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Supporting teacher development: Literature review

Office of Development Effectiveness

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Cover photo: Students and teacher at Caritas Technical Secondary School, East Boroko, PNG (Ness Kerton, DFAT, 2013)

Office of Development Effectiveness

The Office of Development Effectiveness (ODE) is an independent branch within the Australian Government Department of Foreign Affairs and Trade (DFAT). ODE monitors the Australian aid program's performance, evaluates its impact, and contributes to international evidence and debate about aid and development effectiveness. ODE's work is overseen by the Independent Evaluation Committee (IEC), an advisory body that provides independent expert advice on ODE's evaluation strategy, work plan, analysis and reports.

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Executive summary

This literature review identifies and evaluates evidence on the effectiveness of approaches to improving teacher quality in developing countries. It examines four categories of assistance for improving teacher quality: teacher development policies, pre-service education and training, in-service professional development, and school-based support. As far as possible, the review highlights practices that demonstrate effectiveness.

The review describes examples from different countries of practices in educational policy and teacher development focused on enhancing teacher quality. It identifies policies that support teacher development as well as the characteristics of effective pre-service teacher education programs and of high-quality professional learning programs for teachers. It acknowledges the need to modify and adapt intervention approaches to suit particular country contexts.

This literature review is one of three data sources for the 2015 teacher development evaluation undertaken by the Office of Development Effectiveness (ODE) in the Department of Foreign Affairs and Trade (DFAT). Its overarching aim is to contribute to the evidence base for assessing the efficacy of Australian educational aid interventions that address teacher quality. This evidence base will be used to inform subsequent stages of the evaluation. It will assess the extent to which Australian aid practice aligns with international good practice through the document review process.

In addition, it will inform the final evaluation report and practice notes developed by DFAT's Education Section and the design and development of future interventions focused on improving teacher quality.

Support to policy reform

Chapter 2 identifies the main policy lessons in teacher development derived from the literature and challenges to implementing these lessons in developing country contexts. It also presents examples from developing countries of initiatives aligning with international good practice.

Key policy lessons are:

1. ensure that talented people are attracted to a career in teaching

2. require that all teachers have tertiary level formal academic and teacher education qualifications

3. identify procedures to recruit and select trainee teachers from the top-third of graduating secondary students or their equivalent (e.g. career-change applicants)

4. address issues of teacher supply and demand to ensure present and future needs are met and that the number of teachers in training matches the number of positions to be filled

5. have quality control mechanisms in place to ensure the continuing high quality of teacher pre-service and continuing professional learning programs

6. establish measures to build the capacity of school leaders and classroom teachers to deliver high-quality teaching and learning.

Implementing these policies in developing countries presents many challenges. Despite these challenges, a number of developing country governments have undertaken policy reform to improve teacher quality. Examples discussed are: the introduction of new requirements for teacher certification in Indonesia in 2005; policies on teacher salary and working conditions in Cambodia; accreditation policies for teacher education in Pakistan and Vanuatu; and teacher performance management systems in Cambodia and Chile.

Pre-service education support

Chapter 3 provides insights into the potential support needed for pre-service teacher education in developing countries. On the basis of evidence from the literature, this chapter: identifies the characteristics of pre-service teacher education programs that are recognised internationally as important in producing high-quality teachers; provides an overview of the characteristics of pre-service teacher education in developing countries; and reviews the evidence on targeted support to enhance the quality of pre-service teacher education.

Significant findings from this section include:

› The characteristics of teacher education programs known to produce high-quality teachers internationally can provide a good starting point when designing initiatives to improve teacher education programs.

› Teacher educators are integral to the success of pre-service programs. Improvements in pre-service training require measures for teacher educators whose education and training is often poor. The rewards of the role are small in developing countries.

› Newer pedagogical practices in developing countries are increasingly being used with positive effect by teachers (e.g. demonstrating, using questioning and using learning materials beyond the textbook). These practices need to be fostered in initial training where pre-service teacher education is aligned with teacher needs, ongoing teacher development and the school curriculum.

› Teacher educators are agents of change in school and university curriculum review. This role includes designing and delivering the teacher education curriculum and linking teacher education providers and schools.

› Satisfactory levels of teacher subject knowledge and pedagogical content knowledge are essential to student learning. High-quality, pre-service teacher education programs provide opportunities for teachers to develop both through coursework and school experiences.

› Teacher education is more likely to be effective when it is closely connected to the reality of the classrooms teacher's experience and when pre-service teachers are trained in effective pedagogies relevant to their contexts.

› Delivery of teacher education in various distance education modes has the potential to provide efficient and cost-effective programs in high and low-income countries.

In-service teacher development support

Chapter 4 reviews in-service teacher development—the training and support teachers receive concurrently with their classroom teaching. In many developing countries, urgent demands for large numbers of teachers have precluded long periods of pre-service teacher training for new teachers. Many education systems have had to recruit untrained teachers to meet the immediate need to increase the supply of teachers. Ongoing in-service teacher development thus serves the dual purpose of providing continuing development for trained teachers and providing opportunities for upgrading the skills of untrained teachers. There is consensus in the research literature that teacher professional learning should continue throughout teaching careers.

Key findings from this chapter are:

› There is growing consensus that the most effective professional learning takes place at school level as teachers collaboratively engage in planning, assessing and evaluating student progress, innovation and reflection.

› Delivering high-quality professional learning to teachers depends significantly on the skills of trainers and their understanding of the importance of providing in-school support in conjunction with training programs.

› Excellent leadership at school level is probably the most important school-based factor in promoting and facilitating teacher in-school professional learning. In recent years, the discourse has shifted from understanding school principals as managers and administrators to new conceptions of their work as leaders of learning for pupils and teaching staff. Building the capacity of school leaders to support teacher learning in schools has therefore gained new importance in developing and developed countries. Similarly, mentoring of less experienced teachers by experienced colleagues has taken on a new importance. Mentoring is especially important in contexts where practising teachers have little or no formal teacher training.

Chapter 1: Introduction

1.1 Background

Studies have shown that 'teacher quality' is the single most important school-level variable influencing student achievement[*] (OECD, 2005). Recognition of the importance of teachers to student outcomes has resulted in a shift in aid investment from a primary focus on increasing access to education to increasing support for interventions aimed at improving teacher quality in developing countries (Colclough, 2005).

A focus on improving teacher quality to enhance educational outcomes for students has considerable scope in many developing countries. Among the factors identified as contributing to student outcomes, a high-quality teacher has the capacity to significantly influence student learning (as discussed in *Teacher quality: Evidence Review* (ODE, 2014). A recent review of 20 high-quality studies measuring the impact of teacher quality in developing countries found that teacher subject knowledge was strongly related to student learning (Glewwe, Hanushek, Humpage & Ravina, 2011). These findings support a range of other research in high-income countries highlighting this important aspect of teacher quality (Darling-Hammond, 1998; Hill, Rowan & Ball, 2005; Shulman, 1987).

Approximately 25 per cent of Australia's aid budget ($1,158 million) in 2013–14, was spent on education. Of this, at least $42 million in 2013 was for interventions that supported teacher quality.[†] While a range of current Australian government aid investments focus on teacher development, there is limited information about how these investments work and how effective they are in improving student learning outcomes. Moreover, the degree to which current practices use an evidence base derived from good practice in teacher development and the effectiveness of these practices is unclear.

The ODE teacher development evaluation seeks to address this gap in knowledge through a literature review, document review and interviews with DFAT education program managers and other stakeholders. Data from the literature review (i.e. this document) and other sources are used in the evaluation to answer these questions:

1. What are the conditions for success of teacher development investments?

2. How can lessons learned inform future programming?

3. To what extent do Australian investments in the development of teachers contribute to improved outcomes?

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[*] The impact of a range of other school-level variables on student achievement has been investigated in the research literature. These include the effects of school type, school size, school leadership, classroom composition and classroom climate. See, for instance, Hattie (2013).

[†] This figure is conservative. It is generated only using programs coded to 'teacher training', without adding any budget from the 'education policy and administrative management' category, which is the largest. Funding is allocated to teacher quality improvement programs in basic, secondary and post-secondary programs. However, figures for teacher quality components of larger programs are not available as data is not coded in this manner.

1.2 Report purpose

This literature review focuses on identifying and evaluating the evidence on approaches to improving teacher development in developing countries. As far as possible it highlights practices that demonstrate effectiveness.

This literature review describes practices in educational policy and teacher development focused on enhancing teacher quality in various developing countries. The authors acknowledge the diversity of experiences and circumstances across developing countries and the need to modify and adapt intervention approaches to suit the characteristics of particular country contexts. This latter point is significant given that the vast majority of education research literature on the topic originates from high-income countries such as the United States.

In addition, this literature review aims to summarise the evidence base for assessing the efficacy of Australian educational aid interventions that address teacher quality. This evidence base will be used to inform subsequent stages of the evaluation. It will be used to assess the extent to which Australian aid practice aligns with international good practice through the document review process. In addition, the evidence will be incorporated into the final evaluation report and practice notes.

1.3 Concepts and definitions

This literature review comprises three main chapters on the interconnecting categories of support for teacher development. The categories are defined as:

1. Support to policy reform, which refers to policies focused on teacher development, such as requirements for entering the teaching profession, teacher education, teacher professional development, recruitment and employment conditions, and monitoring and evaluation of teaching performance. Policies that improve teacher quality indirectly (e.g. distributing teachers, providing school materials, and establishing and reviewing the school curriculum) are excluded.

2. Pre-service education, which refers to education programs that prepare beginning teachers for classroom practice.

3. In-service teacher development support (including school-based support), which refers to professional development concurrent with, rather than before, classroom teaching.

These categories are informed by the conceptual framework for analysing and discussing teacher quality developed during ODE's teacher quality evaluability assessment and evidence review (Figure 1). The framework provides a common language and a model for describing interventions to address teacher quality.

While the teacher quality review developed a conceptual framework for understanding teacher quality, it recommended that the evaluation focus on teacher professional development as a subset of teacher quality. This was determined in consultation with stakeholders given that most aid activity related to improving teacher quality is through the professional development of teachers.

Given the focus on teacher development for this evaluation, and the large amount of literature available, this literature review separated the 'professional development' group in the conceptual framework into pre-service education and in-service training. Rather than only focusing on these two areas, the evaluation and literature review also examined policies and school-based activities (part of what is defined under 'school environment' in the conceptual framework) that support professional development. The broad definition of teacher development to include relevant policy reform and school-based support is consistent with the

literature and DFAT's experience, both of which indicate that successfully improving teacher knowledge and practice requires more than education or training delivery.

Figure 1: Conceptual framework: Teacher quality and the factors that influence it
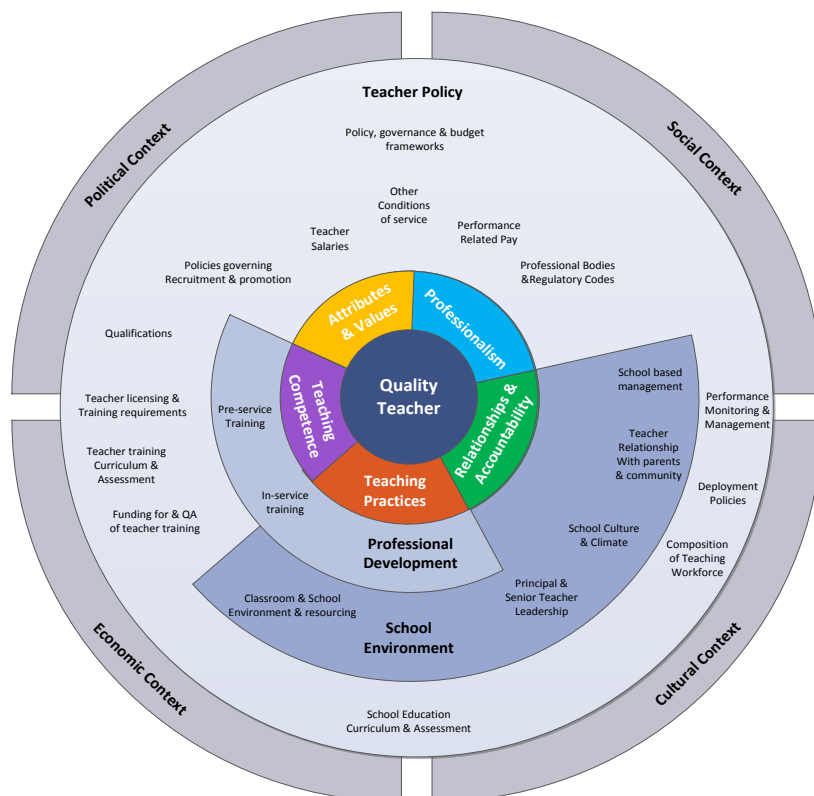
Source: Teacher quality: Evidence Review, ODE, 2013

The categories in Figure 1 represent the spectrum of support for teacher development. Within these categories, specific approaches to addressing teacher quality are being funded by Australian educational aid. In Laos, for example, support for pre-service teacher education includes an Australian educational aid initiative focusing on increasing the amount of classroom placement during teacher training. A number of countries, including Afghanistan, Laos, Myanmar and Nauru, are implementing different approaches to in-service teacher development to upgrade qualifications. Approaches include accelerated, distance and blended-learning methods. Overall, the *Teacher quality: Evidence Review* (ODE, 2014) assessment identified 14 approaches for enhancing teacher quality, supported by Australian government investment in education aid. Those identified within the categories of teacher development support are described in Table 1.

This literature review uses the term 'developing countries' to describe low and middle-income countries. The term is used when making broad statements regarding teacher development practice in these countries. In line with World Bank usage, the term is used to classify groups of like economies with no implication that all economies in the group are experiencing similar development.

Table 1. Australian aid approaches to enhancing teacher quality within categories of support

Category	Approach	Description of approach
Support to policy reform—Chapter 2	Capacity building and technical assistance to national education departments	Providing technical assistance and capacity building support to develop assessment tools, teacher professional learning and competency upgrading.
	Support to teacher competency framework development	Developing national standards that can form the framework for teacher education, monitoring and evaluation, and planning professional development.
Pre-service education support—Chapter 3	Teacher education curriculum review	Enhancing the effectiveness and relevance of the pre-service teacher education curriculum by ensuring content relates to classroom and contextual realities.
	Increased classroom-based placement of pre-service education	Ensuring that teacher education curriculum review includes increased time in classrooms.
	Professional development of teacher educators	Increasing the capacity of teacher educators to deliver existing or reformed teacher education curriculum.
	Development of master trainers in teacher training centres	Developing the capacity of pre-service teacher trainers and supporting them to train teachers in decentralised contexts.
	Flexible systems of entry and teacher training	Providing flexible systems to address teacher shortage, particularly to meet demand to improve girls' access to education (e.g. para-professional training for girls to become teachers; scholarships for girls from ethnic groups to become qualified teachers).
In-service professional development support—Chapter 4	Cascade professional learning	Delivering training to a cohort of 'master trainers' who will go on to train other teachers.
	Enhanced in-service professional development for the needs of specific groups of teachers	Enhancing skills and confidence of teachers in specific areas, including: early grade and multi-grade teaching; literacy and numeracy; pedagogical knowledge; use of technology; and subjects outside of the curricula (e.g. nutrition), all of which are necessary for teachers to serve the needs of their students.
	Accelerated, distance and blended learning (distance and residential) to upgrade qualifications	Upgrading teacher qualifications and professional certification through accelerated and/or distance training.
	Multi-modal self-paced learning	Delivering professional development through modes that can be accessed by teachers at their own pace.
School-based support—Chapter 4	Cluster school resource and support schools	Establishing local centres of excellence that model good practice within a cluster.
	School-based mentoring	Providing quality instructional leadership and professional development at school level through mentors.
	Enhanced professional skills of school leaders and head teachers	Providing professional development for school leaders and head teachers.

Source: Teacher development evaluation: Australian Council for Educational Research (ACER), Terms of Reference. ODE.

1.4 Literature review strategy

Literature on teacher development is widely dispersed across academic journals and in grey literature (i.e. documents such as government or funding agency reports not published in academic journals).

Sources of relevant material for this literature review comprised:

› ODE *Teacher quality: Evidence Review* (2014) and related documents (including an unpublished evaluability assessment)

› published academic peer-reviewed research

› a selection of grey literature (such as summary reports and project evaluations conducted by aid agencies) to supplement the findings from published academic research.

Identifying relevant literature was an iterative process between ACER, the evaluation team leader and ODE, which continued throughout the review.

Literature relevant to the review spans educational research and international development research between 1995 and 2014. The search strategy started with a search of major academic databases (e.g. Education Resources Information Center, JSTOR/Journal Storage, Proquest Education, Education Research Complete, Ingenta Connect and Informit). The first stage focused on peer-reviewed research published since 1995 using key search terms (e.g. teacher quality, teacher effectiveness, teacher development, teacher education, developing countries, foreign aid, donor aid and education aid).

Subsequent searches integrated key search terms (e.g. pre-service teacher education and developing countries) and models of support being used in Australian aid initiatives (e.g. curriculum review, teacher educators and mentoring).

The first phase of the literature search attempted to identify relevant meta-analyses and research syntheses, taking into account the breadth of literature, the timeframe and scope of the review. Literature describing teacher development initiatives and their effectiveness in developing countries was scarce, due to the rarity of research into effects of teacher development on teacher practices and student learning outcomes. The identified literature was largely limited to single country descriptions with only a small number of research reviews identified (such as Westbrook et al., 2013).

Several strategies were used to identify additional literature (peer-reviewed academic research and grey literature) not identified through formal database searches and which, while relevant, may have fallen outside the 1995 to 2014 time limitation. Reference lists for articles identified in the initial searches (particularly meta-analyses and research syntheses) were scanned to identify other relevant literature. Individual searches of selected journals identified as publishing relevant articles (e.g. *International Journal of Educational Development*, *Teaching and Teacher Education*, and *Comparative Review*) were conducted.

Searches of formal academic databases were supplemented by *Google Scholar* searches and web searches. Databases including reports on development initiatives were also searched selectively (e.g. http://www.oecd.org/derec/publicationsdocuments/education/, http://r4d.dfid.gov.uk/SiteSearch.aspx?q=education, http://ieg.worldbankgroup.org/). The scope and timeframe for the literature review precluded extensive reviews of these databases.

Three approaches were taken to identifying descriptions of teacher quality initiatives, programs or interventions in developing countries. First, further research was undertaken on relevant country examples described in summary reports and research (e.g. Moon, 2006, 2007, 2013; Schwille, Dembélé & Schubert, 2007; United Nations Educational, Scientific and Cultural Organization (UNESCO), 2004, 2006, 2014), by sourcing research cited. Second, databases reporting on development initiatives were searched to identify country-specific examples. Third, a limited amount of additional country-specific searches were undertaken by combining country search terms with teacher quality search terms (e.g. Cambodia and teacher quality or teacher education or education aid).

During these initial searches, the authors identified literature that informed all four sections of this literature review. The literature was categorised as being relevant to informing sections on support to policy reform, pre-service education support, in-service professional development support, school-based support, or more general background research on areas such as characteristics of education provision in developing countries or the importance of teacher quality.

1.5 Limitations

The initial brief for the literature review sought evidence from developing countries on interventions supported by educational aid shown to be effective in improving teacher quality. Thus, the preliminary literature review sought to identify research from developing countries that focused on teacher development in the four broad categories of policy, pre-service, in-service and school-based aid interventions. It focused on obtaining evidence for the *efficacy* of teacher development interventions in developing-country contexts, such as improved outcomes for students, evidence of change in the knowledge and skills of participating teachers, or participant perceptions of the efficacy of interventions.

The review of the research evidence for effective teacher quality initiatives in developing countries identified these seven limitations in the research literature:

Literature generally focuses on educational difficulties

Overwhelmingly, the research literature broadly describes the difficulties associated with providing education in developing countries. Such difficulties include problems associated with teacher supply; working conditions for teachers and students; and the status of the teaching profession. As yet, methods of improving the quality of the teaching workforce have received little attention in developing-country contexts.

Little evidence on the form of teacher development interventions

There are few detailed descriptions of programs, initiatives and interventions designed to develop teachers in developing countries. Available descriptions often focus on single countries or individual institutions with few cross-country comparisons. Without detailed information on the form of interventions it is difficult to make assertions about common characteristics of effective programs or link program characteristics to outcomes.

Source of evidence

The vast majority of academic research published in English on teacher quality is limited to a small number of high-income countries (especially the United States and the United Kingdom). There is far less high-quality, English language academic research on the effectiveness of teacher quality initiatives in developing countries. A high proportion of available academic research from developing contexts focuses on sub-Saharan Africa. The fact that studies focus disproportionately on one geographic area limits the extent to which findings may be generalised.

Rigour of evidence

Detailed descriptions of teacher quality initiatives are less common in formally published academic literature and more common in the grey literature (including conference proceedings and theses, reports and working papers from government organisations and non-government organisations, such as syntheses of research or project documentation). While journal articles

are usually peer-reviewed, the process through which grey literature is developed and reviewed can vary widely and some caution is warranted in using and interpreting these sources.

Teacher quality is not yet the main focus of educational development

Educational initiatives in developing countries are often very broad. Such education development projects include many components, with improving teacher quality only one (often small) part. The research describing such system-wide education improvement projects in developing countries often focuses broadly on improving education for students in developing countries, with only limited reference to teacher quality and teacher development.

Little evidence for the effectiveness of teacher development interventions

There is scarce compelling research evidence for the effectiveness of educational interventions in improving teacher quality in developing countries. There is little emphasis on critically evaluating the efficacy of teacher development, in terms of strengths and weaknesses of approaches in specific contexts as well as the impact on student learning outcomes.

It is understandable that the research evidence on improving teacher quality in developing countries is less substantial. To date, the focus in developing countries has been on achieving outputs such as increasing the number of teachers trained, providing resourcing to schools (such as new buildings, text books and furniture), increasing student enrolments overall and increasing access to primary education for girls and students in remote locations. The more complex task of assessing the quality of education outcomes has received less attention (Riddell, 2012).

It is also often difficult to objectively assess the impact of educational initiatives on teachers and students. For instance, it is rare for educational interventions financed through foreign aid to assess impact by measuring student learning outcomes (Chapman & Moore, 2010). A recent review of nine meta-analyses of the effectiveness of developmental assistance to education showed that often project evaluations were poorly designed, relying on measuring project outputs (e.g. numbers of teachers trained) with little attention to outcomes (such as student achievement) (Chapman & Moore, 2010). Across 33 United States Agency for International Development (USAID) education aid projects reviewed for 1990–2005, Chapman and Quijada (2009) found that most interventions proposed increasing education quality as a goal, but very few assessed growth in student learning as an outcome.

Although evidence of the effectiveness of aid interventions on improving teacher quality is scarce, there may be indications that the interventions incorporate aspects of good practice in teacher policy, pre-service teacher education and ongoing professional development.

Difficulties in causal attribution

It is generally acknowledged that connecting teacher effectiveness or changes in teacher effectiveness to improved student learning outcomes is a significant challenge (Ingvarson & Rowe, 2008; Levine, 2006; Wilson, Floden & Ferrini-Mundy, 2001). Although the research on teacher quality and teacher education is extensive in high-income countries, in general the research evidence linking approaches to improving teacher quality to student achievement remains limited. Teacher quality is identified as a significant factor in improved student outcomes, but relatively few studies in developing countries can claim to provide rigorous empirical evidence to assess the relationship (Wayne & Youngs, 2003).

In reviewing the available evidence on improving teacher quality in developing countries, the difficulty of attributing effects on student learning outcomes to initiatives, programs and

interventions must be acknowledged. A recent summary of these arguments follows (Riddell, 2012, p. 12):

› Short-term program impacts do not necessarily mean that the intervention will work on a larger scale, or that results will be sustainable.

› Program impacts need to be isolated from other factors, including other programs and interventions operating concurrently.

Improving educational outcomes for students in developing countries is also a product of many factors, including teacher quality. Teachers and teacher quality are one component of the complex array of variables contributing to overall school effectiveness. There has been little attempt to investigate the complex relationships between factors influencing educational quality in developing country contexts (Riddell, 2008).

These analyses highlight some notable limitations in the available research evidence specific to developing country contexts. They imply that identifying teacher quality interventions with rigorous evidence of effect may be challenging. The limited evidence for teacher quality interventions in developing countries suggests a need for greater focus on documenting and explaining the strengths and weaknesses of different solutions.

1.6 Structure of the report

This literature review is presented in three main chapters corresponding to the discussion of evidence for the characteristics of effective approaches to improving teacher quality:

› support to policy reform (Chapter 2)

› pre-service education support (Chapter 3)

› in-service professional development support and school-based support (Chapter 4).

Chapter 2 describes six lessons about education policy reform focused on teacher development. It synthesises the evidence base for the policies, discusses the challenges in implementing such policies in developing countries, and provides examples from developing country contexts where there is evidence of implementing such policies.

Chapter 3 describes the characteristics of pre-service teacher education programs shown to be effective in producing high-quality teachers internationally, describes the characteristics of pre-service teacher education in developing countries, and discusses approaches to improving teacher quality through pre-service teacher education.

Chapter 4 addresses the two categories (refer Table 1) of in-service professional development and school-based support because both involve ongoing support for practising teachers (in-service rather than pre-service), either directly through professional learning or indirectly through interventions such as training for school leadership teams. Chapter 4 describes the characteristics of high-quality teacher development for practising teachers internationally. It discusses barriers and enablers of effective in-service professional learning for teachers in developing countries, and reviews the evidence on approaches to school-based support

Chapter 2: Support to policy reform

2.1 Introduction

This chapter discusses education policy reforms that support increased teacher quality through teacher development. It suggests six lessons about education policy reform relevant to teacher development and synthesises relevant international evidence. It highlights the challenges of implementing good teacher development policies in developing countries with examples from the literature.

Policy is defined as a set of principles and guidelines designed to influence major decisions and actions and achieve outcomes. Policies are expressed through procedures that influence the day-to-day operations of an organisation. Together, policies and procedures ensure that the views expressed in the policies are translated into steps that result in outcomes compatible with those views (Spillane, Gomez & Mesler, 2009).

Governments in most countries have established policies for improving the quality of school teaching and students' opportunities for learning. These policies are set by governments to regulate issues such as requirements for entering the teaching profession, teacher education, teacher professional development, recruitment and employment conditions, and monitoring and evaluation of teaching performance. *Policies related to the broader construct of teacher quality, but not teacher development, are outside the scope of this literature review and related evaluation.* Examples include policies about distributing teachers, providing school materials, and establishing and reviewing the school curriculum.

Much of the research related to improving teacher development has been in countries such as the United States and United Kingdom. While it is useful to examine the general principles identified from this research, the extent to which those principles can be operationalised in different countries and circumstances may be problematic. The quality of teacher development programs depends to a significant extent on the wider social, policy and regulatory contexts. It is therefore important to consider contextual factors when assessing whether 'good practice', as identified in the international literature, is transferable across a variety of countries and situations.

A key element in the research relating to increasing teacher quality through teacher development is setting teaching standards for initial teacher education and teacher certification. Standards development is complex and linked to methods of evaluating teachers against standards. It is further complicated in situations where large numbers of new teachers are required immediately to meet urgent educational needs, as is typical in many developing countries.

The literature reviewed for this chapter identifies six broad policy lessons for the establishment of effective policy in the area of teacher development. These lessons recommend that policies:

1. ensure that talented people are *attracted to* a career in teaching

2. require that all teachers have tertiary level formal academic and teacher education *qualifications*

3. identify procedures to *recruit and select* trainee teachers from the top-third of graduating secondary students or their equivalent (e.g. career-change applicants)

4. address issues of teacher *supply and demand* to ensure present and future needs are met and that the number of teachers in training matches the number of positions to be filled

5. have *quality control* mechanisms in place to ensure the continuing high quality of teacher pre-service and continuing professional learning programs

6. establish measures to build the capacity of *school leaders and classroom teachers* to deliver high-quality teaching and learning.

Globally, the most successful national school systems (as measured by national and international tests of student achievement) are well advanced in translating these principles into effective policies. Conditions in many developing countries make such translation difficult.

2.2 Evidence for these policy lessons

2.2.1 Policy lesson 1: Sound education policies ensure talented people are attracted to a career in teaching

International research indicates that the quality of teachers graduating from a teacher education program, and their eventual effectiveness in the classroom, depends in part on the quality of the students (Boyd, Grossman, Lankford, Loeb & Wyckoff, 2009; Feuer, Floden, Chudowsky & Ahn, 2013; National Research Council, 2010). Teacher quality thus largely depends on the calibre of those choosing to become teachers. Conversely, choosing to become a teacher depends on how attractive the profession is with compensation, working conditions and status (Vegas, 2005).

Compensation

The research indicates a relationship between the academic quality of applicants for teacher education programs and the level of teacher salaries relative to other professions. The evidence shows that people contemplating a career in teaching take salary levels of comparative professions into serious consideration before making their decision (Boyd et al., 2009; Dolton & Marcenaro-Gutierrez, 2011). It also shows that higher salaries attract more able people into teaching (Barber & Mourshed, 2007; Hanushek, Kain & Rivkin, 1999; Leigh, 2012).

In a study across 30 countries, Akiba, Chiu, Shimizu and Liang (2012) found that salaries of experienced teachers relative to other professions distinguish countries with higher student achievement. Consistent with this, Carnoy, Beteille, Brodziak, Loyalka & Luschei (2009) found that even when other factors, such as student background, are controlled for, students with male teachers do better on mathematics tests in countries where those teachers are paid more relative to males' salaries in competing professions (similar level of education who are employed or trained as scientists). The finding does not apply to female teachers. There is no correlation between competitive wages and increased student mathematics scores.

Recent research also indicates a positive relationship between investment in teacher salaries and Programme for International Student Assessment (PISA) performance. High-performing countries focus educational policy directly on recruiting academically successful students and treating teachers as professionals (Barber & Mourshed, 2007; OECD, 2011). In their study of teacher pay and performance (using PISA scores) across 39 countries, researchers at the London School of Economics found 'a highly significant and positive effect of teacher wages on pupil test scores' (Chevalier, Dolton & McIntosh, 2007, p. 41). This research also showed that the number of high-quality male graduates who choose teaching moves up and down as relative

salaries for teachers move up and down. Top-scoring male graduates are less likely to teach than female top-scoring graduates.

Teacher salaries in Chinese Taipei, Korea and Singapore—all high-performing countries in PISA tests—are among the highest in the world (OECD, 2011). The evidence indicates that policies have created a strong incentive among abler graduates in those countries to join the teaching profession (Ingvarson et al., 2013, p. 155). Tatto, Krajcik & Pippin (2013, p. 34) comment: '... in those countries where [entrance to teaching] is competitive, the salaries are as well.'

Other correlational research on high-performing countries shows that even where teacher salaries are not extremely high they are at least on par with the salaries of other civil servants (Carnoy et al., 2009; Mourshed, Chijioke & Barber, 2010; OECD, 2011).

On the basis of available evidence, Ingersoll (2007) argues there is no point in lifting requirements for teacher education courses without ensuring that teacher salaries are as attractive as those of other professions competing to attract able graduates. Establishing cohorts of high-calibre, pre-service teachers who have expectations of a well-remunerated career is an incentive for attracting similar candidates who want to be part of a respected professional group. This also has implications for the rigour and quality of teacher education courses and for policies governing the registration and certification of teachers.

Working conditions and status

Most high-performing countries provide secure and rewarding career paths that attract people of high ability to a career in teaching. In most education systems teachers can aspire to principal and other leadership positions, but in addition to these 'vertical' promotion opportunities, a growing number of successful systems offer 'horizontal' promotion positions allowing teachers to remain more closely connected to the classroom (Darling-Hammond, 2010). In Singapore, career paths are defined, well remunerated and matched to teacher-interests. Teachers may choose between master-teacher, curriculum developer or school leader positions (OECD, 2011).

Research demonstrates that teachers have strong views about where they work (Boyd et al., 2009; Hanushek, Kain & Rivkin, 2004). Chaudhury, Hammer, Kremer, Muralidharan and Rogers (2006) found that poor working conditions affect teacher attendance.

In Finland, Shanghai and some other high-performing education systems, teachers spend less time in face-to face teaching—about 10 to 12 hours per week in contrast to Australia's 20 hours per week (Jensen, Hunter, Sonneman & Burns, 2012). This creates more time for professional collaboration, planning and monitoring student achievement (Barber & Mourshed, 2007; Morris & Patterson, 2013). These benefits only accrue in systems where there is an understanding that teacher work time includes duties that support their face-to-face instruction.

Evidence supports claims that lower student-teacher ratios can improve in-class interaction and teacher working conditions (Angrist & Lavy, 1999; Bloom, Thompson & Unterman, 2010; Case & Deaton, 1999; Krueger & Whitmore, 2001) thereby making teaching a more attractive profession. In some cases, however, these lower ratios can only be achieved by employing greater numbers of less qualified or unqualified teachers (Jepsen & Rivkin, 2009). Data from high-performing systems shows that student-teacher ratios do not exceed 30 for primary classes and 20 for secondary.

2.2.2 Policy lesson 2: Sound education policies require all teachers to have tertiary level academic and education qualifications

In successful education systems, all teachers demonstrate high-level academic and professional knowledge and skills gained in rigorous, relevant, tertiary level degree programs.

In Canada, student teachers complete at least four years of tertiary study leading to a Bachelor of Education (B.Ed) degree. If they have a degree in an academic specialty outside of education, they are required to achieve the B.Ed. as well. Those with four year academic degrees in an area outside of education can acquire their education degree in one or two years.

In Germany , where PISA results are now showing improvement, all entrants to teacher education courses are required to have passed a demanding *Abitur* or matriculation examination, after which they study for three years in an initial 'academic' phase and then two years in a 'pedagogic' phase during which they work in schools for most of the time (Blömeke, Suhl, Kaiser & Döhrmann, 2012; König & Blömeke, 2013; OECD, 2011).

In Finland, teacher preparation degrees are 'academic' in that they are strongly research and evidence-based. Every student completes a Masters' degree thesis in education or the subjects they will teach. Successful completion generally takes between five and seven years (Sahlberg, 2011a).

In Singapore, postgraduate Diplomas in Education are awarded after four years of degree study and one year of pedagogical training. The system also offers a non-graduate, two-year diploma program for primary teachers, and concurrent degree programs. In 2001, these were positioned as four-year Bachelor of Arts (Education) and Bachelor of Science (Education) with a fifth optional year in a subject discipline (Schwille, Ingvarson & Holdgreve-Resendez, 2013).

In Chinese Taipei, most students graduate with a Bachelor's Degree before they undertake the practicum. They then work as interns at a primary or secondary school for at least half-a-year under the supervision of a mentor (Hsieh, Wong & Wang, 2013)

Other countries that perform well or moderately well in international tests of student achievement, such as Australia, France, Israel, Scotland, United Kingdom and United States, all require their teachers to have tertiary level academic and professional qualifications.

2.2.3 Policy lesson 3: Sound education policies identify procedures to recruit and select trainee teachers

Virtually all countries that achieve well in international tests of student achievement—such as PISA, Trends in International Mathematics and Science Study, and Progress in International Reading Literacy Study—recruit and select prospective teachers from the top-third of graduating secondary students: the top 5 per cent in South Korea, the top 10 per cent in Finland, and the top 30 per cent in Singapore and Hong Kong (Barber & Mourshed, 2007, p. 16).

In Canada, admission requirements are decided by individual teacher training institutions, but all institutions select trainees from the top 30 per cent of cohorts, and prospective pre-service teachers must have high Grade Point Averages to gain entry to teacher training (Mehta & Schwartz, 2013; Morris & Patterson, 2013).

In Chinese Taipei, the Teacher Education Act stipulates that students must be enrolled in their second or higher year of university, or enrolled as masters or doctoral students before they can be admitted to a teacher education program. All applicants have to pass the national university entrance examination, which has mathematics as a required test subject (Ingvarson et al., 2013, p. 175).

In Finland in 2010, more than 6600 applicants competed for 600 available places in pre-service teacher education courses. In 2011–02, nearly 2400 applicants competed for 120 available places in the Faculty of Education at the University of Helsinki (Sahlberg, 2011a, 2011b). Tatto et al. (2013, p. 34) comment: 'The recruitment and selection of highly qualified students for teacher education is the most common strategy used by those systems with high quality assurance.'

As well as recruiting and selecting prospective teachers from the top-third of secondary school graduates (or equivalent for late-entry applicants), some education systems have other measures in place to ensure suitability to undertake a teaching qualification. For example, Singapore's single state-wide selection process for pre-service teachers is managed jointly by the Human Resources Department of the Ministry of Education and the National Institute of Education (the nation's only teacher training institution) (Barber & Mourshed, 2007).

2.2.4 Policy lesson 4: Sound education policies effectively manage teacher supply and demand

In the successful education systems of Chinese Taipei, Finland and Singapore, the number of places in teacher training is limited by projections of demand for new teacher recruits (Barber & Mourshed, 2007). In Chinese Taipei, in 2005 and 2006, the Education Review Committee decided that following a decrease in demand for teachers, admission quotas would be adjusted so that some universities would have to reduce their numbers of student places in education and others would have to discontinue their programs altogether. In Finland, the number of teacher training places in universities is capped according to workforce requirements. England also ensures a close match between supply and demand through its system for funding teacher education. In France, in 2002, more than 50 000 applicants sat the selective examination for the 12 000 available primary school teaching positions. In Ireland, where demand for new teachers is also exceeded by supply, only medicine attracts more highly qualified recruits (Moon, 2007).

2.2.5 Policy lesson 5: Sound education policies include measures to quality assure pre-service and continuing professional development for teachers

The establishment of sound quality assurance measures for teacher development from the pre-service period to continuing teacher development is an important feature of effective teacher education policy. Successful education systems have established well-regulated teacher education systems and rigorous procedures for the accreditation of teacher education programs.

Accreditation of teacher education programs is an endorsement by an external agency that graduates of the program are competent to enter the teaching profession. In England, the Office for Standards in Education, Children's Services and Skills is responsible for inspecting all providers of pre-service education that lead to Qualified Teacher Status. The National College for Teaching and Leadership, an executive agency of the Department of Education, accredits courses. Other agencies with authority to accredit teacher education programs include the General Teaching Council for Scotland, the Ontario College of Teachers in Canada and the Council of Accreditation of Educator Providers in the United States.

Self-evaluation of teacher training courses by the responsible institution is a key part of most effective accreditation and quality assurance processes. In Japan, each teacher-training institution must conduct a self-evaluation before the accreditation process that takes place every seven years. External accreditations are conducted by the Japan Institution for Higher Education Evaluation (Tatto et al., 2013). Under the Teacher Education Act of 2002 and the Teacher Enforcement Rules of 1995, Chinese Taipei has quality control mechanisms at every stage of teacher education, from selection through to certification.

Hong Kong and South Korea employ accreditation practices similar to those of Japan. In Hong Kong, self-evaluation must include feedback from staff, students and past external examiners (Tatto et al., 2013). In South Korea, financial support and administrative decisions are tied to the evaluations which include a site evaluation conducted by a team from the Ministry of Education, Science and Technology (Tatto et al., 2013).

The National Institute of Education is the sole provider of teacher-preparation courses in Singapore. It emphasises that *improvement* is the chief goal of the evaluations in accreditation processes. Evaluations for accreditation consider teacher goals and interests, inputs to achieve the goals, and expected outcomes. A feature of the quality assurance mechanisms in Singapore is that they rely on close cooperation between the Ministry of Education, the National Institute of Education and the schools, and strong feedback mechanisms are in place.

An important aspect of ensuring the quality of those who become registered and accredited as a teacher is to filter candidates at different points before people are admitted to practice. High-performing education systems have rigorous filters at different stages, especially for entry to teacher education programs (Figure 1). Figure 1 shows that Japan and Korea have a large number of high-stakes filters along the teacher selection, education and development pipeline. These contribute to outcomes such as the fact that more than 90 per cent of Grade 8 teachers in Japan and Korea have majored in mathematics compared with only 61 per cent in the United States.

Figure 1. Comparison across countries of teacher development filters

Filters used along the teacher education and development pipeline								
	Entry to teacher education program	Evaluation of practical experience requirement	Exit from teacher education program	Certification	Hiring	Evaluation of induction period	Evaluation of professional development	Evaluation of probation period (for tenure)
Australia*	◉	◉	●	◉	○	○	○	◉
England	○	●	○	●	○	○	○	◉
Hong Kong	◉	◉	○	○	○	○	◉	●
Japan	●	●	○	○	◉	◉	●	●
Korea	●	◉	●	○	●	○	●	○
Netherlands	●	●	◉	○	○	○	○	◉
Singapore	●	◉	○	○	◉	◉	○	○
United States*	◉	○	◉	●	○	○	○	○

● High stakes   ◉ Medium stakes   ○ Low or no stakes

Source: Wang, Coleman, Coley & Phelps (2003, p. 9)

In Australia, each state and territory has a statutory body that accredits teacher education programs. Similar to other countries that have accreditation agencies, Australia's accreditation processes are based on national professional teaching standards that set out what teachers are expected to know and do at certain career stages. In effect, these standards represent a considered national consensus on what is considered to be 'quality teaching'. Course accreditation procedures are designed to give emphasis to outcomes (i.e. graduates' levels of competence as measured against the standards) more than course content.

To successfully graduate from any pre-service teacher education course in Australia, candidates must demonstrate that they meet the appropriate standards which set out what is expected at graduate level in the three standards areas of: (1) professional knowledge, (2) professional practice and (3) professional engagement. The university or other education provider is responsible for this assessment. Standards at the next level are used to determine teacher

readiness to become fully registered (certified) after an induction period. Responsibility for this assessment rests with government agencies or statutory teacher registration authorities.

2.2.6 Policy lesson 6: Sound education policies build the capacity of school leaders and classroom teachers to deliver high-quality teaching and learning

The extent to which teachers, as individuals and groups, can be held accountable and rewarded for improving student learning is a much debated area in the literature (Ingvarson & Rowe, 2008; Johnson, 1986; Odden & Kelley, 2002). It is now recognised that if school students are to learn successfully, the knowledge and skills of their teachers needs to continually develop and improve.

The two general approaches to education reform in this policy area are outlined in Box 1 (adapted from Masters 2015, p. 9).

Box 1: Two effective education policy reforms to improve school-level teacher development

1. Improvement will occur if schools are given incentives to improve (rewards, sanctions, having to compete for students).

- stronger performance cultures
- better measures of outcomes
- personal accountability for improvement
- performance pay linked to test scores
- greater public transparency
- financial rewards for school improvement
- sanctions for failure to improve
- increased competition for students
- greater autonomy to compete
- more parental choice

2. Improvement will occur by building the capacity of teacher and school leaders and by ensuring high- quality practice throughout the system.

- attract more able people into teaching
- train approximately the number of teachers required
- place a high priority on building teacher content and pedagogical knowledge
- develop the capacity of school leaders to build and lead cultures of continual improvement in teaching and learning
- ensure that high-quality teaching and leadership are equitably distributed across all schools

Research shows that countries that have been pursuing strategies that support the first (performance) approach tend to be those that have experienced the greatest declines in student performance over the past decade. Although it is not possible to attribute these declines to any education policy, it is difficult to conclude that incentive schemes and school accountability arrangements in these countries had a positive impact on school performance (Masters, 2014, p. 8).

Masters tables useful strategies to improve the learning and development of teachers and of their schools as professional learning communities. These include:

› setting an explicit school improvement agenda

› systematically monitoring progress in achieving desired improvements

› establishing and sustaining a culture of support and high expectations

› targeting the use of school resources to address student needs

› encouraging teachers to work as a team to improve teaching and learning

› establishing a coherent, sequenced, shared school curriculum

› sustaining a strong focus on addressing individual learning needs

› implementing effective pedagogical practices, including diagnostic practices

› using local community resources to better meet student needs (Masters, 2007, p. 11).

2.3 Challenges for implementing these policies in developing countries

A thorough search of the literature shows that few developing countries have implemented strong, effective policies, strategies or programs that are aligned with the international evidence for attracting, recruiting, developing and retaining sufficient numbers of quality teachers. This is largely a fiscal problem, given that 'ensuring an adequate supply of quality teachers requires monetary resources that many countries do not presently have and are unlikely to get in the near future' (Mulkeen, Chapman, DeJaeghere & Leu, 2007, p. x). In addition, policies of reform can be complicated in that it can take many years to show results. For example, the policy reforms that led Finland's education system to advance to its present high status were introduced in the 1960s, more than 50 years ago. Before that time, the Finnish system was on a par with Malaysia and Peru, with only one in 10 Finns completing more than nine years of basic education (Masters, 2014, p. 6).

The next section outlines the challenges for implementing policy in developing countries that align with international policy lessons.

2.3.1 Attracting educated people to the teaching profession in developing countries

In one sense, it can be seen that problems of teacher quality begin and end in schools themselves in a kind of vicious cycle. Poorly educated school students become poorly educated teachers incapable of improving the learning of their students. This cycle can be broken if sufficient numbers of talented people are found and attracted to teach in schools.

The most recent Education For All (EFA) Global Monitoring Report (UNESCO, 2014) asserted that teaching is often seen as a second-class occupation for people whose academic results are not good enough to allow them entry to more prestigious careers like law or engineering. This report also notes that teaching often fails to attract the right balance of men and women and find a good mix of applicants from disadvantaged backgrounds or conflict-affected areas. The level of education required to enter teaching, according to the EFA Global Monitoring Report, is a 'signal of the field's professional status' (UNESCO, 2014, p. 234). Moon (2007) attributes this to two factors in developing countries. First, the decline in salaries relative to other comparable professions as documented by Colclough, El-Samarrai, Rose and Tembon (2003), which is partly attributable to the emergence of other 'knowledge-related' professions that now employ (at higher salaries) the types of people once attracted to teaching, and second, the population devastation due to HIV/AIDS. The United Nations Children's Fund (UNICEF) (2000) estimated that one million children a year in Africa were losing their teachers due to AIDS.

Competent people will not be attracted to teaching in situations where salaries and working conditions of teachers are extremely poor. The evidence shows that already low teacher pay in countries across the developing world continued to decline further in the first decade of the 21st century. In Zimbabwe, in 2009, despite assistance from the United States of US$150 per month, teachers in schools in rural areas were paid well below the country's poverty line

(UNESCO, 2014). The Voluntary Service Overseas (VSO) (2002, p. 37) study found that in Malawi and Zambia, teachers did not even receive a living wage.

> Teachers reported feeling that they were the lowest of the low, the neglected and forgotten profession. They were particularly aggrieved that their status had fallen below other public servants when their contribution to national development was just as great.

Working conditions also remain critically poor:

> ... teachers in some parts of the world are working in simply appalling circumstances. Ms Mokoteli and Ms Ramokejae (actual teachers) teaching first-grade children on the edge of Maseru, the capital of Lesotho, have 210 children in their class. Ms Molotsi and Ms Mpalami (also actual teachers) in grade 2 have 205 children. Whatever the rhetoric of reform and improvement, these conditions still exist across many parts of sub-Saharan Africa and South and East Asia. *(Moon, 2007, p. 21)*

Under such conditions it is likely that most people who choose to become teachers will have very low levels of academic achievement. This will affect the rigour and sophistication of teacher education programs, the levels of knowledge and proficiency of graduates and, finally, the education standards in schools. This, in turn, makes the teaching profession more unattractive to able candidates who have other career choices: most professional people want to belong to a profession known for its high qualification standards and requirements.

Schwille, Dembélé and Schubert (2007, p. 41) point out that, especially in developing countries, the pool of prospective applicants to teaching is 'far from optimal'. Citing the VSO Report (2002), which drew on qualitative data from Malawi, Papua New Guinea and Zambia, these authors argue that because teachers in those countries are underpaid, paid late, or not at all, and are unsupported by education bureaucracies, attrition rates are high, turnover is constant, and the status of the profession is declining to the extent that teaching is becoming an increasingly unattractive career option.

2.3.2 Policies on tertiary level academic and education qualifications for teachers

The greatest challenge for developing policies that require all teachers to have tertiary level formal academic and teacher education qualifications is the staggering number of teachers required by systems of mass education. Schwille (2007) points out that this is true of resource-scarce countries. Bernard, Tiyab and Vianou have stated that if all of the anticipated 180 million children in Africa are in school by 2015, the continent will need 4 million teachers to be working in public schools at that time. The resources and costs of putting 4 million people through an extended formal tertiary level program are immense and, certainly in the shorter term, the associated problems insurmountable. Lewin & Stuart (2002), on the basis of their study of teacher education costs in four countries, concluded that, in many countries, targets for universal enrolments and student–teacher ratios could not be achieved with conventional tertiary teacher preparation programs of up to three years.

Even if it were possible to develop and fund sufficient tertiary education places for all prospective teachers, the numbers of suitable applicants would likely fall far short of requirements. As pointed out in Section 2.3.1, many commentators have noted that teaching does not attract the best candidates when compared with other professions. Academic standards and conditions in many schools are so low it is difficult for universities to provide courses of sufficient rigour and complexity to meet the standards of acceptable programs of formal tertiary education.

Another issue is that debates around the *value* of extended formal tertiary preparation courses for teachers are common in both developed and developing countries, with some commentators

maintaining that much university based, pre-service training is ineffective (UNESCO, 2004). These debates have encouraged some developing systems with limited resources to argue the benefits of cheaper alternatives in the form of various types of apprenticeship models, where teacher on-the- job learning becomes the 'primary modality' for teacher training (Schwille, 2007).

2.3.3 Policies to recruit and select high-quality teachers in developing countries

Policies that promote the recruitment and selection of high-quality teachers are influenced by the UNESCO-led movement to meet the learning needs of all children in developing countries by 2015. Key contributors to these policies include the Department for International Development (DfID), USAID, the Japan International Cooperation Agency, and multilateral agencies such as UNESCO, UNICEF and the World Bank. These agencies can influence policy by providing finance, promoting dialogue about policy objectives and priorities, and supporting governments to develop strategies and frameworks for improvement. Complications are caused mainly by these factors:

› the need to recruit teachers within relatively short timeframes

› low and widely varying levels of school education among prospective applicants for teacher training

› lack of gender and ethnic diversity in the teacher population, to match the diverse student population.

The need to recruit teachers within relatively short timeframes has created a tension between the numbers required and the quality of people recruited. In some countries it has proved difficult to recruit teacher education candidates proficient in the language of instruction. In Kano State, Northern Nigeria, 78 per cent of 300 basic education teachers were found to have limited knowledge of English, the language of instruction (Education Sector Support Programme in Nigeria, 2011). Similarly in Gambia, teachers who were teaching in English scored poorly on basic English language tests (Mulkeen, 2013).

Recruiting and selecting teacher trainees with low levels of education presents many problems. When most students have not mastered basic subject knowledge during their own schooling, training institutions cannot guarantee the higher subject knowledge expected of practising teachers among their graduates.

Other important considerations for teacher recruitment in developing countries are gender and ethnicity issues. The *EFA Global Monitoring Report 2013–14* (UNESCO, 2014) notes that ensuring a representative numbers of female teachers and teachers from a wide range of backgrounds is an important strategy for providing inclusive, high-quality education.

> Recruiting teachers from under-represented groups to work in their own communities ensures that children are taught by teachers familiar with their culture and language. Local recruitment can also help increase the supply of teachers in areas affected by conflict. *(UNESCO, 2014, pp. 234–235)*

In more remote areas of Afghanistan, where women can only work if chaperoned by family members, the number of female teachers is much lower than in the capital, Kabul. In Uruzgan Province, most of which is remote and unsafe, no female teachers have the minimum qualification (Wirak & Lexow, 2008). The *EFA Global Monitoring Report 2013–14* (UNESCO, 2014) suggests that one solution to this problem is local recruitment of educated girls. But, again, the problem is that access to effective primary schooling is difficult for young people of both genders.

The EFA Global Monitoring Report also cites the example of the Lao People's Democratic Republic, where few girls become teachers because few have managed to complete primary school (Kirk, 2006). Such a finding highlights the importance of achieving and maintaining universal access to primary education as a precondition for ensuring a supply of suitable candidates for teacher education.

Simply lifting qualification limits to enter teaching may exacerbate the problem of how to provide more women with access to teacher training. In Cambodia, policy changes in the 1990s raised the entry requirements for teacher training from 10 years of education to 12. The result was very low recruitment of women from rural areas, where very few girls have access to upper secondary schools (Geeves & Bredenberg, 2005).

Recruiting and selecting teacher–education candidates of high calibre has obvious consequences for school student achievement. An analysis of the 2011 Trends in International Mathematics and Science Study results for Grade 4 from 45 countries, prepared for the EFA Global Monitoring Report (UNESCO, 2014), found that in countries where measures of teacher quality were low, student achievement also tended to be low.[*]

2.3.4 Policies on managing teacher supply and demand in developing countries.

The advantage of a supply of prospective teachers exceeding demand is that education systems in this situation can afford to be highly selective in deciding which applicants are most suitable to be trained as teachers. This tends to raise the quality of teachers and teaching in those countries. However, rapidly expanding education systems, especially those in developing countries, are faced with the reverse situation as new policies designed to promote universal primary education create an urgent demand for teachers that cannot easily be met.

The Global Campaign for Education (UNESCO, 2006), working from UNESCO data, estimated that 14 to 22.5 million additional teachers would be needed globally to achieve EFA (the number depends on target pupil teacher ratios). Many more serving teachers urgently need education and training.

Lewin (2002) documented the shortfall in primary teachers that had arisen from the expansion of education to meet EFA targets. Lewin and Stuart (2003) claimed that Ghana had only one-quarter of the teachers it needed and Lesotho only one-fifth. Citing examples in most French-speaking African countries, Schwille et al. (2007, p. 45) notes that the urgent need to recruit teachers to meet targets for universal primary education often resulted in emergency teacher education programs designed in a 'sink or swim' mode, where teachers receive minimal training (generally around 45 days) before being placed in classrooms of 100 or more students. Schwille et al. (2007) go on to state that in many places teachers receive no preparation. As an 'extreme case', Schwille cites Chad, where, in 2001, such untrained teachers made up 63 per cent of the teaching force.

Dembélé and Miaro-II (2003) draw attention to the scale of the need for new primary teachers in some African countries, the large number of unqualified teachers in schools and the difficulty of attracting new applicants. A survey of 11 eastern and southern African countries by UNESCO (2000) showed that one-third of practising primary teachers were untrained. Moon reports data from UNESCO (2006) showing a decline in Nigeria in the percentage of trained primary teachers

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[*] The study used an index of teacher quality, including teachers' job satisfaction, their understanding of their school's curricular goals, their degree of success in using their school's curriculum, their expectations for student achievement and teacher absenteeism (UNESCO, 2014).

from 97 per cent to 72 per cent from 1999 to 2002, which is reportedly a direct result of government policy to recruit volunteer teachers as a method to increase the supply of teachers without increasing costs (Moon, 2007, p. 5).

Better matching the supply of teachers to demand involves finding ways of filling teacher vacancies in areas where teachers are reluctant to teach. In developing countries especially, these areas are likely to be in remote and/or deprived districts that lack basic facilities. Some countries have policies to deal with this situation. Planned deployment, as the *EFA Global Monitoring Report 2013–2014* (UNESCO, 2014) states, works best in countries where the government has control over the assignment of teachers to schools. Under one scheme in Cambodia, teachers were given US$12.50 per month for postings in rural areas, or $US15 for districts designated as 'remote'. This scheme was only partially successful, however, as the incentive payment was not high enough (Benveniste, Marshall & Araujo, 2008). In contrast, the rural hardship allowance in Malawi, introduced in 2010, raised the salary of a newly recruited teacher by one-quarter (Steiner-Khamsi & Kunje, 2011).

In some countries, disadvantaged students are taught by the least experienced teachers and pupil teacher ratios are inequitable. The pattern is one of teachers with superior knowledge and skills being deployed in wealthier urban areas while weaker teachers are assigned to more disadvantaged students. Shortages of teachers in rural and remote areas arise from other factors related to ethnicity and language, gender and subjects, including shortages in teachers of mathematics, sciences and foreign languages. The shortages and inequitable deployment of teachers continue to perpetuate inequity in student achievement (Guadalupe, Leon & Cueto, 2013; Luschei, 2012; Metzler & Woessmann, 2012).

In education contexts where the supply of recruits to teaching is insufficient to meet the demands of rapid expansion, a danger exists that issues of teacher quality may be subsumed in urgent and necessary efforts to find sufficient 'warm bodies' to teach the children. Moon (2007, p. 3) comments that, while the issue of teacher quality is central to the achievement of universal primary education, 'few of the declarations, including the declaration of the World Forum in Dakar in 2000, or the MDGs [Millennium Development Goals] explicitly recognise the importance of teachers to achieving UPE [universal primary education]'.

2.3.5 Quality assuring teacher education and development

Many research studies have exposed shortfalls in the curriculum offered by teacher training institutions that could be improved if better regulatory mechanisms were in place. Identified needs include: developing future teachers' pedagogical knowledge (Tatto et al., 2012); increasing access to classroom experiences (Pryor, Akyeampong, Westbrook & Lussier, 2012); increasing training in assessment methods (Gove & Cvelich, 2011); developing skills in how to support learners from diverse backgrounds and with special needs (Blömeke, 2012; Nguyet & Ha, 2012); providing trainees with experience of a variety of teaching methods and strategies, developing skills in using activity-based teaching methods that engage students (Akyeampong, Pryor, Westbrook & Lussier, 2013); and providing training in how to teach pupils to read.

A study carried out in Mali found that:

> Teachers had been inadequately prepared to apply the required teaching methods and did not give sufficient attention to supporting pupils' individual reading. This is no doubt an important reason why nearly half the pupils in Mali cannot read a word in their own language at the end of Grade 2. *(Varly, 2010 cited in UNESCO 2014, p. 238)*

The example of Mali also draws attention to problems regarding languages of instruction. In Senegal, for example, where attempts are made to use local languages in schools, teacher training is given only in French, and a survey found that only 8 per cent of trainees expressed

any confidence that they could teach reading in local languages (Akyeampong, Pryor, et al., 2013).

2.3.6 Policies to build capacity of school leaders and classroom teachers to deliver high-quality teaching and learning

The challenge in developing policy that builds the capacity of school leaders and classroom teachers in developing countries is that many systems work within a paradigm where teachers are not trusted to assume professional responsibility for their own learning. Lack of trust is exacerbated in systems where teachers have low status, are poorly paid and inadequately trained. This lack of professional status and trust of teachers has encouraged inefficient system-led approaches to capacity building that rely on outside experts to 'give inspirational lectures, report the latest research findings and introduce new techniques and strategies' (Feiman-Nemser, 2001, p. 1041).

Building the capacity of teachers and school leaders to improve teaching practice and student learning requires that systems invest in more than supplying teachers with 'in-service' training and expecting their compliance with pre-determined strategies and outcomes as instructed. Progress in this area requires a new paradigm that recognises the importance of providing sufficient support, resources and infrastructure to ensure follow-up, continuity and sustainability, so teachers and school leaders can collaboratively enhance their own knowledge and skills within supportive learning environments.

2.4 Developing country experience compared to policy lessons

This section provides examples of developing countries where policies have been implemented that align with the policy lessons described at the beginning of this chapter.

2.4.1 Attracting talented people to a career in teaching through adequate compensation, working conditions and status

Indonesia: In 2005, the Indonesian Government passed a law that aimed to establish a 'certification' mechanism to ensure teacher quality. The law required a teacher to have a college or university degree, credits from post-graduate teacher professional training, and a minimum of 24 hours teaching per week to become certified.

Attached to certification was an important salary incentive—a certified teacher would be entitled to an annual amount equivalent to his or her base salary (essentially a doubling of income). This is a significant government investment, given that teacher salaries are currently the largest expense of the Ministry of Education and Culture (Cerdan-Infantes, Makarova, Al-Samarrai & Chen, 2013).

Competition for highly qualified people among employers in Indonesia is significant given the limited numbers of highly qualified people available. It appears that the salary incentives attached to certification, as well as the improved levels of teacher knowledge and skills, make the profession a competitive option for talented graduates. The pay gap between teachers and other workers with the same level of qualifications is narrowing in Indonesia. 'It is estimated that the wage rate set in the law will be able to increase the share of teachers among the entire college-educated labor force from approximately 16 to 30 per cent' (Chen, 2009 cited in World Bank, 2010, p. 9).

An indication that teaching has become a more attractive profession is that teachers colleges and universities are experiencing considerably increased enrolment (World Bank, 2010). The number of students enrolled in education programs in Indonesia increased from 200 000 in 2005 to more than 1 000 000 in 2010 (Chang et al., 2013, p. 99). In addition, approximately

500 000 teachers are enrolled in education programs at the Open University (Chang et al., 2013, p. 100). The outcomes related to teachers are: increased numbers of qualified teachers; increased knowledge of teachers; and changes to teacher behaviour. There are estimated learning gains for students due to the teacher upgrading process although there has been no impact yet in international PISA scores.

Cambodia: Evidence from World Bank research indicates that teacher compensation in Cambodia is attractive. Although starting salaries are uncompetitive, at less than 50 per cent of gross domestic product per capita, teacher pay can change moderately over a teacher's career. The salary schedule varies based on the results of teacher performance evaluations and there are incentives for teachers who teach in hard-to-staff schools or certain geographic areas. Teachers are also entitled to retirement benefits. Salaries are reliable, with salaries paid on time 10 months or more every year. In addition, working conditions for primary teachers in Cambodia are attractive (World Bank, 2011, p. 3).

Egypt: The government of Egypt has recently introduced a requirement that prospective teacher trainees have strong performance in secondary school as well as a favourable interview assessment. If they successfully meet these requirements, candidates must also pass an entrance examination to ensure they match the profile of a 'good teacher' (World Bank, 2010, cited in UNESCO, 2014, p. 234).

2.4.2 Requiring all teachers to have tertiary level academic and education qualifications

Indonesia: In passing the Teacher Law in 2005, the Indonesian Government intended that by 2015 only 'certified' teachers would be allowed to teach (World Bank, 2010, p. 8). The Indonesian Ministry of National Education has made sustained efforts to create structures and encourage the cooperation of stakeholders, including universities, provincial and district education offices, schools and teachers, to make certification a reality. Modifications have been made, and progress has been uneven, but the impetus continues (World Bank, 2010, p. 8).

2.4.3 Recruiting and selecting high-quality teachers

Indonesia: There is evidence to suggest that due to teacher reform in Indonesia, new graduates attracted to a career in teaching are better educated than previous graduates. Comparison between primary teacher candidates and the total population of senior high school students on national exit examination scores shows that the average score of primary school teacher candidates is higher than the national average and that new cohorts tend to increase at a faster rate than the national average (Chang et al., 2013, p. 101).

China: In China in 2007, the government established the Free Teacher Education Programme to recruit teachers to work in remote schools. The government offered high-performing students at the best universities incentives to return to their home provinces to teach. Student teachers in this program did not have to pay tuition fees. They also had 10 years of job security teaching in their home or other rural communities. Even if a graduate found employment in an urban area, he or she had to complete two years teaching in a rural area first (Wang & Gao, 2013).

Through this initiative, high-performing school students from rural areas were offered a free education at one of six prestigious normal universities on the proviso that they agreed to teach in their home province for a minimum of 10 years after graduation. Students who applied were exempt from all fees and costs of training, including tuition and boarding fees.

In a paper presented at the annual meeting of the 54th Annual Conference of the Comparative and International Education Society, Chicago, Fu argued that on the basis of data collected and

analysed from the six universities involved in the program, the effectiveness of the policy in improving the quality of teaching was limited by a national lack of 'more comprehensive measures and policies'. Yet the Free Teacher Training Programme was described as 'the most important educational policy related to teacher quality in recent years in China' (Fu, 2010).

Mozambique: The Ministry of Education encouraged training colleges to adopt policies of affirmative action such as reserving a number of places for women students. As a result, the proportion of female education students rose to more than 50 per cent, and the numbers of female teachers in schools quickly increased (Beutel, Macicame & Tinga, 2011). This was, in one sense, a positive development, but it did not address the question of teacher quality. More success was achieved in South Sudan, where policies that led to supporting and working with girls already in secondary school (less than 1 per cent of all girls in that age group) to encourage an interest in teaching as a career was a strategy that worked well (Epstein & Opolot, 2012; Globalgiving, 2013).

2.4.4 Managing supply and demand

Eritrea: The Eritrea Government assigns teachers to the country's six regions and to schools strictly depending on student numbers. Young teachers at the start of their careers are sent to the most difficult schools.

Korea: Policies are in place in Korea to ensure that disadvantaged students have access to well-qualified teachers. Teacher hiring decisions are made at province or city level, with the highest priority given to disadvantaged areas. Teachers working in disadvantaged schools benefit from incentives such as smaller classes or increased stipends. Other incentives include safer housing (especially attractive to female teachers), bonus payments and 'hardship allowances' (UNESCO, 2014).

Indonesia: Based on the reforms in Indonesia, there was an acknowledged need to improve selection and screening processes in teacher training institutions. More candidates were entering the system than were needed in 2010 (World Bank, 2010). This meant that the selection process occurs after teachers have graduated from training and are seeking employment, with the result that only about half of teacher-training college graduates eventually gain employment in teaching. More rigorous selection at point-of-entry to training—as employed in high-performing education systems (e.g. Finland and Singapore)—would prevent wastage. It would also help lift training course standards.

In response to this situation, the Indonesian Government set an annual quota in 2013 of 40 000 teacher candidates to enrol at private and state universities. This policy was intended to match the number of student teachers admitted each year and the number of student teachers set to retire when that cohort graduates (Chang et al., 2013, p. 103).

2.4.5 Quality assuring teacher education and development

Vanuatu: In 2012, the Vanuatu Government signed an agreement with the University of the South Pacific to provide training to 651 primary and 420 secondary teachers who were working as teachers but had no teacher training. The training project is part of a wider initiative, initially funded by the Australian Agency for International Development (AusAID, now DFAT) to 'fast track' the training of untrained teachers in the Pacific Region (Pacific Islands Forum Secretariat, 2010). The Vanuatu program is delivered in partnership with the Vanuatu Institute of Teacher Education, the only teacher training institution in Vanuatu. It uses distance education technology to allow teachers to remain teaching in their schools while undertaking studies in subject content and pedagogy.

The University of the South Pacific has established policies, procedures and templates for the accreditation of its courses. The issues considered for accreditation include admission requirements, proposed courses (including assessments and pre-requisites), program structure and duration, requirements for practical experience, comparability with existing university programs, and regulations for and proposed resourcing of the program or course. In the case of the university's initiative to fast track the training of untrained teachers in the Pacific, special accreditation arrangements are in place to provide for an alternative pathway of training. Once untrained teachers have satisfied requirements for teaching skills and curriculum content, they become eligible to enter the Bachelor of Education degree program. The initial programs are the first part of a 'stair-casing' approach to facilitate access for untrained teachers to the Bachelor of Education program (Pacific Islands Forum Secretariat, 2010).

Pakistan: In recent years, Pakistan has recognised the need to provide ways of assuring the quality of teacher education courses offered by universities and other relevant providers. In 2005, the Pakistan Higher Education Commission—an independent institution of primary funding, overseeing regulating and accrediting higher education in Pakistan—established rules relating to all programs offered by universities. Any new program in teacher education is to be referred to the Council for the grant of accreditation (AusAID Pakistan, 2006).

The National Accreditation Council, established in 2006, plays an advisory role in assisting teacher education institutions in planning teacher education programs. In addition, a Body of Experts Learning Solutions was established 'to develop a framework to establish standards for a paradigm shift in teacher education' (AusAID, Pakistan 2006). Published in 2009, these standards 'define the requirements for specific and essential components of a teacher education program. They guide towards the detailed documentation of program and processes for accreditation' (National Accreditation Council for Teacher Education, 2009, p. iii).

Recognising the present research consensus that effective quality assurance at teacher education level will provide teachers of the calibre needed to improve student learning, the Preface to the National Standards for 'Accreditation of Teacher Education Programs', published in August 2009, states that:

> Teacher education in Pakistan is witnessing a visible change and concern for quality assurance and enhancement. Standards based education in general and teacher education in particular, is part of global movement of quality assurance. *(National Accreditation Council for Teacher Education, 2009, p. i)*

Malawi: In recent years, the Development Aid from People to People Malawi established four teacher education colleges in rural districts. Training programs incorporate the latest evidence-based principles for teacher education, such as integration of theory and subject content, and opportunities to apply teaching skills in practice. The 30-month cycle is subject to continuous evaluation, including graduate surveys comparing student perceptions of these courses with those of students from government colleges. The courses have not only increased numbers of graduate teachers available to work in rural areas, they have embedded principles of best practice for other colleges to emulate (UNESCO, 2014).

2.4.6 Measures to build the capacity of school leaders and classroom teachers for high-quality teaching and learning

Cambodia: Cambodia has introduced a number of policies to build the capacity of teachers and principals to deliver high-quality teaching and learning. Performance goals for teachers have been established and Cambodia's national curriculum informs teachers of required subject content that should be taught to students at different grades. In addition, national standards, or measurable indicators of learning, have been defined for what students should know and be able to do (World Bank, 2011).

Teacher performance evaluations are conducted regularly and are required for all teachers. Teachers are assessed on several criteria: attendance; knowledge of subject matter; compliance with the curriculum; teaching methods; student assessment methods; student learning; and class participation (World Bank, 2011). Policies to build the capacity of principals to support high-quality teaching and learning have been implemented through evaluations by local, sub-national, and national education authorities, including performance-based incentives and the explication of the role of principals as instructional leaders in policy (World Bank, 2011).

Chile: Chile is mostly focused on driving quality by monitoring teaching and learning, and developing a strong external accountability system. The system focuses on setting clear expectations for teachers. The Preferential Subsidy (*Subvención Escolar Preferencial*, implemented since 2008) provides economic incentives and pedagogic support to schools serving low-income students that reach agreed objectives.

Chile has improved its student achievement measure in the PISA international assessment over time. However, Chile's results remain below the OECD average, and further improvement may require that the country implements additional teacher policy reforms focusing on selection of candidates for teaching and provision of high-quality teacher professional development (World Bank, SABER, 2012).

2.5 Conclusions

This chapter identified the main policy lessons for reform that support teacher quality through teacher development. These policies have been identified in the literature from what works well internationally, however the extent to which they can be operationalised in developing countries is open to question. Context plays a determining role in policy development and implementation. For many reasons, it is not generally possible to simply transfer examples of 'good' policy and practice as identified in the literature across countries and contexts.

Policy responses most likely to be effective in developing country contexts include:

› Attracting **high-calibre students** to the education profession by providing compensation, working conditions and status for teachers that compare favourably with other professions.

› Ensuring that all **practicing teachers are qualified** with recognised credentials.

› Selecting teacher education and training candidates who have **high educational achievements and attributes**, such as communication skills, needed to become a high-quality teacher.

› Effectively managing **the supply of teachers** (through training entry requirements and deployment) considering current and future demand.

› Regulating the teaching profession to protect and guarantee **the quality of teacher development** from pre-service courses to continuing professional development by developing professional teaching standards for different career stages, including school leaders.

› Developing and applying measures that help **school leaders and classroom teachers** deliver high-quality teaching and learning.

Chapter 3: Pre-service education support

3.1 Introduction

This chapter addresses pre-service teacher education. It describes the characteristics of pre-service teacher education shown to be effective in producing high-quality teachers internationally and describes pre-service teacher education experience in developing countries.

As outlined in Section 1.3, pre-service teacher education programs prepare beginning teachers for classroom practice, whereas in-service programs enhance the skills of current teachers (Tatto, Nielsen, Cummings, Kularatna & Dharmadasa, 1993). This distinction is somewhat blurred in the case of developing countries where some governments engage in large-scale teacher upgrading programs (as in the case of Indonesia described in Chapter 2). In some countries, practising but unqualified teachers may receive the content of what is essentially a pre-service qualification. The pre-service and in-service distinction nevertheless remains useful, because each situation presents different challenges and opportunities to improve teacher development.

This chapter focuses exclusively on the characteristics and potential supports for enhancing the efficacy of pre-service teacher education in developing countries. Chapter 4 discusses training for practising teachers (who may or may not have a pre-service teacher qualification).

While pre-service education is a crucial element of teacher training, the need within developing countries to rapidly recruit and train large numbers of teachers to meet demand places a significant burden on this aspect of teacher development. Many teachers employed to meet rising demand for primary education have no pre-service training (Kunje & Stuart, 1999; Pandey, 2006) and high demand for teachers often precludes extended pre-service training. Teacher education in developing countries is thus challenged by the competing concerns of scale and quality: ensuring sufficient supply of teachers trained to meet education needs (including the Millennium Development Goals of EFA), while delivering pre-service teacher education programs that adequately prepare teachers for classroom practice and for enhancing the learning outcomes of students. The balance of training delivered to teachers through pre-service or in-service approaches requires careful consideration in specific country contexts, with reference to overall costs and the number of teachers required.

Contextual and policy-based considerations such as these reflect an inevitable overlap between this chapter and Chapter 2, as teacher education is not independent of the wider education policy context. This chapter emphasises the design and delivery of pre-service teacher education programs, but references relevant policy implications where necessary.

Our definition of pre-service teacher education programs is broad, encompassing programs of variable duration and structures designed to prepare teachers for primary or secondary school contexts. The range in structure, duration, content, costs, pedagogical approach and characteristics of applicants across different teacher education programs is immense. Initial pre-service teacher education may last anywhere from a few days to several years. Only some teacher education programs include opportunities for supervised teaching practice. The entry criteria for applicants to teacher training may vary widely, and the balance of course material dedicated to subject content, to pedagogy, to classroom management or teaching practice is also highly variable (Tatto et al., 1993).

Typical teacher preparation pathways used for preparing new teachers for classroom practice (as outlined in Chapter 2) may employ concurrent study of academic subjects and pedagogy,

training in pedagogy for students who already have an academic degree, and 'apprenticeship' or school-based training. In countries, such as Australia, where regulation of teacher education is high, accreditation standards for teacher education may specify minimum standards for specific program components (such as a minimum duration for classroom experiences, or requirements for the time devoted to learning discipline-specific content). This is not always the case, however, and in developing countries different approaches to teacher education may be evident, including little pre-service training in subject content or pedagogy, and few opportunities to practise teaching skills during training.

Many practising teachers in developing countries have low levels of school education, and it is less common for teachers to be trained at tertiary level compared with high-income countries (Avalos, 2000). Recruitment of teachers with minimal or no pre-service teacher education has a number of consequences. For instance, new teachers may lack opportunities to develop the content and pedagogical knowledge necessary to perform their role. There may be fewer opportunities for new teachers to receive mentoring from more experienced teachers, resulting in them developing their skills through 'trial and error'. Inexperienced and poorly trained teachers also tend to leave the profession at a higher rate than do their more highly skilled peers (Schwille et al., 2007).

Focusing on the quality of pre-service teacher education has tangible benefits in both better preparation of classroom teachers and flow-on effects in increasing the stability of the teaching workforce. Yet, of the different approaches undertaken to improving the quality of the teacher workforce in developing countries, pre-service teacher education has received relatively little attention (Zeegers, 2012). There are few detailed descriptions of initiatives to improve pre-service teacher education in developing countries, and those that do focus disproportionately on Africa.

The purpose of this chapter is threefold. First, to describe the characteristics of pre-service teacher education identified as important in producing high-quality teachers internationally. Second, provide an overview of the characteristics of pre-service teacher education in developing countries. Third, review the evidence for approaches targeted at providing support to enhance the quality of pre-service teacher education.

3.2 Characteristics of pre-service teacher education in high-achieving education systems

This section identifies factors linked to successfully producing high-quality teachers in high-achieving education systems. Even developed countries, where evaluation resources are plentiful and interest in the characteristics of effective teacher education is intense, understanding of good approaches to developing quality teachers continues has significant gaps. One review, for example, found that research evidence was scarce for the amount and type of content knowledge, pedagogical knowledge and school experiences required by beginning teachers (Wilson et al., 2001). Significant challenges exist in developing linkages between the education programs trainee teachers undertake and reported learning outcomes for the students they teach. In part, this is due to limitations in existing research (attributed to factors such as poor measurement, inappropriate research designs and potential to generalise from one context to another). It is also a function of the wide variation in structures of teacher preparation programs and the difficulties in establishing causality when many factors underlie student achievement.

Given the lack of conclusive research findings, research on pre-service teacher development generally focuses on identifying and describing the features of education programs known to produce high-quality teachers rather than assessing types of intervention. There are consistent patterns in research findings about pre-service teacher education (Box 2) and an emerging

consensus in the literature on the characteristics of teacher education programs known to produce effective teachers (Darling-Hammond, 2006).

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Box 2: Characteristics of teacher education programs known to produce high-quality teachers

1. Coherence, based on a common vision of good teaching grounded in an understanding of learning and permeating all coursework and clinical experiences.

2. A strong core curriculum, taught in the context of practice and grounded in knowledge of child and adolescent development, learning in social and cultural contexts, curriculum, assessment and subject-matter pedagogy.

3. Extensive, connected clinical experiences, carefully developed to support the ideas and practices presented in simultaneous, closely interwoven coursework.

4. Well-defined standards of professional knowledge and practice, used to guide and evaluate coursework and clinical work.

5. Explicit strategies, to help students confront their own deep-seated beliefs and assumptions about learning, and learn about the experiences of other people.

6. An inquiry approach that connects theory and practice—e.g. 'action research' and related approaches (which engages teachers in research and analysis of their own practice and includes cycles of reflection and improvement).

7. Strong school-university partnerships, to develop common knowledge and shared beliefs among school-based and university-based faculty, allowing candidates to learn to teach in professional communities that model state-of-the-art practice for diverse learners and collegial learning for adults.

8. Assessment based on professional standards, to evaluate teaching through demonstration of critical skills and abilities using performance assessments and portfolios supporting the development of 'adaptive expertise'. (Darling-Hammond, 2006, p. 276).

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Key features of this emergent consensus relate to the relationship between theoretical and practical learning, the quality of each component, and the clarity and consistency of standards expected within each component. Effective teacher education programs balance the knowledge and skills pre-service teachers acquire through their coursework and the practical skills they rehearse and develop during school experiences (Allen & Wright, 2013). For this reason, closer relationships between schools and teacher education providers can greatly enhance the quality of pre-service teacher training. Strengthening these relationships facilitates increased coherence of university and school-based experiences, and can reduce student perception of inconsistencies between practices advocated during training and practices modelled in the school context (Capraro et al., 2010).

While pre-service teachers are undertaking school experiences, opportunities to practise teaching under the guidance of an experienced teacher can greatly improve outcomes. These opportunities should allow pre-service teachers to progressively take more responsibility in the classroom and receive feedback on their teaching that enables them to develop their skills. In addition, and in the context of a coherent program linking theoretical and practical elements, school experiences should begin early in pre-service training (Levine, 2006), in environments similar to those teachers will experience once they are trained. Once again, however, compelling evidence of the impact of school experiences on teacher quality is lacking. It is generally recognised that opportunities for school experiences are important, but little research exists on the most important elements (Grossman, 2010).

High-quality school experiences rely on the quality of the mentoring and support received by students from supervising teachers (Clarke, Triggs & Nielsen, 2013). The role of the supervising teacher in pre-service teacher education is often neglected and there is significant scope to improve student experiences by ensuring students have access to experienced, high-quality supervising teachers, with the capacity to effectively mentor students (Greenberg, Pomerance & Walsh, 2011).

The design and delivery of high-quality teacher education programs are guided by explicit professional standards, which directly assess pre-service teacher knowledge and skills. Professional standards provide an expected level of professional knowledge and competence to be attained by graduating teachers.

3.3 Characteristics of pre-service teacher education in developing countries

Research on the type and effectiveness of pre-service teacher education in developing countries is scarce (Lewin & Stuart, 2003). Available evidence suggests that pre-service teacher education may rely on out-of-date, disjointed, incoherent curricula, with little integration of pedagogical content skills in initial training (Avalos, 2000; Lewin & Stuart, 2003). Teacher education curriculum may lack coherence, with distinct emphases on content knowledge and pedagogy, but little integration between fields of study (Kajoro, Chirure & Simiyu, 2013).

Pre-service teacher education in developing countries tends to be highly traditional, comprising a large proportion of lectures. It focuses on transmission of information with little exposure to a range of newer pedagogies (Hardman, 2011). Pre-service teachers have typically been exposed to similar models of teaching in their own schooling. These experiences, in conjunction with teacher education that models similar practices, make it challenging to introduce novel approaches to teaching (Schwille et al., 2007).

Examination of teacher education curricula in developing countries may show that they have been revised to incorporate features consistent with good practice from high-achieving education systems (Lewin & Stuart, 2003). With careful consideration to context, some general principles of effective pre-service teacher education (discussed in Section 3.2) may be highly relevant to supporting the development of pre-service teacher education programs in developing countries. In other cases, good practice principles for teacher education derived from extensive research on programs identified as producing high-quality teachers may have little utility in developing countries.

One of the few projects to describe pre-service teacher education in developing countries is Lewin and Stuart's (2003) Multi-Site Teacher Education Research (MUSTER) project which focused on initial teacher education in five countries in Africa and the Caribbean—Ghana, Lesotho, Malawi, South Africa, and Trinidad and Tobago. The findings of this research about who delivers the training, what curriculum they deliver and the way in which the curriculum is delivered have relevance to describing the opportunities for investment of educational aid. Selected findings from this research relevant to this chapter are described next.

Teacher educators may lack relevant experience and have limited autonomy

Very little attention has been paid to understanding the role of the teacher educator, or the competencies required for this role. There is rarely any career trajectory for teacher educators, specific qualifications, training or accepted performance standards (Celik, 2011; Koster, Brekelmans, Korthagen & Wubbels, 2005). For instance, most teacher educators at teacher training institutions in Niger had no training in the role of teacher educator (Goza, Kallekoye & Mounkaila, 2008). Working conditions for these teacher educators were extremely poor, with significant difficulties accessing teaching materials and appropriate teaching spaces, and very large classes of trainee teachers. Most teacher educators had low motivation for the role and expressed a wish not to be teaching at teacher training institutions. Direct observation of their teaching practices suggested that while half had good mastery of the content they taught, half had significant difficulties in acquiring the knowledge required to train prospective teachers (Goza et al., 2008).

In MUSTER countries, the process of recruiting, training and developing teacher educators was not transparent. In these countries, teacher educators often come from a secondary teaching background, which meant that primary teachers were being prepared by educators without primary teacher training or experience. Teacher educators were often constrained by educational systems and had limited autonomy or ability to promote change in the structure or practices of teacher education, which often resulted in discontent among educators (Lewin & Stuart, 2003).

Teacher education curriculum may be limited

Curriculum documentation in MUSTER countries was often incomplete, with unclear expectations about the skills to be developed during pre-service teacher education.

Teacher education curricula often did not take the characteristics of pre-service teachers into account, with curricula not designed to cater for the academic abilities of entrants. For instance, the profile of entrants was typically older (non-school-leavers), their academic background low, their achievement weak, their family background usually characterised by low levels of parental education, and their incomes generated from non-professional activities.

Often the curricula in these teacher education programs did not reflect the realities that beginning teachers would experience (e.g. large classes, multi-grade classrooms).

Approaches to teaching and assessment within the courses were often highly traditional (e.g. lecture-based to large classes, paper-based examinations) and allowed few opportunities for modelling the newer pedagogies and assessment practices sometimes described during the course (e.g. working in small groups). This issue was also compounded by the often conventional ideas that teacher trainees have about the teacher's role, which were based on transmission of knowledge and teacher-centred classrooms rather than on the need to incorporate newer approaches to teaching and learning (Lewin & Stuart, 2003).

Opportunities for practice teaching varied widely across MUSTER countries studied; from short blocks or teaching rounds as part of more traditional pre-service teacher training, to much more classroom-based training models. All models shared similar weaknesses: theory and classroom practice occurred relatively independently; relationships between teacher training institutions and schools were distant and on occasion not functional; opportunities for feedback from teacher educators were few, and assessments of teaching practice were of limited use to pre-service teachers in developing their skills (Lewin & Stuart, 2003).

Teacher training may not involve enough school experience

High-quality school experiences give pre-service teachers early and ongoing exposure to a range of school contexts throughout their training (Behrstock-Sherratt, Bassett, Olson & Jacques, 2014). School experiences for pre-service teachers in developing countries may be of relatively short duration, quite separate from coursework, and with minimal feedback or oversight by teacher educators or school-based mentors (Kajoro et al., 2013). Balanced against pragmatic considerations such as the high costs of school experiences, the challenges of providing pre-service teachers with meaningful school experiences are significant. There are often significant difficulties in simply obtaining sufficient schools for students to undertake supervised practice and ensuring a consistent quality of school contexts is challenging (Simpson, 2006). For instance, in Kenya, Tanzania and Uganda, pre-service teacher education programs provide short practical experiences in schools and in simulated classrooms. School experiences are ineffectively supervised and pre-service teachers may never complete the full school experience due to insufficient funding (Kajoro et al., 2013).

In the developing countries highlighted in a recent study (Ghana, Kenya, Mali, Senegal, Tanzania and Uganda), there had been substantial school curriculum reform, yet teacher education had not adapted to the new school curriculum and continued to teach outdated materials (Akyeampong, Lussier, Pryor & Westbrook, 2013). Beginning teachers graduated from these programs only to discover that their initial teacher education had prepared them poorly for the realities of the classroom. Thus, teacher education curriculum review has emerged as an approach to supporting pre-service teacher development in developing countries.

The above-noted study focused on describing the knowledge and skills of pre-service teachers and newly qualified teachers through self-report measures and direct observation. It highlighted areas for improvement of pre-service teacher education which may be applicable in other developing countries, as summarised in Box 3.

Box 3: Recommendations for improving pre-service teacher education programs in developing countries

- Develop coherent, intensive programs on teaching beginning reading that are closely aligned to the school curriculum and incorporate training in assessing reading.

- Develop similar intensive programs for teaching early numeracy.

- Introduce small group work between tutors and students.

- Provide developmental support to teacher educators.

- Integrate extensive exposure to the primary school curriculum, linked to real examples of student work to consider how to promote children's learning.

- Gain in-depth knowledge of local languages and learning how to teach reading in more than one language.

- Restructure school experiences so they occur earlier in the course, provide opportunities for mentoring, and work more closely with students (Akyeampong, Lussier, et al., 2013).

Pre-service teacher curriculum reform experience from Africa

Akyeampong, Lussier, et al.'s (2013) study affirms the importance of pre-service teacher education in shaping the approaches used by teachers in the classroom. Their review suggests the importance of thorough understanding of the context of initial teacher education as a first step in suggesting reasonable options for reform. They recommend three key reforms, outlined next, based on analysis of teacher education in five African countries. The reforms parallel the characteristics of teacher education programs known to produce high-quality teachers.

The first reform relates to updating and developing relevant *curriculum content*. Across the five African countries, pre-service training was rated as the most important context for learning how to teach reading and mathematics, yet the curriculum focused mostly on subject knowledge and very little on pedagogy. Much of the focus was on repeating the secondary school curriculum, which limited opportunity to develop pedagogical skills. Some entrants to pre-service teacher education in these countries had already completed senior secondary school, making the training repetitive. The focus on subject knowledge was reinforced by assessments (Akyeampong, Lussier, et al., 2013).

The second reform relates to reforming *curriculum delivery* to remove obstructions to innovation. Often pre-service training involved learning prescriptive teaching sequences which newly qualified teachers implemented and regarded as characteristic of a good lesson (Akyeampong, Lussier, et al., 2013). The teaching methods in teacher education programs were

primarily lecture-based in large groups, which allowed little time to observe or practise other teaching methods.

The third reform draws attention to the need to improve *the school experience component* of pre-service teacher education in these countries. It emphasises that school experiences were generally perceived as too short, disconnected from other aspects of training, and offered few relevant experiences. In Uganda, the large numbers of pre-service teachers allocated to schools reduced the opportunities available to trainees, while in Ghana and Mali, school experiences were scheduled at the end of the course, thereby limiting the ability of trainees to use their school experiences to inform their work at college. There was little available mentoring from more experienced teachers and visits from teacher educators were rare (Akyeampong, Lussier, et al., 2013).

While the Akyeampong, Lussier, et al.'s (2013) study suggests the need for improvement in the same three areas identified by Lewin and Stuart, the authors believe its findings also emphasises the importance of initial teacher education as a context for developing teacher skills and improving teacher quality. The teachers interviewed for this study highlighted the importance of the knowledge gained in their initial teacher education, regardless of subsequent in-service professional learning opportunities.

Consistent with these findings, a third study by Moon (2006), which analysed case studies of teacher education in Nigeria, South Africa and Sudan, highlighted three significant areas for reforming the provision of pre-service teacher education and developing new models of teacher education:

1. reforming curriculum through greater focus on equipping pre-service teachers with effective *pedagogical practices*

2. reconsidering the *time allocated* to initial teacher training (employing shorter periods of university or college-based training in conjunction with ongoing school-based professional learning)

3. making use of *new technologies* to update delivery practices for teacher education.

Moon contends that curriculum reform needs greater emphasis on equipping pre-service teachers with effective pedagogical practices. To meet the demand for classroom teachers, shorter initial training periods, in conjunction with ongoing teacher development, are preferred. The rapid expansion of, and access to, new technologies may provide an avenue to increase access to and the quality of pre-service teacher education. Given the consistency of recommendations of the most relevant studies in this area, these three areas of reform are developed further in the next sections. Section 3.4 explores additional research on pre-service education, expanding on the three areas identified by Moon.

3.4 Evidence of effective approaches for improving the quality of pre-service teacher education

This section describes a selection of interventions focused on providing developmental support to pre-service teacher education. While evidence for the effectiveness is scarce, this research provides insights into the challenges and opportunities of implementing pre-service teacher education improvements in developing countries.

3.4.1 Reform the teacher training curriculum for effective pedagogical practice

A central consideration in curriculum reform is identifying pedagogical practices most likely to be effective for teachers in developing countries, and thus the type of knowledge, skills and

abilities teacher education should foster. A large study of data gathered for the Southern African Consortium for Monitoring Educational Quality highlighted the importance of having trained teachers with high levels of subject matter knowledge and mastery of pedagogical practices in influencing students achievement in mathematics (Duthilleul & Allen, 2005). Similar findings affirm the importance of these aspects of teacher quality to mathematics and languages (Tatto et al., 1993).

In a recent review, Westbrook et al. (2013) synthesised evidence from developing countries on the effectiveness of pedagogical practices (sub-Saharan Africa comprised the majority of Westbrook's studies, followed by India, with a small number of studies from other locations such as East and Central Asia). The authors identified three strategies used to good effect by teachers: teachers providing feedback and fostering an inclusive classroom where all students received attention; developing and maintaining a safe classroom environment; and integrating students' backgrounds into teaching. Westbrook et al. (2013, p. 37) identify six practices across the literature emerging from these strategies, which show evidence of positive outcomes.

› Demonstration and explanation drawing on sound pedagogical content knowledge

› flexible use of whole-class, group and pair work where students discuss a shared task

› frequent and relevant use of learning materials beyond the textbook

› open and closed questioning, expanding responses, encouraging student questioning

› use of local languages and code switching (the use of more than one linguistic variety in a manner consistent with the syntax and phonology of each variety)

› plan and vary lesson sequences.

From the relatively small number of available studies, Westbrook et al. (2013) identified characteristics of teacher education that supported the development of these practices, which could be central to curriculum reform. These included ensuring that pre-service teacher education aligned with teacher needs, ongoing teacher development and school curriculum. In contrast, difficulties arose where these aspects were not mutually reinforcing (for instance, when the curriculum or classroom context did not support these practices). Further supporting factors included: making available teacher manuals with scripted lessons; ensuring teacher educators are trained to understand and model pedagogies; and providing mentoring and support when pre-service teachers had opportunities to practice in classrooms (Westbrook et al., 2013).

3.4.2 Develop teacher educators

Teacher education is central to reform. Sustainable change is more likely achieved by involving teacher educators and colleagues in the process and working to further develop their collegiality and maintain their autonomy (Aypay & Sezer Kalayci, 2008). Effective and knowledgeable teacher educators are central to effective pre-service teacher education (Avalos, 2000; Kajoro et al., 2013; Westbrook et al., 2013). Yet the role of the teacher educator has received scant attention and little is known of teacher educators' role in modelling teaching practice to their students (Korthagen, Loughran & Lunenberg, 2005; Lunenberg, Korthagen & Swennen, 2007).

In the Philippines, Zeegers (2012) reported on the lessons learned working with teacher educators to build their capacity to undertake curriculum review—that is a process of analysis and revision of existing curriculum to a set of reform standards. This was, however, challenged by limited up-to-date and relevant resources, lack of teacher educator experience with undertaking curriculum review and revision, different teaching and assessment methods introduced into teacher education curricula, and limited time of teacher educators for the project. The project's team of teacher educators were assisted to develop the skills necessary to

undertake curriculum review and then take responsibility for conducting further professional learning among their colleagues. Ensuring that teacher education institutions had access to the Philippine's Basic Education Curriculum was fundamental as was ensuring that programs incorporated the national curriculum when training teachers. Teacher educators built capacity throughout their review process, identifying educational learning requirements and asking for further development so they could develop the curriculum (e.g. authentic assessment) (Zeegers, 2012). Building the capacity of teacher educators was regarded as central to curriculum review. Involving teacher educators and a cross section of others from administering institutions was central to the project's success and to sustainable practices.

3.4.3 Tailor initial teacher training to meet short-term and long-term requirements for teacher quality and quantity

As discussed, the pressure to maintain or expand the teaching workforce in developing countries requires alternative approaches to pre-service education that adequately prepare beginning teachers for the classroom while maintaining time and cost efficiency (Kunje, 2002). Two strategies for this are increasing the number of trained teachers by improving access to training programs and reducing the time required to qualify as a teacher (e.g. Guyana: Improving Teacher Education, The World Bank, 2010–15), and exploring alternate certification approaches that shift the balance of training dramatically to a school-based, in-service model (e.g. Malawi integrated in-service teacher education program (MIITEP), Kunje, 2002).

The Guyana Improving Teacher Education Project supports the delivery of a new Bachelor of Education which can be completed in four, rather than seven, years. The Cyril Potter College of Education has introduced a new, two-year compulsory Associate Degree in Education which can be followed by two more years of (non-compulsory) study at the University of Guyana. Before this was introduced, initial teacher training in Guyana comprised three years of study at the Cyril Potter College of Education for a Trained Teacher Certificate and four more years of study at the University of Guyana for a Bachelor of Education (Yang, 2014).

The Guyana Improving Teacher Education Project provides technical assistance to revise the curriculum and develop new courses to upgrade the syllabus, ensure that the curriculum is not repetitive and overloaded, respond to the needs of Guyanese teachers, and comply with quality requirements. In addition, the project provides training to lecturers from the Cyril Potter College of Education and University of Guyana to ensure they can deliver the curriculum under the new structure (Yang, 2014).

Malawi's MIITEP presents an extreme approach to generating a sufficient supply of teachers. It represents a shift in balance away from university or college-based training to a short, intensive residential period in college (three months), followed by 20 months of supervised teaching practice and associated coursework completed by distance education, and a final one-month course review and final examination (Kunje, 2002).

Evidence suggests that while the MIITEP is rapidly increasing the supply of trained teachers, significant issues are affecting the quality of training and likely outcomes for teachers. The outcomes also suggest barriers to implementation (Kunje, 2002). For example, many applicants came from low academic backgrounds, the balance of training between subject knowledge and pedagogy was unresolved, and there was a significant gap in providing appropriate support to candidates during their school experiences. The distance element of the course suffered from infrastructure problems and a resulting lack of collaboration and feedback. Handbooks produced for the course were, however, used extensively and were useful to teachers other than those enrolled in the course. In some cases, evidence was that head teachers and primary education advisors provided high-quality training and support to trainee teachers.

Planning for shortened pre-service teacher education programs cannot occur without consideration of the broader issues in teacher development. For instance, shortened initial training is unlikely to be effective where education levels of pre-service teachers are very low. Shortened pre-service training models are also unlikely to promote teacher quality unless ongoing high-quality in-service training for teachers is available (Marphatia, Legault & Archer, 2010). Flexible options might include different levels of training according to the characteristics of entrants.

3.4.4 Use new teacher education delivery modes if capacity is available

Various forms of distance education approaches to pre-service teacher education have emerged as an attempt to cost effectively train classroom teachers and provide ongoing teacher development in high and low-income countries.

While seeming to have most value in upgrading the qualifications of existing teachers, distance education is also being increasingly used to train new teachers (Robinson, 1998). For instance, in Sri Lanka more than 20 years ago, Tatto et al. (1993) compared the outcomes for:

› New teachers undertaking pre-service teacher education through colleges of education. This program comprised two years of coursework and a one-year internship. Entrants were high-quality, high school applicants.

› Current teachers upgrading their qualifications through distance education. This in-service model lasted three to five years, with entrants generally less educated than college undergraduates.

› Current teachers upgrading their qualifications through teachers colleges. As with distance education, these entrants generally had lower levels of secondary school education and mixed years of teaching experience ranging from 0–10 years. This model required two years of coursework.

The study compared the three education programs (pre-service teacher education through colleges of education, upgrade current teacher qualifications through distance education and upgrade current teacher qualifications through teachers colleges) using measures including teacher assessments in mathematics and language for mastery of content and pedagogy, classroom observations of teaching skills, and student achievement in mathematics and language. As explained earlier, the structure of each program and profile of entrant to the three types of education programs was quite different.

Tatto et al. (1993) found that on some measures the outcomes for distance education and in-person training were comparable. Classroom performance for pre-service trained teachers was similar to that of teachers who had received distance education training. Students taught by teachers trained by any of the three education programs achieved better results in mathematics and languages compared with students taught by untrained teachers.

On other measures the outcomes were different. In-person training achieved better outcomes than did the distance mode. Teachers who had received pre-service training though colleges of education achieved more highly in mathematics knowledge and skills, as well as in language knowledge, than did teachers trained through in-service approaches. Students taught by teachers who had undertaken pre-service education or in-service education through teachers colleges, tended to achieve more highly than did students taught by teachers who had undertaken distance education.

When considered as an option for implementation, these findings need to be balanced against program costs. The distance model was highly cost-effective while face-to-face, pre-service education had low cost effectiveness. However, the rapid improvement of teacher skills under the pre-service face-to-face model and the maintenance or improvement of skills in the first

year of practice suggests that, over the long-term, the pre-service model may become more cost-effective (Tatto et al., 1993).

Robinson's (1998) review suggested that, under certain circumstances, distance education for teacher training (including pre-service teacher education) can increase access to training, with good outcomes for teachers. Robinson balances this conclusion against the large variation in program characteristics and structures that, like conventionally delivered programs, can easily change the quality of outcomes. At the time of Robinson's review, there was little evidence on teacher practices or student learning outcomes to conclusively determine the usefulness of distance education approaches to pre-service teacher education.

Nonetheless, Robinson suggests that poor quality teacher training through distance education may be the result of factors that appear to apply to distance education and more generally to teacher education delivered through other approaches. These factors are:

› deficiencies in the infrastructure needed to support distance education (such as communications and transport)

› weak planning, inadequate input from specialists and/or not enough preparation time for establishing programs

› under resourcing, perhaps because of unrealistic expectations of cost savings by policy makers

› weak management

› poor quality materials

› acceptance of low standards

› inadequate training of staff or the frequent redeployment of trained staff to unrelated posts

› inadequate support to student teachers at local level

› operational failures in distance learning systems (in the sub-systems for materials production, delivery, assessment, student administration and support services)

› lack of incentives or rewards to teachers for successful course completion

› conservatism (sometimes entrenched) of teacher educators and planners

› lack of policy backing at high levels and in significant policy documents (Robinson, 1998, pp. 134–135).

3.5 Conclusions

The evidence reviewed in this chapter highlights how to effectively support pre-service teacher education in developing countries. The research literature in the area is not extensive, but some guidance on effective interventions can be derived from the characteristics of pre-service teacher education programs known to produce high-quality teachers, and the review of selected case studies from developing countries. This guidance includes the need for:

› Supporting pre-service teacher education that will most likely be effective in developing country contexts, such as by improving the curriculum for pre-service teacher education courses so they focus on beginning teacher needs by including pedagogical practices (e.g. use of demonstration, questioning, and learning materials beyond the textbook) and knowledge of the school curriculum. Such curriculum reform needs to be integrated with improvements to teaching practices in schools.

› Training for teacher educators to equip them to deliver the curriculum, become agents of change in curriculum review, and model effective pedagogical practices.

› Facilitating linkages between teacher education providers and schools so collaborative partnerships can develop for the preparation of pre-service teachers.

› Supporting colleges and universities to develop flexible approaches to pre-service teacher education (such as shorter courses and flexible options, including distance education if appropriate) which balance the need to rapidly increase the supply of teachers with the need for quality training. Access to technology may assist if the system can support and maintain it.

› Providing pre-service teachers with more opportunities to spend time in classrooms where they can be mentored by effective teachers.

Chapter 4: In-service teacher development support

4.1 Introduction

This chapter examines in-service teacher development support. It describes the characteristics of high-quality teacher development for practising teachers internationally. It discusses barriers and enablers of effective in-service professional learning for teachers in developing countries, and reviews the evidence on approaches to school-based support.

Teacher development has been seen as a process which, at best, prepared teachers through a relatively brief period of initial teacher education followed by short and infrequent in-service courses. Such courses were usually designed to upskill teachers in areas of curriculum or curriculum delivery related to the education policies of the time. Towards the end of the 20th Century, as the strength of teacher influence on student learning became apparent, and as the need to prepare young people to work in competitive 'knowledge economies' grew, mass education systems in the developed world turned attention to the quality of school education and quality of the teachers who provided such education. Questions were asked about what teachers should know and be able to do, how they could be developed, and how systems might encourage, monitor and assess that development.

Following the work of researchers like Lee Shulman in the United States, the notion of a 'knowledge base' for the teaching profession akin to those of other professions, such as medicine and law, gained currency. The realisation that teaching was a complex endeavour that required a professional lifetime of learning led to programs and systems calling for rigorous and often extended periods of initial teacher education, followed by continuing professional growth through dedicated, long-term programs and learning systems. Such programs and systems often call for the mastery, over time, of teaching standards that clarify the teaching knowledge base and direct teachers towards areas in which they need to improve (Ingvarson & Kleinhenz, 2006). Increasingly, professional development of teachers is regarded as a long-term process of growth facilitated through regular opportunities to promote learning (Villegas-Reimers, 2003).

Chapter 2 of this literature review discussed the policy challenges of rapidly expanding the teaching workforce in developing countries to meet the Millennium Development Goal target of universal primary education. The immediate need to increase the supply of teachers has precluded long periods of pre-service training for new teachers and many developing countries have, as a result, recruited untrained teachers to meet demand. Ongoing in-service teacher development thus serves the dual purpose of continuing to develop trained teachers and providing opportunities to upgrade the skills of untrained or undertrained teachers.

Overall, access to teacher development support for practising teachers in developing countries is limited, especially in remote areas (VSO, 2002). Research undertaken by the VSO (2002) in Malawi, Papua New Guinea and Zambia showed that where a focus on teacher development existed, the majority of resources were directed towards upgrading the qualifications of existing teachers. Access to teacher development aside from such upgrading has been poorly resourced and difficult to access (e.g. Tanzania in Komba & Nkumbi, 2008). Most teachers in a study of six African countries (Akyeampong, Pryor, Westbrook & Lussier, 2011) had no access to in-service teacher development.

In addition to these limitations, there are significant challenges in designing ongoing professional development opportunities because of the wide variation in the knowledge and skills of practising teachers: from untrained teachers who may need access to fundamental skills to those who may have several years of pre-service teacher education.

As outlined in Chapter 3, research suggests that well-designed teacher development has the potential to upgrade the skills of teachers in the workforce (Ingvarson, Meiers & Beavis, 2005). The potential benefits are bigger in developing countries with high proportions of untrained or poorly trained teachers.

The literature reviewed in this chapter builds on the discussion relating to pre-service teachers and highlights the consensus on the attributes of high-quality teacher development for practising teachers. This chapter also considers what might facilitate effective provision of in-service teacher development in developing countries, including through school-based support, and discusses possible challenges to implementation.

4.2 Characteristics of effective professional learning for teachers

The research literature describing the characteristics of effective professional learning for teachers is significant. Several sets of principles of high-quality teacher development have been developed which provide overlapping recommendations for the content and structure of teacher professional learning. This section explores the principles of high-quality teacher professional learning (Hawley & Valli, 1999, 2000) and describes research drawing common principles from a range of influential studies.

Hawley and Valli's (1999) design principles (Box 4), extracted from a range of research, synthesise common features of teacher development seen as important to student learning.

Box 4: Design principles of high-quality professional learning for teachers

Teacher professional development should:

1. Have content that focuses on what students are to learn and how to address problems students may have in learning.
2. Be based on analyses of the differences between goals and standards for student learning and actual student performance.
3. Involve teachers in identifying what they need to learn and developing their learning experiences.
4. Be primarily school-based and built into day-to-day teaching.
5. Be organised around collaborative problem solving.
6. Be continuous and ongoing, involving follow-up and support for further learning, including support from sources external to the school that can provide necessary resources and new perspectives.
7. Incorporate evaluation of multiple sources of information on learning outcomes for students and on how to improve professional development in light of experience.
8. Provide opportunities to gain an understanding of the theory underlying the knowledge and skills being learned.
9. Be connected to a comprehensive change process focused on improving student learning.

Variations on Hawley and Valli's (1999) characteristics of effective teacher development yield largely complementary consensus statements. For instance, Ingvarson, Meiers and Beavis (2005) synthesised a range of research literature and identified five features of high-quality teacher development. They suggested that effective teacher development has a content focus, provides opportunities for active learning, provides feedback on teaching, involves collaborative examination of student work, and provides follow-up for teachers in schools. These researchers found that these five features, which mirror Hawley and Valli, were common to most examples cited in the literature as good practice in teacher development.

Moreover, Ingvarson et al. (2005) found that the five core features of effective teacher development they identified were rated most highly by teachers. At the same time, the

researchers noted that few of the programs incorporated their core feature of *feedback on teaching*, or follow-up for teachers in schools, despite significant benefits for teachers when teacher development incorporated these features. Such features (i.e. ongoing feedback and follow-up for teachers in their schools) have significant resource implications for teacher development and create a dilemma between developing a high-quality program and maintaining access for large numbers of teachers.

Evidence suggests that teachers' self-reported changes in knowledge, skills and classroom practice are positively associated with features of high-quality teacher development. For instance, Garet et al.'s (2001) study showed that teachers who participated in longer professional development activities over extended periods rated the impact of these activities more highly on opportunities for active learning (such as observing and being observed teaching) and for coherence with other aspects of their work (including connections to their goals and experiences). Meanwhile, a focus on developing content knowledge was positively associated with developing teacher knowledge and skills, which, in turn, was positively related to changed-teaching practice.

As noted in previous chapters, however, there is very little direct research evidence for the impact of teacher professional development on changing teacher practices or improving student learning outcomes (Garet, Porter, Desimone, Birman & Yoon, 2001; Yoon, Duncan, Lee, Scarloss & Shapley, 2007). Recent research (Glewwe et al., 2011), which reviewed a small number of high-quality studies focused on the impact of in-service teacher training on student learning, suggested a moderate impact. Yoon et al. (2007) also identified a positive effect on student learning outcomes of in-service teacher development across a small number of studies (Yoon et al., 2007). In this study, a greater effect was shown for sustained professional learning (more than 14 hours in duration), while short duration professional learning (five to 14 hours) showed no effect on student learning (Yoon et al., 2007).

It is reasonable to expect that students' learning will improve if teachers change their practice for the better and improve their content knowledge (Wei, Darling-Hammond, Andree, Richardson & Orphanos, 2009). Evidence for this assertion is not direct, however, highlighting the complexity of the relationship between teacher development and student learning outcomes. Few studies have taken a longitudinal perspective on modelling the relationship between teacher development and student learning outcomes (Desimone, Porter, Garet, Yoon & Birman, 2002; Mayer & Lloyd, 2011).

4.3 Opportunities and constraints for supporting in-service teacher development in developing countries

This section reviews four key issues in providing teacher development opportunities for practising teachers in developing countries: (1) resources are required for high-quality teacher development; (2) effective teacher development occurs in teachers' own schools or clusters of schools; (3) learner-centred pedagogies; and (4) well-qualified teacher trainers. Barriers and facilitators are identified for each key issue.

Substantial resources are required for high-quality teacher development

As noted previously, the realities of teaching in many developing countries create challenges for the provision of teacher development. Often the lack of sufficient resources is a major impediment to classroom teaching. Where such resources are lacking, it is likely that initiatives to encourage ongoing teacher development will be hampered. The relationship between high-quality teaching and the quality of the physical classroom environment and available teaching resources has been noted by many researchers. For instance, Urwick and Junaidu (1991) observed a close relationship in Nigeria between the availability of textbooks, furniture and

other resources in the classroom and the degree to which teachers adopted learner-centred approaches, used a variety of activities and forms of communication, and set individual work for students. Likewise, O'Sullivan (2004) noted that the resources for implementing learner-centred instruction in Namibian classrooms, such as textbooks, space and small classes, were not available in schools.

Effective teacher development occurs in teachers' own schools or clusters of schools

It is widely known that the most effective forms of in-service teacher development occur in teachers' own schools or clusters of schools. Teacher development that occurs independently of the school context and without ongoing support for implementation may be challenged by the realities of the classroom environment and lack of understanding among teaching colleagues and the school leadership. For instance, researchers in Pakistan (Mohammad & Harlech-Jones, 2008; Mohammad, 2004) found that teachers who had undertaken an in-service training course at a university (focused on mathematics) did not immediately implement the practices they had learned. A number of challenges were evident both in teachers learning new skills and changing their teaching practices in the school context.

The practices taught during in-service training were often difficult to implement due to time constraints and other responsibilities (Mohammad, 2004). Teachers were pressured by a school culture that valued traditional approaches to teaching and were concerned they may be negatively evaluated if they deviated from accepted routines (Mohammad, 2004). By implementing school-based support from a teacher educator for the teachers, the authors demonstrated the value of professional conversations and support in encouraging teachers to implement changes in their practice (Mohammad & Harlech-Jones, 2008). To be successful in this task, teacher educators need to understand the school environments in which teachers will teach so they can support teachers to implement the skills taught during training (Mohammad & Harlech-Jones, 2008).

Learner-centred pedagogies are important

A major focus of government and donor interventions to improve teacher quality in developing countries has been efforts to introduce different pedagogical practices that shift the focus from traditional teacher-centred, transmissive pedagogies to learner-centred practices (Schweisfurth, 2011). Such efforts span the continuum of teacher development outlined in the two previous chapters, because they can be implemented at any level. Evidence related to the success of such initiatives is outlined in this section.

In 2011, Schweisfurth synthesised the evidence from a range of studies focused on efforts to increase the use of learner-centred teaching practices in developing countries. She suggested there are challenges to introducing learner-centred pedagogical practices in developing countries. These broadly comprise: unrealistic expectations of the impact of learner-centred education and the ease with which teachers can adopt new practices; poor working conditions and lack of physical resources to support implementation; lack of consideration of the cultural context; and lack of consideration of how learner-centred initiatives fit into the broader education system.

An increased focus on learner-centred practices to teaching was embedded in the Gansu Basic Education Project (1999–2000) in China supported by DfID from the United Kingdom. These practices were incorporated into teacher training with teacher educators given greater exposure to the practices and supported by ongoing in-service support. They were just one part of a complex and extensive program of upgrading teacher qualifications, training new teachers and teacher educators, and focusing on developing school capacity (Brock, 2009). Projects such as this one, and many others, have occurred in the context of widespread efforts by the

Chinese Government to reform its education system. However, insufficient support to teachers and an expectation that they can easily implement teaching practices at odds with traditional methods (and those they had experienced as students) can result in not adopting the practices, or having incomplete understanding or misunderstanding about applying them in the classroom (Dello-Iacovo, 2009; Todd & Mason, 2005). A similar outcome was reported by O'Sullivan (2004) in Namibia where teachers had difficulties understanding the language of learner-centred instruction presented in in-service training and found it difficult to reconcile a view of the learner that contradicted accepted social and cultural expectations.

In the context of efforts to develop learned-centred instructional practices in an in-service context, O'Sullivan (2004) found that adapting training content to take into account teachers' skills and the realities of their school context clarified the meaning of the content for teachers. Teachers in Namibia undertook the in-service program to introduce learner-centred approaches (to support a learner-centred curriculum) to unqualified and underqualified teachers. As previously outlined, teachers in the program initially had difficulty in understanding and implementing these practices. Importantly, the in-service program was adaptive, with learning from teachers' attempts at implementing learner-centred practices used to modify training. Moreover, classroom observations suggested that teachers had begun to integrate these practices into their classroom and reduce reliance on rote methods of learning. O'Sullivan (2004) reported growth in students' reading skills over a two-year period; however, in the absence of specific controls for other factors likely to influence students' development, the influence of teacher in-service training remains unclear.

Well-qualified teacher trainers are required

The delivery of high-quality professional learning to teachers is largely dependent on the skills of trainers. Trainers in the teacher centres in India, Kenya, Nepal and Zambia had little specialised training in the role, or had competing responsibilities (Knamiller, 1999). In-school support to reinforce the training received at teacher centres was also a feature of most teacher centre projects to varying degrees (Knamiller, 1999). In practice, the support had varying impacts because trainers had difficulty meeting the need to conduct follow-up visits to schools, or in-school support did not involve direct classroom support. In Kenya, Nepal and Zambia, staff from the teacher resource centre also played a role in schools; however, because this role was ill-defined there was little evidence of change in teacher practice.

These general conclusions parallel recommendations for good practice in in-service teacher development in developing contexts more generally. A recent review of the literature undertaken in the development phase of in-service teacher development in Cambodia presented the recommendations for designing teacher development in developing countries shown in Box 5 (Courtney, 2007, p. 323). One weakness identified was programs developed by external agencies and not assessed for suitability to local contexts. A further weakness with the provision of in-service teacher development was when delivery methods were inappropriate and the focus was on the time spent in the program rather than on its quality.

4.4 In-service teacher development approaches that align with the characteristics of effective professional learning

This section provides six examples of in-service teacher development approaches aligning with the characteristics of effective professional learning for teachers while responding to the critical issues raised in Section 4.3. Five examples are from developing countries. These examples may be of use to other practitioners in developing countries considering what approaches to apply in their context.

Example 1: Lesson study in Japan and China

In Japan, the principles of professional development that have been created mainly in Western countries following the work of Hawley & Valli (1999), as noted in Section 4.2, have been extended into a model known as *jugyokenkyu*, 'lesson study'. Lesson study is a major part of *konaikenshu*, professional development. It brings together the entire teaching staff of a school to work in a sustained and focused manner on a school-wide goal that all teachers have agreed is of critical importance to them (Fernandez & Yoshida, 2004). Schwille et al. (2007) refer to a number of websites, list serves and videos, books and short articles that help English speakers understand this movement (e.g. Bass, Usiskin & Burrill, 2002; Fernandez, 2002; Lewis, 2002; Lewis, Perry & Murata, 2006)

In China, the notion of lesson study features in research on Chinese teaching and teacher education. Here, lesson study is embedded in the work of teacher research groups (*jiaoyanzu*), a common feature of school organisation (Ma, 1999; Paine, 1990; Paine & Ma, 1993).

The most important features of lesson study in Japan and China are:

› using the teachers' own classrooms as laboratories for professional development

› acknowledging the public nature of teaching and importance of teachers working together

› using 'action research' as a means of professional development—that is, research undertaken by practitioners based on issues of relevance to their practice

› emphasising the need to understand student thinking

› respecting the cumulative impact of writing and disseminating reports.

An important feature of this work is balancing teacher initiative and outside work and guidance:

> While the process of lesson study is bottom-up in relying primarily on teachers' initiative and leadership, outsiders do provide advice. University scholars, school administrators and other educational leaders are invited to participate in lesson study deliberations at certain points in order to contribute this outside perspective. *(Schwille et al., 2007, p. 113)*

Example 2: Lesson study in Guinea

Schwille et al. (2007) readily acknowledge that while the lesson-study approach works well in countries with an already highly educated teacher workforce, it is difficult to implement in countries that do not have such a workforce. However, to demonstrate that it can work in other contexts, Schwille et al. outline how, in the West African country of Guinea, a program with many of the lesson study features of China and Japan was developed and brought to national scale. This was built around a small grants program to provide organisational support and incentives for teams of primary teachers to carry out their own school improvement and professional development projects. Schwille (2007) reports that, in just six years (1996 to 2002), the program grew from a pilot in one region to a nation-wide effort in which 35 per cent of the teaching workforce was able to participate in one of 1200 funded projects (Association for the Development of Education in Africa, 2001; Diallo, Camara, Schwille, Dembele & Bah, 2001; Schwille, Dembélé & Diallo, 2001).

Organisational support for this program was provided mainly by about 300 facilitators and evaluators selected from mid-level ministry personnel. While Schwille et al. (2007) regard the Guinea experience as successful, some writers and researchers have expressed reservations about applying the lesson-study model in countries where teachers have little education or training (Johnson, Hodges & Monk, 2000). These researchers believe that teachers should be helped to more gradually move towards taking more responsibility for their own professional learning.

Example 3: Lesson study experience in Asian-Pacific Economic Cooperation (APEC) countries

Recognising the effectiveness of the lesson-study approach, a 'Lesson Study Track' was held at the inaugural seminar of the Asian-Pacific Economic Cooperation–Southeast Asian Ministers of Education Organisation Regional Language Centre International Language Seminar (APEC–SEAMO RELC) in 2010 to collaboratively apply and evaluate lesson study for language teaching among APEC member economies. The track's overarching purpose was to promote higher proficiency in shared languages among APEC member economies.

At this seminar, language teachers and researchers from 12 APEC member economies gave highly positive reports of their experiences of lesson study as a professional development activity. In the Lesson Study Track, sponsored by the Chinese Taipei Ministry of Education and APEC, teams of teachers and researchers from each member economy reported on the processes they had followed, their experiences in implementation, and the lessons they had learned. In most member economies, the teams had made use of existing supports and structures in the local education system to make lesson study work for them. The response from participating teachers was overwhelmingly positive, and it was agreed that lesson study was a more efficient, valuable and cost-effective way of providing professional development than were expensive in-service teacher training programs conducted in venues external to the schools.

At the end of member economy presentations, participants identified these potential themes for projects to follow-up on collaboration in lesson study:

- › effects of lesson study on the teacher role, teacher learning and teacher performance
- › lesson-study applications for university teaching
- › best practice for applying lesson study throughout a member economy
- › role of culture in lesson-study collaborations, and influence of culture on how teachers collaborate, teach and learn.

Participants from many economies said they wanted to participate in an international professional community to further their experiences of professional collaboration.

Example 4: School clusters as the locus of learning for teachers of Ethiopia

Another example of the teacher-centred lesson approach cited by Schwille et al. (2007) is the one implemented in Ethiopia where most teachers had no experience of professional learning (Leu, 2004) until the USAID-funded Basic Education System Overhaul provided extensive teacher education based on clusters of schools. The program was not initially supported by the central education authorities because of their long tradition of centralised, expert-driven programs and refusal to believe that teachers could, with supporting material, facilitate their own professional learning programs based on their own perceptions of need (Educational Quality Improvement Program (EQUIP) 2002 cited in Schwille et al., 2007). Ultimately, however, the program proved popular with teachers and stakeholders indicated it was successful (EQUIP 2002 cited in Schwille et al., 2007).

Example 5: Teacher resource centres in South Asia and Africa

An extensive review in India, Kenya, Nepal and Zambia of the effectiveness of teacher resource centres as a method of teacher development, highlighted relevant lessons learned from implementation (Knamiller, 1999). These findings are relevant to the specific approach of centres for teacher development and to other forms of in-service teacher development. In general, the experience of teacher resource centres affirms the arguments outlined earlier about the importance of locating teacher development within schools. The centres reviewed in the Knamiller study were often too inaccessible for teachers to make good use of them. A major difficulty of remote training was that when teachers left the school to attend off-site training, there was no teacher to cover their classrooms. The teacher resource centre strategy thus relied on selecting a subset of teachers to be trained, who would then transmit knowledge to other teachers in their school. This cascade model of training has, however, been widely shown to be ineffective, with teachers at times experiencing difficulties sharing their knowledge with colleagues. Such findings point to the general ineffectiveness of off-site, in-service training. Similarly, providing in-service training to a sub-group of teachers makes change in teaching practice unlikely across a school.

A range of research suggests that in-service teacher development is most likely to be effective when it builds on what teachers already do in the classroom, rather than introducing sudden and fundamental changes in teaching practice from outside sources (Knamiller, 1999). In-service courses that lack relevance to the day-to-day work of teachers in schools make it less likely that training will be reflected in improved classroom practices. The effectiveness of approaches to in-service teacher development will be significantly influenced by factors such as the knowledge and skills of participating teachers, the characteristics of their teaching environments and the expectations of the school curriculum (Knamiller, 1999). These factors are often not considered during specific training provided to teachers in teacher resource centres: the realities of teacher classroom practice, such as currently using text books for example, may be ignored.

Example 6: The Child Friendly Schools Initiative in Pakistan

As outlined in Chapter 2, various studies into teacher education in Pakistan have found that the quality and performance of teachers is poor. While all studies have stated that teacher performance and quality is most affected by educational qualifications of teachers, recruitment on merit, adequate performance monitoring systems incentives, upgrade of teacher skills and growth-oriented career structures, government agencies have been slow to move in these areas (USAID, 2006).

The Situation Analysis of Teacher Education in Pakistan found that most teachers in Pakistan did not have satisfactory levels of content knowledge, and that only a small number of teachers could avail themselves of programs, like the EC-NPEC, that encourage them to enhance their academic qualifications through scholarships. With pre-service teacher training, the report also found:

› almost all training programs lack a systematic follow-up to gauge the performance of their trained teachers (USAID, 2006, p. 50)

› lack of a well-defined career structure for teacher educators; chronic shortage of specialist teacher educators; and lack, among most staff, of experience of teaching in schools for which they prepare trainees (for instance secondary-level subject specialists preparing primary teachers) (USAID, 2006, p. 50).

Despite challenges, some initiatives are having positive results in Pakistan. One of these is UNICEF Child Friendly Schools (CFS), which operates in a number of school systems in developing countries, including Pakistan where UNICEF has worked closely with more than 1000 schools. CFS's major purpose is to improve the quality of school experiences for children by improving the attractiveness of whole school environments and clusters of schools, making them conducive to learning and, importantly, providing the conditions under which teachers as well as students can learn effectively. Continuing professional development activities for teachers in CFS schools are child-focused. They promote interactive and inclusive teaching and learning and encourage the establishment of schools as collaborative, well-resourced, communities that involve parents and families. School leaders, in conjunction with school district personnel, receive special training in CFS and are responsible for ensuring that teachers participate in professional development activities that benefit the whole school community, and allowing teachers to reflect on practices that will lead to improved student learning outcomes (UNICEF, 2009).

Example 7: Enhancing the skills of teacher trainers in Cambodia

The recommendations described by Courtney (2007) guided the development of an in-service teacher development project to improve the teaching of mathematics in Cambodia. Basic Education Teacher Training (BETT) was supported by Belgium Technical Cooperation. Prior experience with teacher development in Cambodia, through the Education Quality Improvement Project (EQIP) supported by the World Bank, guided BETT. Analysis of EQIP showed that teacher trainers had high levels of responsibility for teacher development, but were inadequately trained for this role. As a result, teachers often misunderstood the concepts taught, a problem exacerbated by the cascade method of transmitting training. Classroom observation showed that teachers' poor understanding of how to use new concepts, such as group work and discussion, often resulted in students sitting in large groups with most not engaged in any activity. Lessons learned from EQIP highlighted the key role of teacher trainers, with more extensive training required to develop their subject knowledge and pedagogy to a level where they could deliver courses effectively. For learning to be adopted by teachers, training needs to be closely connected to teachers' experiences and incorporate text books used in classrooms.

Courtney (2007) found that trainers increased their understanding of mathematics and effective teaching methods through participation in BETT. Classroom observations suggested that trainers developed a better capacity for providing feedback to teachers, although some still had difficulty providing appropriate recommendations for improvement based on lesson observations. Teacher trainers valued the opportunity to undertake a practice training session as part of their preparation for the role. School directors were closely involved in the training program to encourage support and development for the program within schools. Both school directors and classroom teachers valued follow-up visits undertaken by teacher trainers and sought opportunities for these visits to be expanded.

4.5 Approaches to providing school-based support

The hardest work of improving teacher professional development is at the back-end—motivating and enabling teachers to change how they teach

A growing theme in the literature on teachers' professional learning is that it occurs largely at school level as teachers gradually accumulate knowledge and experience of subjects, content and pedagogy during a lifetime of teaching. This entails teachers working collaboratively, focusing on student learning, joint planning, examining students' work, and monitoring and assessing progress. The focus of teacher learning is not limited to the school, as teachers may be engaged in professional learning such as university programs or system-designed programs on various facets of teaching. The central principle is *integration*, where evidence-based theoretical knowledge derived from research is applied, shared and reflected upon at classroom and school levels (Fleming & Kleinhenz, 2007; Garet et al., 2001; Hawley & Valli, 1999; Ingvarson et al., 2005; Kennedy, 1998; Kriewaldt, 2008; Meiers & Ingvarson, 2005; Supovitz, 2001; Thompson, 2003; Timperley, 2008; Timperley, Wilson, Barrar & Fung, 2007; Wilson & Berne, 1999).

This now well-recognised principle of making teacher practice the site for professional learning represents a major shift from traditional learning based on participating in courses. This is not to imply that course-based and other activities, such as workshops and conferences, do not play an important role in supporting professional learning, but these activities are only the front-end of improving the work of teachers. Research conducted more than 30 years ago found the back end of influencing change and improvement is where the hard work is needed, such as supporting teachers as they test new approaches in their own classrooms (Fullan, 1983).

Strong, effective school leadership is critically important for successful teacher development in schools

Excellent leadership at school level is probably *the most important school-based factor* in promoting teacher professional learning. There is vast school leadership literature and literally thousands of studies on the topic. In the context of this literature review, only a brief outline is provided.

The old discourse of school leadership expected school leaders to be primarily education managers and administrators. The switch in terminology from 'management' to 'leadership', which started in the early 1990s, signified an expectation that school leaders should be responsible and accountable for the learning of their students and therefore responsible for promoting the conditions for successful student outcomes, including (and especially) the professional learning of teaching staff. Much attention has been given to notions of the 'guiding conceptions' of good school leadership, and there is growing consensus that leadership should not just be exercised in the principal class, but also shared among staff, especially senior staff (Fullan, 2001; Sergiovanni, 1999).

Mentoring is a crucial part of high-quality in-service support

Mentoring of less-experienced teachers by experienced colleagues is a necessary part of school-based professional learning. In a United States' survey, expert teachers were asked to retrospectively consider what types of support were most important for their professional development during the novice stage of their teaching. Access to a mentor was the most highly ranked experience (Behrstock-Sherratt et al., 2014). Mentoring can be stand-alone, as a purely school-based and directed initiative, or it can be a component of a wider program. Being part of a wider program where mentors have access to professional learning, for instance at a university or as a system initiative, helps to ensure that mentoring is not just a matter of passing on 'the tricks of the trade', but is anchored in a broader theoretical framework. Professional teaching standards that spell out what teachers should know and be able to do at specific career stages are useful in this respect.

Howe (2006), after reviewing a range of international mentoring programs, concluded that mentoring was a crucial part of high-quality programs that promoted a successful transition from university-graduation to classroom teaching for new teachers. Mentoring is especially important in contexts where practising teachers have little or no formal teacher training. Smith and Ingersoll (2004) noted that there was a need for further research on mentoring to assess factors like how mentors were trained and selected and frequency of contact between mentors and mentees.

4.6 Good quality school-based education and training is especially important if in-service teacher development is the only option

The foregoing sections of this chapter outline some themes and issues common to school-based professional learning for teachers, and some principles for effective programs and initiatives. These will be influenced by context, not only across countries, but across individual schools in the same country. In Australia, for example, a mentoring program in a remote school serving an Indigenous community is very different to a mentoring program in a large school in Canberra, Melbourne or Sydney.

Moon (2007) makes the interesting point that, in most developing countries, teachers' continuing professional development takes place *of necessity* at school level. He also notes the difficulties involved in identifying the characteristics of a teaching profession:

> Whilst the descriptor "teacher" is used it may frequently refer to someone who at best could be considered a para-professional with little formal education and no specific teacher training. In some countries teacher and teacher education policy systems appear to turn a guilty but blind eye to the causes of this and the consequent needs of those playing this role. *(Moon, 2007, p. 22)*

Moon (2007, p. 22) has asked questions about the type of professional learning experiences teachers should expect when most or all of their professional development takes place in their schools. He is also interested in identifying the types of framework for provision that schools and agencies should establish, and how new forms of communication technologies can be integrated.

These questions are important for designers and deliverers of in-school professional learning programs because they are at the heart of school-based professional learning for teachers. It is important to place the teacher experience at the centre of learning, as experience is the foundation upon which future learning is built.

Frameworks for provision, especially curriculum frameworks, are also important because they provide a context for learning. They will also influence much of the content of programs.

New forms of communication technologies can be integrated into provision in many ways, including: facilitating communication between course developers, providers and teachers; providing feedback on progress; providing fast access to information and how to process it; using various applications such as learning games and activities; and providing online access to specific learning programs. These technologies are useful and relevant to teachers who practise in remote locations. The notion of entitlement, also raised by Moon, poses further questions. Ideally, all teachers should be entitled to access technologies, but in reality this often depends on available resources and circumstances.

Schwille et al. (2007) have similar queries to those posed by Moon (2007). They also agree that if teacher work is to improve as a result of successful professional learning experiences, the experiences should centre on practice. They say that isolated training events may serve limited purposes, such as introducing a new textbook, but in general, 'research indicates that this is an ineffective, inefficient and costly investment of human and fiscal resources' (Schwille et al., 2007, p. 104). These researchers also express reservations about cascading or train-the-trainer models of professional development. Referring to the work of Boyle, White and Boyle (2004), these researchers conclude that this approach has many shortcomings and does not always lead to change in teacher classroom work.

4.7 Conclusions

The evidence reviewed in this chapter provides insights on effective professional learning for teachers and school-based support.

Factors that emerge as significant to providing professional development for teachers in developing countries include:

› The most effective professional learning takes place at school level as teachers collaboratively engage in planning, assessing and evaluating students' progress, innovation and reflection.

› Central authorities and universities play an important role in these learning processes, but this should be mainly organisational, facilitative and focused on integrating theory and practice.

› School-based support depends heavily on school leaders who are responsible and accountable for the learning of their students and who promote the conditions for successful student outcomes, especially the professional learning of teaching staff.

› Mentoring of less experienced teachers by experienced colleagues is a necessary part of school-based professional learning and especially important in contexts where practising teachers have little or no formal teacher training.

› The lesson-study approach works well with a highly educated and motivated teaching workforce. If introduced gradually and/or supported through school clusters, teacher performance and lesson-centred approaches *may* work in resource-constrained contexts.

› Teacher resource centres need to be conveniently located and schools must have relief teachers so staff can use the resource centres.

Acronyms and abbreviations

ACER	Australian Council for Educational Research
AusAID	Australian Agency for International Development (now Department of Foreign Affairs and Trade)
BETT	Basic Education Teacher Training
CFS	Child Friendly Schools (Pakistan)
DFAT	Department of Foreign Affairs and Trade
DfID	Department for International Development (United Kingdom)
EFA	Education For All
ESIP	Education Strategic Investment Plan
MIITEP	Malawi Integrated In-Service Teacher Education Programme
MUSTER	Multi-Site Teacher Education Research
ODE	Office of Development Effectiveness
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
SIDA	Swedish International Development Cooperation Agency
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VSO	Voluntary Services Overseas

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