculum), school evaluation (23%).
Reference period is 2006-08, data refer to sample of 4 000 primary and secondary teachers.
- Netherlands Data refer to 657 lower secondary teachers who completed the TALIS questionnaire, reference period is 2007-208 (18 months prior to the survey). Data concern the percentage of these teachers reporting having a high level of need for professional development in the areas.
- China *Classroom management*: classroom management strategies (42.5%).
Subject field: new subject matter knowledge (47.3%), common knowledge (37.6%).
Instructional practices: pedagogy (teaching strategies) (50.3%), new concepts and theories in teaching and learning (39.5%), learning from model teachers (65.8).
ICT teaching skills: multimedia teaching technology strategies (40.9%).
Other: educational research methodologies (38.2%).
Data refer to sample of 2 017 lower secondary teachers; reference period is 2004-07.

Table 6.37 Existence of mentoring and induction programmes for new teachers in countries that did not participate in TALIS (data sources and period of reference vary)

Percentage of teachers who participated in induction process and mentoring programmes for teachers new to the school

	TALIS						Other		
	Existence of formal induction process or policies (% of teachers who participated)			Existence of mentoring programme or policy in school (% of teachers who had access)			Support that teachers receive during induction		
	Induction process for all teachers new to the school	Induction process only for those in their first teaching job	No formal induction process	Yes, for all teachers new to the school	Yes but only for those in their first teaching job	No formal mentoring process	Reduced timetable	Support from other agents	Additional funding or training for mentor
Countries									
Cyprus		Yes (45%, approximately)			Yes		No	Yes	Yes
Czech Republic			No*			No*	No		
Finland	m	m	m	m	m	m			
France		Yes ¹			Yes				
Germany		Yes ¹		m	m	m			
Greece		Yes (100%)		m	m	m			
Liechtenstein	m	m	m	m	m	m			
Netherlands		Yes			Yes		Yes, max 80%*		
Sweden	m	m	m	m	m	m			
Switzerland	m	m	m	m	m	m			
UK (England)		Yes (88%)			Yes		Yes, max 90%		
UK (Scotland)		Yes			Yes		Yes, max 70%		0.1 FTE for mentor
China (Beijing)		Yes			Yes (91.8%)				

% = data in percentages available.

* = existence of mentoring or induction are reported, but percentage of teachers that participated is missing.

m = data is not available.

FTE = full-time equivalent.

1. According to figure D22: "Final on the job qualifying phase for pre-primary, primary and secondary education" (ISCED 0, 1, 2 and 3, 2006/07) published in *Key Data on Education in Europe* (European Commission (2009)).

Notes:

Cyprus Mentoring programme: 90% of teachers had a mentor of the same subject specialisation.

Other: Reference period is October 2008-May 2009. Data refer to secondary school teachers.

Czech Republic School head is responsible for form of induction: mentoring programme could be part of induction.

England Data refer to new qualified primary and secondary teachers in their first year in job. Reference period is 2004/05

France Data source: European Commission (2009). *Key Data on Education in Europe*.

Germany Data source: European Commission (2009). *Key Data on Education in Europe*.

Greece As from 2000, induction has been obligatory for all newly appointed teachers in primary and secondary education.

Netherlands *From 1 August 2009.

Executive summary and main conclusions

The Teaching and Learning International Survey (TALIS) conducted by the OECD in 2007-08, has yielded a first¹ database on the working conditions of teachers at the lower secondary level and the learning environment of their schools. This report draws on the TALIS database to analyse teachers' professional development. The theme of teachers' professional development is emphasised by the Education Council in Council conclusions of 2005 and 2007 as part of wider framework of 16 core indicators for measuring progress towards the Lisbon Objectives in Education and Training.

As Chapter 1 explains, TALIS addresses themes that are directly relevant to the European Union's concern to further the quality and equity of education in Member States. The professional development of teachers is considered an important means of attaining this objective. EU policies in the area of professional development are inspired by analyses of the need to modernise teachers' initial education and continuous professional development, which stems from ongoing changes in the environment of education and training systems. These include the greater heterogeneity of student populations, teaching philosophies that emphasise independent learning, and the increased responsibilities of teachers as schools in many countries become more autonomous.

Policies regarding initial teacher education and continuous professional development are driven by research indicating the importance of teacher quality for improving student outcomes. EU Member States are responsible for the quality of their education and training systems, but the European Union stimulates and supports policies on teachers' professional development with the following aim:

- providing a *continuum of teacher education* to ensure the co-ordination of teachers' initial training, early career support and further professional development;
- stimulating *professional values* that encourage teachers to be reflective practitioners and innovative;
- making teaching an *attractive profession*, among others by means of recruitment, placement, retention and mobility policies;
- ensuring that teachers hold a *qualification* from a higher education institution that balances research-based studies and teaching practice;
- supporting teachers by offering *effective early career support and continuous formal and informal learning opportunities*;
- offering *high quality teacher education and continuous professional development* by supporting

¹ It is a first database, because more rounds of TALIS covering other levels of education are intended in the future.

professional development programmes and ensuring that teacher education institutions offer programmes that meet the evolving needs of schools, teachers and society at large;

- by offering opportunities for *school leadership*.

In more operational terms the EU's Education and Training 2020 Work Programme directly stimulates exchange of information, data and good practice through mutual learning and peer review.

In this ambitious context, the TALIS database helps to describe the state of play with respect to teachers' professional development in 18 EU, candidate and EEA countries, as well as in 5 countries outside the EU and aligned countries.

Chapter 2 takes a closer look at the research on teacher effectiveness. The performance-oriented perspective taken in this chapter is in line with the European Union's policy objective regarding professional development described in the previous chapter: to design teachers' professional development in such a way that the quality of teaching is enhanced and can, in turn, raise student achievement.

The chapter shows that the research evidence underlines the importance of overall teaching quality as a lever for improving student achievement. Yet, when it comes to specifying precisely which teacher and teaching characteristics determine teaching quality, there are many candidates. In the realm of teacher effectiveness (*i.e.* effectiveness that is due to specific characteristics and attributes of individual teachers), the chapter looks at formal qualifications and experience, knowledge of the subject matter, knowledge about teaching and learning, pedagogical content knowledge, teaching styles and competencies, and teacher beliefs. On most of these characteristics, the research evidence is rather mixed, often presents contradictory findings and, on average, shows relatively small effect sizes. Three of the teacher characteristics deserve particular attention. The first is pedagogical content knowledge, a very promising source of teacher competence which integrates knowledge of the subject matter and knowing how to teach it.

The second concerns teacher preference for either a more direct, structured approach to teaching or a constructivist approach. These two teaching philosophies are central to educational discourse and are often seen as competing. A less radical view might consider them as different teaching styles, to be adopted as the teaching context (phase of presentation of the subject matter, type of students, etc.) requires. Third, the concept of teachers' sense of self-efficacy is an interesting factor. Most studies have found a positive relationship between teachers' beliefs about their efficacy and student achievements in core academic outcomes. The concept underlines the importance of motivation in teachers' work.

In the area of teaching effectiveness (*i.e.* effectiveness that is due to specific ways of teaching), the distinction between constructivist and direct teaching strategies reappears. Research reviews and meta-analyses seem to indicate that both teaching approaches are important and deserve to be part of teachers' teaching repertoires. Important as well are curricular offerings, particularly the need to provide a good match between what is taught and assessed in achievement tests and examinations (opportunity to learn), learning time, and a positive classroom climate. The potential of formative and summative assessment and of performance feedback is increasingly emphasised and supported by research evidence as well.

Research evidence on teacher and teaching effectiveness shows which areas are important for teachers' professional development and the content of development programmes, both for initial teacher education and for continuous professional development.

Regarding teachers' professional development, the chapter draws attention to two important dimensions. The first is the distinction, also made in EU policy documents, between initial teacher education and "further" training, in the sense of early career support or induction programmes, in-service training, and continuous professional development that is not limited to specific courses and training environments but also involves thoughtful reflection on teachers' everyday practice.

The second dimension concerns the content of professional development. The basic idea is that teachers' professional development should improve teaching quality, which in turn should enhance student achievement. Hence, teacher and teaching effectiveness research is relevant to determining which teacher characteristics and teaching factors to focus on. Additional "content" is introduced for the professional development that is more or less integrated in everyday school practice and envisages a broader spectrum of teachers' functions, which emphasises their role as members of modern professional organisations along with their teaching role. Here, concepts such as the "reflective practitioner" or the "school as a learning organisation" are frequently mentioned and teachers' roles in "secondary" processes are emphasised. This additional emphasis on secondary roles is also promoted as part of the modernisation of the teaching profession. They include teachers as researchers, as receivers of feedback from colleagues, as innovators, as active colleagues, as collaborators of principals, and as manifesting what is sometimes called "teacher leadership". The emphases in this dimension of teachers' professional development are very much in line with human relations management (HRM) and human relations development (HRD) approaches. This broader view of continuous professional development, which views teachers as members of professional learning communities, has also been studied for its effect on student achievement. As the chapter shows, the effects are not yet entirely clear. For the subject at hand, these two dimensions – professional development to stimulate the primary process of teaching and learning and professional development in terms of new secondary roles in schools – provide alternative scenarios for prioritising the content of continuous professional development.

The substance of the TALIS survey represents fairly well the aspects of teachers' professional development addressed in the research literature:

- central variables are teachers' participation in professional development activities and their perceived impact of these activities;
- a broad range of topics that are dealt with in professional development activities, some

closer to subject matter mastery and didactics, others closer to the skills addressed in the HRD/HRM approach to teachers' continuous professional development;

- preferred teaching strategies, as they may relate to teachers' experienced need for and barriers to professional development;
- relevant characteristics of the school context, both objective background characteristics, such as school size, and more "policy-rich" factors, such as those concerned with educational leadership and evaluation and review activities;
- finally, descriptive teacher background characteristics, such as age, gender and experience, which may be associated with their attitudes *vis-à-vis* professional development activities.

The empirical evidence from TALIS bearing on these topics is presented in subsequent chapters.

Chapter 3 reviews the research evidence available prior to the TALIS study on the amounts, types and impact of professional development. Comparative quantitative data on the professional development of teachers is scarce at both the national and international levels. Studies by Eurydice (2003 and 2008) and the European Commission (2009) indicate the formal status of professional development as a professional duty or as optional. In many countries and regions, professional development is considered a professional duty for teachers. Yet, teachers are not explicitly obliged to engage in professional development activities in all countries and regions (Figure 3.1). For example, while professional development is considered a professional duty in France, Iceland, the Netherlands and Sweden, participation is in fact optional. In Luxembourg, Poland, Portugal, Slovenia, Slovakia and Spain, continuous professional development is optional, but clearly linked to career advancement and salary increases. In Luxembourg and Spain, teachers who enrol for a certain amount of training are eligible for a salary bonus. In Cyprus, Greece and Italy professional development is a definite obligation for newly appointed teachers.

The OECD study *“Attracting, Developing, and Retaining Effective Teachers”* (OECD, 2005) provides some information on the minimum legal requirements for teachers’ participation in professional development in terms of time. In countries with minimum requirements – Australia (some states), Austria, Belgium (Fr.), Finland, Hungary, the Netherlands, Scotland, Sweden, Switzerland and the United States (some states) – the requirement is most commonly five days a year but ranges from 15 hours a year (Austria) to 104 hours in Sweden. The OECD study also provides information on countries reporting mandatory induction programmes for new teachers: Australia (some states); England, Wales and Northern Ireland; France; Greece; Israel; Italy; Japan; Korea; and Switzerland.

In the cited EU and OECD studies no data are available on the time teachers actually spent on professional development or on the perceived impact of professional development activities.

The OECD and EU studies yield very general information about the support teachers receive for professional development (such as possibilities for participating in professional development during working time). In Belgium, the Czech Republic, Finland, Italy, Lithuania, Luxembourg, Portugal, Slovenia, Romania and the United Kingdom, teachers have the right to use a certain amount of paid working time for professional development activities (Eurydice, 2008). However, owing to a lack of substitute teachers and the cost of providing substitute teachers, teachers often are not able to participate in professional development activities during working hours.

In none of the studies mentioned is information available on teachers’ perceived professional development needs. With the exception of the study, *Levels of Autonomy and Responsibilities of Teachers in Europe* (Eurydice, 2008) and *Key Data on Education in Europe* (European Commission, 2009), the data are not very recent and need to be updated. Clearly, even in terms of a basic description of the state of affairs of training and professional development of teachers in Europe, the TALIS survey fills gaps in the knowledge base.

Chapter 4 presents the descriptive results regarding teachers’ professional development that emerge from the TALIS data set. The presentation of structure and content covers the same ground as Chapter 3 of the OECD report (OECD, 2009), but includes some new analyses. The chapter reviews current patterns of participation in professional development activities by lower secondary education teachers and examines the extent to which teachers’ demand for professional development is being met, how this varies according to the types of support teachers received, and what they perceive as hindrances to engaging in more than they do. Finally, it analyses the types of activities that teachers reported as having had the greatest impact on their development as teachers. The chapter thus sets out to answer questions about the amount of teachers’ professional development, the extent to which it meets their needs, and how it could be improved.

This provides the framework for a reiteration of key results and a discussion of what can be learned.

How much does the amount and profile of teachers’ professional development vary within and among countries?

The chapter first examined patterns of participation in professional development reported by teachers.

Key results

- The level and intensity of participation in professional development varies considerably among countries. Nearly nine in ten teachers take part in some sort of activity, but since the definition of professional development is broadly drawn, the fact that in some countries up to one teacher in four receives none is a source of concern.
- The strongest relation found between non-participation in professional development and teacher characteristics is the qualification level: teachers with lower qualification levels show relatively higher levels of non-participation

than teachers with higher qualification levels. This pattern is consistent across almost all participating countries. The non-participation rate also varies significantly by gender (higher non-participation rates among male teachers) and age group (higher non-participation rates among the youngest and the oldest teachers).

- Intensity of professional development varies across countries more than participation, with Korea and Mexico seeing teachers participating on average for over 30 days in 18 months, twice the average rate (Table 4.2). Among EU countries, Bulgaria, Italy, Poland and Spain report teachers participating on average for about 26 days in 18 months, almost twice the average rate for participating EU countries (Table 4.2).
- Within-country variation in the intensity of professional development can be high and is greatest in Italy, Korea, Mexico, Poland and Spain; older teachers tend to receive less than the average, though the pattern by gender is more mixed (Table 4.2a).
- The types of development undertaken by teachers explain some of these variations. Countries in which a high percentage of teachers take part in “qualification programmes” or “individual and collaborative research” tend to have a higher average number of days of development. However, only a small minority of teachers participate in these activities. On the other hand, virtually all teachers engage in “informal dialogue to improve teaching” and the great majority attend some form of “courses and workshops” (Tables 4.2 and 4.3).
- There is a clear difference between western European countries and other countries with respect to the types of professional development undertaken by teachers. In particular, participation in “mentoring and peer observations”, “qualification programmes”, “reading professional literature” and “observational visits to other schools” is consistently lower in western European countries than in others (Table 4.3).

- The pattern of participation in types of professional development is more similar in western European than in eastern European countries (Figure 4.1).

Discussion

The high average participation in development activities among lower secondary teachers is unquestionably a positive message from the TALIS results. Nevertheless, the fact that an average of some 11% of teachers did not take part in any of the more structured forms of professional development in the 18 months prior to the survey may be a concern (Table 4.2).

On the other hand, even if not all teachers engage in more organised types of activities, it is reassuring that virtually all engage in informal dialogue with others to improve their teaching and that the vast majority read professional literature. However, some of the more collaborative forms of development are more evident in some countries than in others.

How best should unsatisfied demand for professional development be addressed?

The chapter examines the support mechanisms that are in place for teachers and also the barriers that teachers reported as preventing them from engaging in more professional development. The analysis also reveals how these relate to teachers’ participation and their desire for more professional development.

Key results

- The principal cause of unfulfilled demand, according to teachers, is conflict with their work schedule, but they also often cited lack of suitable development opportunities. Those who did not participate at all in professional development were most likely to cite the latter (Tables 4.11 and 4.11a). Teachers who reported a lack of suitable development opportunities spent much less time on professional development activities than other teachers (Table 4.6).

- The most effective types of development, according to teachers, are those in which they participate least – programmes leading to a qualification and, to a lesser degree, research activities. The most effective types of development are also those for which teachers are more likely to have had to pay the full or partial cost and devote the most time to (Table 4.8).

Discussion

The degree of unsatisfied demand reported by teachers is troubling and may suggest a mismatch between the support provided and teachers' development needs in terms of content and modes of delivery.

For modes of delivery, the evidence from TALIS is very revealing. It is striking that the activities that teachers report as most effective for their development are also those for which they are more likely to have had to pay full or partial cost and to which they devote the most time. This need not mean that the cost of all teachers' participation in qualification programmes and research should be fully paid for, but a better balance should perhaps be sought between who pays and who benefits.

The 42% of teachers (45% in the EU) who reported a lack of suitable professional development activities to satisfy their needs is an equally worrying finding (Table 4.11). It indicates that carefully comparing provision and support with development needs should be a priority in many participating countries.

To what extent is professional development of teachers associated with other school policies and practices?

In the first TALIS report (OECD, 2009) different aspects of the professional development of teachers are related to other school practices, namely teaching strategies, evaluation and feedback mechanisms, and school leadership.

Key results

- Professional development activities that take place at regular intervals and involve teachers in a rather stable social, collaborative context (*i.e.* networks or mentoring) have a significantly stronger association with teaching practices than regular workshops and courses.
- Student-oriented teaching practices and enhanced activities are more strongly associated with professional development than structuring practices.
- The first TALIS report (OECD, 2009, Table 5.6) shows that, in a number of countries, identified weaknesses were more often simply reported to teachers rather than followed up with development or training plans.
- In most TALIS countries leadership style is not related to the number of days of professional development or to teachers' satisfaction with the amount of professional development days they received.

Discussion

It should be emphasised that the associations mentioned in the list of key results represent correlation rather than causation. The reported results on the association of contexts of professional development and teaching practices seem to suggest that a stable collaborative context enhances implementation in actual teaching practice. Next, a teaching emphasis characterised as student-oriented and dedicated to enhanced activities (*e.g.* special projects) is found together with greater intensity (in terms of number of days) of professional development. This may be seen as an indication that more recently developed teaching approaches require more professional development support than more traditional forms of (structured) teaching.

The fact that results of evaluation and appraisal were less often followed up with initiatives for professional development than directly reported to teaching staff may indicate the need to make

professional development activities more readily available. This might be easier if professional development becomes more continuous and embedded in the routine functioning of the school as the ideal of the school as a learning organisation becomes more widespread.

The relatively loose coupling of leadership and participation in and satisfaction with professional development is a somewhat troubling finding, since stimulating professional development is generally seen as a key aspect of educational leadership. Findings like these underline the potential of school improvement practices that are integrated, rather than partial and fragmented.

Chapter 5 analyses a causal model with experienced impact of professional development as the dependent (*i.e.* effect) variable. As compared with Chapter 4, this methodology allows for analysing more complex patterns in which school and teacher background variables, as well as other school policies, are interrelated with respect to professional development. Specifically, the influence of school and teacher factors on teachers' participation in professional development activities and its perceived impact are analysed. In order to describe the relations between different variables, a model was developed and tested based on the TALIS data set. The model comprises six categories of variables, including need for and participation in professional development activities, school policy and climate, teacher practices and beliefs, school context characteristics, and teacher background variables. The influence of these different sets of variables on teachers' perception of the impact of professional development was tested. It was expected that teachers' need for and participation in professional development activities have direct effects on the perceived impact. Furthermore, it was assumed that school and teacher factors have direct and indirect effects via need and participation on perceived impact.

Path analysis identifies the relation between the variation and amount of professional development activities and the impact of professional development as experienced by teachers. When teachers participate in various professional learn-

ing activities and spend more days on professional development, they find that professional development has a greater impact on their work. These findings offer support for the importance of the duration and variety of professional development activities for teacher's professional development. For professional development to become effective for teachers' practice and improved student learning, teachers should spend a good deal of time in professional development and especially on different activities. Recent research stresses more and more the notion of duration as a key feature of professional development (Desimone, 2009). The findings of this study provide support for the argument that duration counts for teacher learning. However, variety appears to be an even more important variable in explaining perceived impact. This has important policy implications. Policy measures at different levels (government and school) to stimulate teachers' participation in professional development activities can contribute to changing teaching practices and, in turn, to improved student learning.

The findings also show that teachers who have greater professional development needs find that professional development has a stronger impact on their work. These findings indicate that teachers' motivation plays an important role in the impact of professional development on teachers' practice as perceived by teachers themselves. Research has shown that motivated teachers have a higher sense of self-efficacy, are more willing to experiment, are more open to learning and are more persistent (see Chapter 3). Although teachers' sense of self-efficacy was not included in the model, perceived need may be interpreted as an indicator of teacher motivation. As such, the findings give support to the view that teacher motivation plays an important role in fostering professional development.

A clear finding is that feedback, as part of school policy, is strongly linked to teachers' professional development and to its impact. In this study, feedback refers to the perceived consequences of feedback on changes in different aspects of teachers' work. There is ample evidence to show that supporting teachers in ways that help them to change different aspects of their work is important for

their motivation to learn, collaboration and commitment to change their practice. In research on professional learning communities, discussed in Chapter 3, feedback and support are considered fundamental for fostering teacher learning at the school level. The findings of this study support this view by showing the key role of feedback as part of school policy and highlight the importance of appraisal and feedback for both teachers and schools. Greater emphasis on appraisal and feedback could strengthen its benefits within schools. The results can be used to plan and structure the professional development of individual teachers. By emphasising teacher appraisal and feedback, policy makers, administrators and school leaders can contribute to the development of schools as organisations that foster continuous professional learning and sustained improvement.

The findings also show the important role of climate. Teachers who feel good about their job and in their school view the effects of their professional development more positively. By promoting a positive school climate and high levels of trust in schools, principals can create a supportive environment for teacher learning. The important role of school climate for teacher learning is in line with the role of school climate for changing teachers' practice and improved student learning that is found in research on school effectiveness and school improvement (see Chapter 3). Given the positive impact of feedback on teachers' professional development, strengthening the link between school climate and the evaluative framework in schools could lead most teachers to feel that changing teaching practices is not only an individual but also very much a collective enterprise. In turn, this can stimulate school-wide capacity for learning and improvement.

In contrast to the important role of school factors, the impact of teacher-related factors, including teaching practices and collaboration, on professional development appears to be smaller. One reason is that, in contrast to what was expected, teachers' instructional preferences and collaboration did not correlate significantly with perceived impact. The findings do suggest that there is a relation with the number of professional development activities in which teachers participated.

The role of constructivist teaching is an interesting one. The more teachers use instructional strategies based on constructivist approaches to teaching, the more they participated in different professional development activities, and the more they collaborate in different activities at their school. A possible explanation might be that constructivist teaching is a relatively new approach, as compared with more structured or traditional (direct instruction) teaching methods and that teachers have only recently started to change their classroom practice. Moreover, it is not easy to adopt a constructivist approach to teaching. It requires teachers to focus on the learning and thinking activities of students, gradually transfer control of the learning process from instructors to students, stimulate the development of students' mental models and take into account the learning orientation of students (see Chapter 3). It often takes years to master a new way of teaching effectively that can positively affect student learning and motivation. Changing teaching in this direction thus requires a lot of training and opportunities for teachers to work together to solve problems, to provide feedback and information, and to assist and support. This may explain the association found between constructivist teaching, on the one hand, and the number of professional development activities and amount of collaboration, on the other. The literature offer much evidence to show that teachers' collaboration has strong positive effects on their professional learning and can, if focused on student learning, help to improve classroom practices. The relation between collaboration and the number of professional development activities in which teachers participate corroborates these findings.

Finally, teacher background variables and school context characteristics (antecedent variables), showed a significant but small correlation with other variables in the model. Despite the weak associations, differences were detected in the role played by teacher background variables and school context characteristics in promoting teachers' professional development. Teacher background variables appeared to be important for the amount and variety of the professional development activities teachers participate in. School context characteristics instead mainly function

as malleable factors for school policy and climate. Further research is needed to examine the joint effects of conditional and malleable factors at both the teacher and school level. Analysing these joint effects can increase our understanding of the effect of interactions between conditional and malleable factors on the amount, level and impact of teachers' professional development.

Chapter 6 presents evidence on the professional development of teachers in countries that did not participate in the TALIS survey. It covers 12 non-participating countries (for the United Kingdom data are reported separately for England and Scotland). The evidence for the Netherlands includes both data from TALIS and other data; while the Netherlands participated in TALIS, it did not meet the sampling requirements agreed by the TALIS Board of participating countries. Because the Dutch TALIS data are not representative of all Dutch teachers, the Netherlands is included in Chapter 6.

As expected, there was only a partial match between the areas covered in TALIS and the data that could be obtained from the non-participating countries. Some quantitative information was available on the types of professional development that teachers participate in, on the need for professional development, and on reasons for not participating. More limited quantitative information was available on actual participation, the perceived impact of different types of professional development, and on induction and mentoring programmes. Except for the Netherlands, no quantitative information was available on support for professional development (Table 6.32).

With respect to participation, quantitative information was available for relatively few countries and was not summarised in a table, because of the low degree of comparability with the information collected for TALIS. The TALIS survey asked about participation over a fixed period of time (the previous 18 months).

The percentages of teachers taking part in specific types of professional development activities in non-participating countries generally correspond to the average in the EU TALIS countries. England is an

exception, as a substantially larger proportion of English teachers undertake activities such as participation in a professional development network, individual and collaborative research, mentoring and peer tutoring, and reading professional literature. This finding is reflected in its share of professional literature on continuous professional development, suggesting that the kind of professional development that is connected to support for a broader scope of professional roles for teachers is further developed in the United Kingdom than in other European countries.

It was also difficult to compare the experienced impact of professional development activities between EU TALIS countries and non-participating countries, as the available figures (for France, Greece and Sweden) have other references in terms of the professional development activities undertaken. The impact figures for Sweden (about 67%) are relatively near the EU TALIS average (about 80%); the impact figures for specific courses in France and Greece are considerably lower (of the order of 20% to 30% and 50%, respectively). In the Netherlands, teachers who completed the TALIS questionnaire reported that qualification programmes and individual and collaborative research activities were the most effective types of professional development (with impact scores just above the EU TALIS average), while education conferences and seminars were seen as the least effective (with impact score 10% below the TALIS average).

Barriers to participation in professional activities are considerably lower in some non-participating countries for which data are available. In France and England some 10% of teachers experienced barriers such as "lack of employer support", "conflict with work schedule" and "no suitable professional development", compared to the EU TALIS average of about 40% for specific types of barriers. However, in Cyprus, Germany and Greece, "conflict with work schedule" was reported more frequently than the TALIS average. The same is true of "lack of employer support" (the Netherlands, 15% above the TALIS average) and "no suitable professional development" (Germany, 20% above the TALIS average). In the Netherlands, this barrier was 15% below the TALIS average.

Unmet need for professional development activities was generally higher than the EU average in China, Cyprus, England, Greece and the Netherlands (differences of the order of 30-50% of teachers experiencing such needs in these countries against an EU TALIS average of about 15%). The aspects of the teaching and learning process for which sizeable proportions of teachers in the countries mentioned above reported development needs are “subject fields”, “instructional practices”, “ICT teaching skills” and “teaching special learning needs students”. With respect to induction and mentoring, England stands out as a country in which this is well established, with clear career implication for the beginning teachers concerned.

All in all, the review of non-participating countries suggests that expanding the number of participating countries in the TALIS study would enlarge between-country variability. This in turn would enhance its policy relevance, as between-country differences are the most important sources of learning from international surveys.

Issues for further reflection

The EU outlook on teachers' professional development

EU policies on teachers' professional development take a broad perspective and view the professional development of teachers both as instrumental to furthering the quality of educational outcomes and as a means to ensuring that education and training remain responsive to developments in society at large. The first is more in line with the primary focus of professional development; the second adds an emphasis on secondary processes relating to the modernisation of schools as organisations. The content of the TALIS survey reflects the breadth of this perspective by addressing aspects of professional development that address both areas. With respect to forms or types of professional development, training and qualification-oriented types of development are included with the more continuous forms that are embedded in the day-to-day work of teachers, such as discussions with colleagues and participative research. Content areas in which teachers express development needs

include aspects of teaching and of school management and administration. The results do not seem to suggest the predominance of one aspect or the other. Interestingly the two types of professional development that are experienced as most effective, namely qualification programmes and individual and participative research, are associated with both. Qualification programmes are more in line with the primary focus, teaching, and collaborative research is more related to the modernisation of schools as professional organisations. Prioritising both aspects of teachers' professional development might be a deliberate policy choice, while bearing in mind possible trade-offs between them.

Interpreting research evidence on teaching effectiveness and evaluation of HRD-related professional development

Exploration of the literature on educational effectiveness, particularly teaching effectiveness, sheds some light on what can be expected from either of the two main policy orientations to teachers' professional development as sketched above. The knowledge base on teaching effectiveness, popularly known as “what works in teaching”, is currently much stronger than that on the effects of secondary (HRM) types of continuous professional development (see Chapter 2). It would be too simple, however, to point to the former as the most likely source of improved student achievement outcomes. It should be recognised that the latter involves intermediary objectives as stepping stones to reach this ultimate objective. Another possibility is to combine the two perspectives, as in the United States' successful Comprehensive School Reform projects (see Chapter 2). Considerations regarding the effectiveness of professional development programmes might lead to discussions of ways to link data from a teachers' survey such as TALIS, to measures of educational outcomes.

Professional development of teachers as a well-established phenomenon

TALIS shows overall participation rates in professional development activities of 89% across countries. The discussion of this finding in Chapter 4 pays attention to the fact that, overall, this is a satis-

factory level. Nonetheless, it is somewhat worrying that 11% of teachers indicate that they do not participate in any kind of professional development, given that the survey relies on a broad definition of professional development that includes informal dialogue with colleagues on work-related issues. It should perhaps be emphasised here that teachers' professional development appears to be solidly established as a lever for educational improvement. This conclusion is perhaps reinforced by TALIS evidence indicating that countries that have undergone recent structural changes, such as a number of eastern European countries, are particularly active in a broad range of professional development activities.

The lessons from unmet demand and barriers and what policy can do

Key findings from TALIS were that teaching students with special learning needs and ICT teaching skills are the areas of greatest development need, and that conflict with the work schedule and lack of suitable professional development were the most important reasons for not participating in professional development activities. Overall, more than 50% of the teachers reported that they wanted more professional development than they received during the 18-month survey period.

One of the benefits of teacher surveys like TALIS is that information on unmet demand and barriers can be used to realign policy targets and priorities. This is clear for areas in which unmet demand is greatest, such as teaching students with special learning needs. Given differences among countries, this kind of information is best used on a country-by-country basis. The finding that "conflict with work schedule" was the most frequently experienced barrier to participation in professional development activities indicates that much could be gained by integrating professional development in the total work package of teachers and the functioning of schools. Changes in culture, in the sense of shared beliefs in the need for continuous teacher learning, and changes in organisation, in the sense of planning and co-ordinating professional development activities, seem better suited to resolving this problem than financial incentives

(see the discussion in OECD, 2009, Chapter 3). These cultural and organisational aspects would seem to be more manageable at the school than at national level, while national policies could facilitate schools' efforts by giving them sufficient autonomy to deal with these issues.

Professional development embedded in the larger context of school improvement models

As indicated above, individual schools, and possibly also networks in which schools co-operate, might be the most effective level at which to further stimulate professional development. This raises the question of the extent to which professional development should be a "stand-alone" policy priority or be embedded in a broader set of school policy measures. The relations explored in Chapter 5 of this report suggest that effective linkages between professional development policies and other school policies and practices are possible. Structural feedback emerged as a condition that heightened the experienced impact of professional development. Other interesting linkages that appeared relevant were a constructivist teaching orientation and staff co-operation. The literature on effective school improvement provides evidence for the potential of integrative approaches, in which teacher learning is combined with innovation in curriculum and instruction, evaluation and performance feedback, school leadership development, and the management of the school's external contacts. National policies could be supportive by providing programmes developed by experts, guidance and counselling of schools, and suitable forms of external evaluation and accountability.

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