Australian Government

Department of Foreign Affairs and Trade

Teacher quality: evidence review

Acknowledgments

The evaluation team

Foreword

To achieve the fundamental purpose of the Australian aid program—to help people overcome poverty—the Australian Government's aid policy, *An Effective Aid Program for Australia* states that Australia's approach will be based on 'concrete evidence of what works best on the ground to produce results.'

Established in 2006, the Office of Development Effectiveness (ODE) at the Australian Government Department of Foreign Affairs and Trade (DFAT) builds stronger evidence for more effective aid.

ODE draws its evidence from in-depth evaluations and reviews of Australian aid, analysis of aid performance systems, and collaborations with leading international think tanks and research organisations to influence and advise the Australian aid program.

As an independent unit within DFAT, ODE is uniquely placed to assess performance across the Australian aid program and bring international best practice to bear in identifying new and better ways of working. The evaluation program for ODE is framed in this context and targets areas where effectiveness can be improved.

Abbreviations

CPD	Continuing Professional Development
DFAT	Department of Foreign Affairs and Trade
DFID	Department for International Development
EMIS	Education Management Information System
ERIC	Education Resource Information Centre
ODE	Office of Development Effectiveness
OECD	Office for Economic Cooperation and Development
PEDP III	Primary Education Development Programme III
TALIS	Teaching and Learning International Survey
TDM	Teacher Development and Management (Rwanda policy)
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SES	Socio-economic status

Contents

1   Introduction

This literature review forms part of an evaluability assessment to inform decisions about the scope, focus, questions and methods for a proposed evaluation of the influence of Australian aid on teacher quality, and ultimately whether or not to proceed with the evaluation.

The specific purpose of this literature review is to gather and assess external (not DFAT-generated) evidence which can be used to shape the conceptual framework, and to inform recommendations about appropriate research methods for an evaluation of the influence of aid on teacher quality.

The paper is structured in the following way: Section 2 reviews the relationship between teacher quality and student outcomes, beginning with a review of current usage of the term, unpacking some of the aspects associated with quality. This review will contextualise the empirical research on the effects of teachers on student outcomes. Section 3 considers the different factors that shape teacher quality focusing on national policy and governance frameworks, professional development opportunities, school contexts and donor engagement. Section 4 considers the evidence gaps emerging from the review for DFAT evaluation and programming.

1.1   Methodology

Given the timeframe and the scope, it was not possible to carry out a fully comprehensive review of all literature relating to aid and teacher quality. Searches of published literature were conducted using the Education Resource Information Centre (ERIC) and a range of search terms and parameters (as set out in Appendix A). Additional searches were conducted through international development agency websites and other web-based education and knowledge sharing web resources. The review was conducted in two phases.

Firstly a review was carried out of international reviews, meta-studies and the conceptual literature about teacher quality to explore consensus over the factors that contribute to teacher quality and quality teaching. The search conducted on ERIC produced 222 records that were further scanned for quality and relevance and refined to a list of about 30 papers. The quality grading criteria are detailed in Appendix A.

Further searches were then conducted to find papers to explore particular aspects of teacher quality emerging from the more general review, particularly in the context of low- and middle-income countries in Asia and the Pacific. This search conducted on ERIC produced 456 records for the timeframe 1995 to 2013. Given the time constraints, it was not possible to consider all of these in the review, and thus only literature published since 2000 was included (402 papers). These were further scanned for quality and relevance and refined to a list of about 25 papers.

This review focuses on literature on teachers in primary/ basic education, and higher education institutions that train teachers to teach at this level. It looks at global studies and reviews of international literature, but for specific studies it concentrates on those conducted in low- to middle-

income countries in Asia and the Pacific. Special attention has been given to the literature on teacher quality in fragile and conflict-affected states[1].

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[1] There are a number of aspects which have a bearing on teacher quality and are addressed in the report but deserve further analysis. These include: effective forms of school-based professional development; the link between teacher policy and well-being; and teacher motivation.

2 The meaning of teacher quality and its relationship to student outcomes

This section deals with defining teacher quality as it relates to student outcomes and school system effectiveness.

Teacher quality is a contested term with multiple meanings, often reflecting the perspectives and interest of different writers, researchers and policymakers (Strong 2012). For some it is about academic ability (as indicated by qualifications). For others it is about the quality of classroom practice. For those interested in effectiveness it relates to raising student achievement. As Berliner (2005, p. 206) notes 'quality always requires value judgments about which disagreement abound.' Moreover, the term 'quality teacher' is often used with adjectives such as good and effective which implies a particular definition of quality teachers.

Even among the international donors who frequently use the term, there is an assumed meaning of the term. Although many refer to it, few have attempted to define its meaning. While some view teacher quality as comprising the training and the attributes of the teacher, others take a more holistic view. The latter group considers teacher quality as including the training and continuous professional development of the teacher, student outcomes, the working environment in which the teacher operates including learning resources, and other support the teacher receives including school management and leadership, and teacher remuneration. While there may be debates about the term, there are some areas of agreement about what constitutes teacher quality and what makes for effective classroom practice as this literature review identifies.

Cochran-Smith (2001) provides a useful historical overview of the emergence of the term and its different usages:

1. Initial debates (1950s through the 1960s) about teacher quality were about the attributes that makes up a good teacher. The key question was: what are the different psychological and behavioural attributes of a good teacher? In addition, what attributes contribute to good teacher education programs

2. This was slowly supplanted in the late 1960s to the late 1980s with a focus on effectiveness. The key issues were about the teaching strategies and approaches of the most effective teachers. What strategies should teacher education programs use in ensuring that trainee teachers are effective?

3. From the early 1980s to the late 1990s, the focus became more about the knowledge of teachers. What should teachers know and be able to do? What knowledge, skills and attitudes should teachers have

4. From the 20th century and in the 21st century the most important question focuses on outcomes, specifically, the impact of teachers on learners. A more recent trend is to measure teacher

knowledge (both subject and pedagogic knowledge) through testing teachers, rather than relying solely on qualifications and years of experiences as the main indicators of teacher competence.

In the recent focus on student outcomes, Cochran-Smith (2005) argues that teacher education and teacher quality have become constructed as a policy problem. The key issue in constructing it as a policy problem is to understand what is amenable to control and influence by policymakers and likely to have a desired positive impact on student outcomes.

A key issue for policy is to consider what aspects of teacher policy including teacher remuneration, teacher professional development, including pre- and in-service training, and school-related factors such as school governance have an impact on teacher quality and student outcomes. This review will consider these issues in relation to quality teaching and quality teachers (Cochran-Smith 2005; Strong 2012). The former refers to successful and effective teaching practices. The latter refers to the attributes of an individual teacher, including: their beliefs, sources of motivation, professional development, as well as their experience, and their competences. In this paper, teacher quality is understood as encompassing both 'quality teaching' and 'quality teachers' and as such, includes teacher's personal qualities, skills, knowledge and understanding, their classroom practices and importantly their impact on student outcomes. Specifically, this refers to:

› **Competence:** competence refers to the knowledge, skills and attitudes teachers acquire through the process of initial (and continuing) training. It is usually marked by the possession of a qualification which certifies teachers, although, as the literature points out this does not necessarily imply effective teaching including pedagogical knowledge /pedagogic skills/subject knowledge. Competence is usually acquired through some form of pre- and/or in-service professional development training recognising trainees' prior learning experiences. Educational International interprets competence as going beyond trained behaviour to include critical thinking skills, reflective capabilities and a development process (Education International 2011)

› **Teacher professionalism:** this refers to teacher quality as the commitment to maintaining the highest standards of professional conduct and fidelity to the standards of the profession to which they belong. It is also implies a lifelong learning attitude towards teacher professional development and the exercise of professional behaviour and autonomy. One component of this is professional freedom, which recognises that the teacher is best equipped to decide which methods to use in order to create an optimal learning environment. Professional freedom enhances teachers' creativity and provides learning that is free from political, economic, ideological or religious influence in order to preserve students' right to democratically exercise their creativity

› **Exercise of personal attributes and values:** Whilst teacher quality is hard to define and measure, research widely acknowledges that it is about the beliefs, values and attitudes that teachers develop and possess. This includes values such as believing all students can learn; having a cooperative and democratic attitude, valuing and cherishing equitable treatment of all students and valuing diversity. This category also includes teacher dispositions such as motivation and passion for teaching. Personal attributes are ultimately linked to teachers' conceptions of their work and their identity/ies, including their professional commitment to social justice and equity

› **Teacher relationships with parents and community:** In development contexts, the ability of the teacher to develop good relationships with parents and the local community is an important aspect of their professional responsibilities and expected roles. Teacher relationships with the community are an important aspect of ensuring that teachers are accountable to the school community and to their pupils.

› **Teacher practices:** This refers to effective teacher practices in the classroom in specific contexts meeting the distinctive needs of students and student outcomes.

2.1   Teacher quality and the performance of schools and school systems

Various international studies highlight the fact that effective schools are those which have good quality teachers. According to a review by the World Bank (2012) "a number of studies have found that teacher effectiveness is one of the most important school-based predictors of student learning and that several years of teaching by outstanding teachers can offset the learning deficits of disadvantaged students" (p. 1). A range of studies that explore what makes school systems effective have looked for common characteristics in the top performing education systems in international achievement tests, with a view to identifying features that account for success (OECD 2010; Barber and Mourshed 2007; Mourshed, Chijioke and Barber 2010; Vegas, Ganimian and Jaimovich 2012). These studies have reached similar conclusions. The key strategies they identify for improving student outcomes centre around developing a quality teacher workforce, which aims to:

› Attract, recruit and retain high quality candidates into teacher training

› Train with extensive school-based practice

› Train with high level subject specialisation and academic rigour

› Provide teachers with personalised continuing professional development (CPD) through mentoring and coaching

› Involve teachers in research and education policymaking.

These studies of the top performing education systems in international achievement tests have been fruitful in the insights they have provided. However, there are several constraints in their methodology:

› It is limited in its ability to control for contributing factors outside of the education system (for example, national identity, economic development, social welfare, inequities in society, pupils' socio-economic backgrounds)

› The studies are also usually confined to higher-income countries, as these are the countries that are most able to afford to participate in international achievement tests, and the ones that have tended to come out on top

› They also fail to consider intra-country differences.

Moreover, those high-income countries that are at the top of the assessment league table are usually those – like Finland – which have small populations and are relatively culturally and linguistically homogenous (Alexander 2010, p. 814). The second of two reports by McKinsey (Mourshed, Chijioke and Barber 2010) takes a more nuanced approach. It looks at the changes in student outcomes over time and then investigates the common features of improving systems. The authors classify education systems as poor, fair, good and great, and then look for the strategies that appear to be the most effective at moving systems one step up the scale. This report is therefore more informative about the strategies that should be supported in lower- to middle-income contexts (although no low-income countries are included). It suggests that for poor performing middle income education systems to become fair performing systems (examples include Ghana and Madhya Pradesh in India), interventions need to focus on supporting students to achieve basics in literacy and mathematics. The authors recommend supporting teachers by providing scripted lesson plans and coaching on the curriculum. They argue that interventions should focus on increasing student instructional time. To

support school leaders in the management of teachers, the authors recommend frequent visits to the school by the central authorities and incentives for teachers that reward high performance.

In order to progress from fair to good (recent examples include Chile and Armenia), the authors recommend ensuring teacher and school accountability, and creating appropriate models of pedagogy. Systems at higher levels should focus more on reforms that promote teacher professionalism. Ensuring an appropriate reward and remunerations structure for teachers and principals and building their technical skills are interventions recommended for all stages of the progression. Many of the systems reviewed use teachers to coach their peers.

However, Alexander (2010) argues against global prescriptions of this order, suggesting that reform and interventions should be tailored around individual schools and the teachers in schools. Similarly, Coffield (2012) is in favour of allowing teachers more flexibility to make decisions and more decentralised decision-making. He argues for more equality between teachers and principals and for teachers to work with students 'as equals'. He is against 'rigid, centralised control' and 'one size fits all best practices'.

2.2   Context-specific nature of teacher quality and quality teaching

Critiques have pointed to the problem of assuming a direct relationship between teacher quality and student outcomes that is independent of context. As Fenstermacher & Richardson (2005, p. 205) note:

> *There is currently a considerable focus on quality teaching, much of it rooted in the presumption that the improvement of teaching is a key element in improving student learning. We believe that this policy focus rests on a naive conception of the relationship between teaching and learning. This conception treats the relationship as a straightforward causal connection, such that it could be effective, it could be sustained under almost any condition, including poverty, vast linguistic, racial or cultural differences …*

Fenstermacher & Richardson (2005) also consider good teaching in relation to the worthiness of the activity. Quality teaching is thus not about what is taught and how successfully, but whether what is taught is morally defensible, and whether the methods employed to teach are reasonable. As they (2005, p. 189) explain:

> *Good teaching is teaching that comports with morally defensible and rationally sound principles of instructional practice. Successful teaching is teaching that yields the intended learning.*

These insights about the types of quality teaching are important as they suggest that quality teaching is not only about student outcomes but is also about teaching as a moral activity.

2.3   The relationship between teacher quality and student outcomes

After student characteristics such as home background, it is teacher characteristics that arguably have the greatest influence on student outcomes. Research from various contexts indicates that having an effective teacher matters:

› Several meta-analyses or single country quantitative studies of successful student outcomes from a range of contexts attempt to identify the impact of teacher quality (World Bank 2012; Hattie, 2009; Glewwe et al. 2011) on student outcomes and the factors of teacher quality that make a

difference, including subject knowledge, professional development and classroom practices. For example, in a study of the relationship between teacher quality and pupil achievement in the UK General Certificate of Secondary Education (GCSE) examinations, Slater et al. (2012) found that pupils taught by teachers that demonstrated characteristics associated with teacher quality achieved nearly half a grade higher than those taught by teachers who lacked such characteristics

› Nye, Konstantopoulos and Hedges (2004) investigated the in-school variation in teacher effectiveness in early grade teaching in the USA. They found that the teacher has a significant effect on the reading and mathematics test scores of their students. However, they were not able to identify the common characteristics of effective teachers. Résumé characteristics such as teacher experience and teacher education accounted for only a small degree of the variation in teacher effectiveness. They go on to show that teacher effects are higher in low socio-economic status (SES) schools than in high SES schools and that in low SES schools it matters more that teachers are effective than in high SES schools

› Hattie (2009) reviewed over 800 meta-analyses of research into student learning and concluded that teacher professional development had a greater impact on student outcomes than many other variables of teacher quality. He found that the impact of teacher's level of education on student outcomes is relatively negligible compared to other aspects of the quality of teaching, the strategies used and the quality of teacher-student relationships, all of which had much larger effects. He found that providing frequent formative feedback to students was a consistently effective teaching strategy

› In contrast, a meta-analysis of research conducted from 1990 to 2010 on the school-level factors influencing student outcomes in developing countries concluded that more knowledgeable teachers, teachers who are less likely to be absent, and teachers who assign homework, are among some of the few school variables with a consistently positive relationship to student outcomes (Glewwe et al. 2011). Studies into teacher education levels generally found a positive relationship with student learning. The evidence of a positive relationship between teacher knowledge, as measured through teacher test scores, was even stronger with almost all studies finding a significant positive relationship.[2]

› Akiba, LeTendre and Scribner (2007) in their analysis of the Trends in Mathematics and Science Study (TIMSS) data set, identify four indicators for measuring teacher quality: certification, mathematics degree, mathematics education degree, and teaching experience of three or more years. They find that at the national level, student outcomes in mathematics are closely correlated to these dimensions of teacher quality.

While the various studies concur that teacher quality affects student outcomes, they tend to differ in what they consider to be the important aspects of teacher quality that explain the difference in student outcomes. Thus, while Hattie argues that the level of teacher qualifications by itself does not matter significantly, Gleewe et al. and Akiba et al. argue that they do. Part of the reason for this divergence could be their methodologies or different contexts, but it could be that fundamentally what matters most are teacher classroom practices. This finding is confirmed in other developing country studies. For instance, Aslam and Kingdon's (2011) research in Pakistan found that standard résumé characteristics of teachers, such as teacher certification, did not significantly impact on student

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[2]   Both studies also agree that a teacher's education level is a factor in teacher quality, although Hattie finds this to be less significant than Glewwe et al. A possible reason for the apparently different weighting accorded to a teacher's education level is that whereas Hattie's research is primarily based in developed economies, Glewwe et al.'s synthesis (2011) focuses on developing countries where teacher education levels are often lower and more likely to be a limited, but nevertheless influential factor in determining teaching quality.

achievement, but teaching 'process' variables did have a significant impact. The largest positive effects on pupil achievement were from being taught by teachers who planned their lessons and teachers who asked many questions from pupils during lessons. Quizzing on past lessons and reviewing homework were also associated with student learning gains, although the effect sizes were smaller.

In summary, there is evidence to suggest that teacher quality is dependent on a combination of different factors such as classroom practices, subject knowledge, professional development, teaching experience and quality of teacher-student relationships which in turn impact on student outcomes. These findings signal that it cannot be automatically assumed that teacher certificates and qualifications lead to better teaching. Thus, the focus on teacher quality should be on the effects of teachers on learning. The research reviewed should not be interpreted as suggesting that teacher qualifications should be dispensed with or that initial teacher education is unimportant.

3 Factors that influence teacher quality

This section review three factors that impact on teacher quality, namely professional development, school context and policy.

3.1 Professional development

This section of the review considers two interrelated aspects about teacher professional development: effective pre-service education and effective continuing professional development (also known as in-service education). It begins with a discussion of teacher qualifications as this is intimately connected to professional development and can be considered as the formal process of accrediting training.

3.1.1 Initial teacher preparation

A range of studies (OECD 2005; Barrett et al. 2007; Tatto et al. 2008; World Bank 2012; Mpokosa et al. 2008) highlight the importance of initial teacher preparation. A consistent characteristic of education systems that achieve top rankings in international learning assessments is that the teacher workforce is highly qualified (Barber and Mourshed 2007). Darling-Hammond's research in the USA (2000 and 2006) found that teacher preparation and certification was the most important predictor of student learning, especially for low performing students. Darling-Hammond (2000, p. 1) notes that:

> The findings of both the qualitative and quantitative analyses suggest that policy investments in the quality of teachers may be related to improvements in student performance. Quantitative analyses indicate that measures of teacher preparation and certification are by far the strongest correlates of student achievement in reading and mathematics, both before and after controlling for student poverty and language status ... This analysis suggests that policies adopted by states [in the USA] regarding teacher education, licensing, hiring, and professional development may make an important difference in the qualifications and capacities that teachers bring to their work.

In India, pre-service teacher training and having a Master's level qualification were found to have a significant positive correlation to learner outcomes (Kingdon 2006). Research in Pakistan (Tayyaba 2012) found that teachers' training was decisive in determining students' achievement, whereas availability of resources and multi-grade teaching were less important. A study using the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) data set found that years of professional training in teachers showed a positive relationship to mathematics achievement in some cases but not in others. Teacher content knowledge, however, was a statistically significant predictor for maths achievement of students in four out of five countries (Spreen and Fancsali 2005).

This section considers the knowledge, skills and values that should be fostered and developed through initial teacher training. The quality of the new teachers graduating from initial teacher training

will depend on the selection of candidates into the program, the modality of the training, the quality of the teacher educators, the teacher education curriculum and the assessment process. Generally, initial teacher preparation is aimed at providing trainees with exposure to theoretical aspects of education, subject content mastery, pedagogical skills and teaching practice[3].

Initial teacher preparation in developing countries is usually organised as a full time residential program with varying duration: in Pakistan, preparation for primary and secondary teachers is one year. In contrast, contract teachers in Mali undergo an accelerated 45 days of learning (Westbrook et al. unpublished draft mimeo). However, there is a shift in some countries (for example, Mexico and South Africa) to more integrated initial and continuing professional development models moving towards more school-based practice and learning. Given the low academic qualifications of entrants into teacher training courses in many low-income contexts, some argue that initial teacher training should have a greater focus on subject knowledge. However, training programs in these contexts often focus on pedagogical knowledge, based on the false premise that trainees are already confident in their subject knowledge (Schwille et al. 2007).

Research reviews of initial teacher education have identified several problems with the quality of training. These include: outdated curricula, misalignment of the teacher education with the school curriculum, limited practice-based learning opportunities during training, omission of newer curriculum subjects such as peace building, weaknesses in the knowledge and expertise of teacher educators and institutional management of initial teacher education institutions (Westbrook et al. unpublished draft mimeo, Lewin and Stuart 2003; Sayed, 2011).

There is a fair degree of consensus in the literature that effective initial training provides trainees with considerable opportunities for school-based training during the course (Lewin and Stuart 2003; Sayed 2011). However, this requires sufficient schools with enough well qualified and competent teachers to act as mentors to the trainees, and resources to act as training sites which is not always the case in many developing country contexts with trainees receiving little or no supervision or guidance from college tutors or teachers at the practice school (Schwille et al. 2007; Lewin and Stuart 2003).

A rigorous literature review notes a number of pedagogic strategies for successful teaching which are important for all teachers to be trained in including (Westbrook et al. unpublished draft mimeo):

1. Use of group and pair work

2. Use of a variety of teaching and learning materials

3. Posing questions to students

4. Demonstration and explanation drawing on pedagogical content knowledge

5. Using a local language with which students were familiar

6. Planning lessons with a clear structure

7. Feedback, individual attention and inclusion

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[3] This includes: learning about the social and historical contexts of education systems, theories of human and child development and learning, mastering the content and pedagogical content knowledge of subject areas, theory of class management, other general teaching skills and opportunities to practice teaching skills.

8. Creating a safe environment in which students are supported in their learning

9. Drawing on students' backgrounds and experiences.

Initial teacher training is important in the formation of teacher skills, attitudes and values collectively referred to as teacher competence. Some reviews of initial teacher education (Lewin and Stuart 2003) note that it can make a difference to teacher quality if teacher education is high quality, well planned and provides trainees with content and pedagogical content knowledge, as well as meaningful opportunities to practice and to reflect on practice. Lewin and Stuart also stress the importance of a teacher education curriculum that recognises the prior learning experiences of teacher trainees and is matched to the needs of adult learners and focuses on the knowledge, skills and competences needed at the initial stage of their professional development rather than overburdening students with unnecessary content. Achieving this requires teacher educators who are committed and skilled to provide high quality training and to contribute to curriculum development. It also requires the opportunities and resources for trainee teachers to benefit from being mentored, school-based teaching practice and for the development of partnerships between schools and teacher education institutions. From the review of teacher attributes (outlined in Section 2), it is clear that teachers' teaching skills as well their content knowledge has a positive impact on their classroom practice and thus are core to good quality initial teacher training.

Recent research into teacher characteristics and student outcomes in Indonesia found that teacher knowledge, as measured through the written teacher competency assessment test, had the strongest positive relationship with student outcomes (World Bank 2013). Both subject matter knowledge scores and pedagogical knowledge scores were significantly correlated to student outcomes. The relationship with subject knowledge was the strongest. Having a four-year degree was also linked to improved learning outcomes although the relationship was not as strong.

3.1.2 Ongoing teacher professional development

Teacher quality is not fixed at the point of entry into the profession but can develop through experience and exposure to ongoing professional development opportunities, including in-service training workshops and school-based professional support including mentoring, and peer learning such as teacher study groups. Several reviews of continuing professional development (CPD) note that in-service training is effective if it:

> *Focuses on classroom application, is practice driven, is based on teachers' needs, focuses on problems of pedagogy and content that are evident in specific schools context, provides consistent support/advice over a long period of time and is regularly monitored and evaluated (Sayed 2009; Schwille et al., 2007).*

There are various models and forms of professional development and training. Currently there is much interest in collaborative lesson planning. Some research has demonstrated the effectiveness of collaborative lesson planning in enhancing teacher quality. Such activities were seen as helpful in China and Pakistan through the support of principals who modelled new pedagogies themselves. (Khan 2012, Wang and Lu, 2012). While lesson study[4] is regarded as a successful model in Japan,

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[4] Lesson study refers to the use of the classroom as a means of professional development whereby teachers observe each other teaching and working together to improve learning. It is a common model of in-service professional development in Japan and has taken hold in a number of developing countries as the rigorous literature review by Westbrook et al. (2013) shows.

where it is widely used, it has had mixed results across a range of other settings (Ono and Ferreira 2010).

School-based professional development, in the form of mentors for example, are often regarded as effective (Barrett et al. 2007).

Cascade training, usually in the form of training a cadre of trainers has been a popular method of in-service training. However, some research has found that the cascade method of training is not effective, particularly if the intention is to achieve sustainable changes to teacher practices. In a systematic review of untrained teachers, Orr et al. (2013) found that training which is relayed back to classroom teachers from a starting point away from the school by successive trainers, was not found to be an effective strategy.

Several single country studies of continuing professional development show mixed results.

› A single country study which investigated effectiveness of in-service mathematics teacher training in Sri Lanka found that most primary mathematics teachers in Sri Lanka were easily sensitised to some 'new' teaching strategies but found others more difficult to use routinely (Johnson 2006)

› An impact study of a professional development program in the Pacific to improve the instruction of reading found significant improvements to teacher knowledge, teacher practice and student outcomes in reading. The program combined workshops with lesson demonstrations, classroom observations, and peer learning groups (Abe et al. 2012)

› A study in Bangladesh found that the maximum school improvement could be achieved if schools put more emphasis on teachers' collaboration, in-service training and classroom observation (Hoque, Alam and Abdullah 2011)

› A study of teacher mentoring approaches in Pakistan found that collaborative partnerships between a teacher educator and teachers after they had attended an in-service training course at university, resulted in them contextualising their 'academic' learning, while at the same time assisting them to move away from routinised practices and to think reflectively (Mohammad and Harlech-Jones, 2008)

› A review of in-service education in a conflict-affected context, the Afghanistan Research and Evaluation Unit (2004) noted that many such programs in Afghanistan, including initial teacher training programs, emphasise rote teaching methodologies and did not empower teachers to understand their own practice and theories of learning.

Similarly, various meta reviews show mixed results. Glewwe et al. (2011) surveyed a wide range of studies from developing countries. Most found a positive relationship between in-service teacher training and student outcomes, but the relationship was not strong. A study using the SACMEQ data set found a significant negative relationship between the amount of in-service training teachers had received and the test scores of their students. However the same study found that there was a positive relationship in most francophone countries in Africa (Fehrler, Michaelowa, and Wechtler 2009). More recent initiatives by Japan International Cooperation Agency (JICA) providing institutionalised in-service training for mathematics and science teachers (Strengthening of Mathematics and Science in Secondary Education-SMASSE) report improved results for both teachers and students among the participating countries. For example, in Kenya where the project started, teachers were said to have improved the way they organised their mathematics and science lessons which led to increased student interest in the two subjects (JICA 2010).

A meta-review of in-service and ongoing training in the developed world context (Cordingley et al. 2007) found that it generally had a positive effect on student learning and teachers' professional development and motivation. Similarly, a meta-review of in-service and continuing professional

development in the US (Blank and Alas 2009) found significant effects on student achievement. Hattie (2009) notes that most continuous professional development courses appear to have more impact on the teachers than on the students they teach.

The mixed results of investigation of ongoing professional development after initial training can perhaps be explained by the fact that the quality of the provision is highly variable. This point is underscored by a 2012 report from McKinsey (Jayaram, Moffit and Scott 2012) that argues that professional development programs can significantly improve student achievement, but that school systems need to think strategically about their content and delivery, and to customise training to the particular needs of different teachers. They contend that in-person, on-site coaching is the most effective way to deliver advice on classroom practice, and that coaching should be the core of any good professional development program Similarly, other reviews of effective ongoing professional development (Scwhille et al. 2007; Sayed 2009) argue that training needs to needs to be tailored to teacher needs, provided in schools and focused on teaching approaches and skills that teachers can use in the classroom.

Schwille et al. (2007) present a range of more promising models from both developed and developing countries, although they provide only limited evidence of the outcomes of these models in terms of changes in teacher practice and student learning. This is a common feature of much of the research as not many investigations of ongoing professional development have explicitly sought to link the training to student outcomes. An inference which can be drawn from the research is that the effectiveness of ongoing professional development in relation to student outcomes is variable and that effectiveness does seem to relate to what kind of training is on offer, its quality, intensity, duration, how far it is context-specific and related to teacher needs, and how far it forms part of a planned, long term, sustainable program.

3.1.3   Teacher instructional time

Pre-and in-service Professional Development impacts on teacher practices in the classrooms. This section consider evidence relating to various aspects of teacher practices including instructional.

Glewwe et al. (2011) and Mourshed, Chijioke and Barber (2010) identify instructional time as a key determinant of student outcomes in developing country contexts. Teacher absenteeism which results in significant loss of instructional time, is cited as one of the major barriers to learning in developing countries (UNICEF 2012; World Bank 2010). Abadzi (2007) found that in many lower- and middle-income countries, actual instructional time is far lower than the government expectations. The research estimates that in Ghana students were only taught for 39 per cent of the intended instructional time[5]. Abadzi's study (2007) in Ghana, Tunisia, Morocco and Brazil estimates that teacher delays and absences (legitimate or otherwise) resulted in losses of 11.5 to 43 days during the school year. A study conducted in eight lower- and middle-income countries (Bangladesh, Ecuador, India, Indonesia, Papua New Guinea, Peru, Uganda and Zambia) found that between 11 and 27 per cent of teachers were absent from schools at times when they should have been teaching (Chaudury et al. 2005). This situation was more acute in rural schools. Rogers and Vegas (2009) identify poor teacher management and low levels of teacher accountability as drivers of high levels of teacher absenteeism. Their paper gives evidence of incentives, management, and support structures that can improve motivation and performance and reduce avoidable absenteeism.

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[5]   Reasons for loss of instructional time include multi-shift teaching to accommodate for shortages of classrooms, school closure (for example, schools in Honduras were found to be open only 57 per cent of the official days), teacher absenteeism, and poor use of instructional time inside the classroom.

Whilst teacher absenteeism and lateness was a major cause of loss of instructional time found in Abadzi's study (2007), the most significant block of time lost tended to be inside the classroom, due to poor classroom management and teachers not being in the classroom. The report also notes that the vast majority of instructional time was taken up with the teacher addressing the entire class, with little space for students' engagement in learning and feedback. This may have contributed to the relatively high proportion (around 20 per cent) of students observed to be off task and uninvolved.

Teacher time on task (in school instructional time) and absenteeism are interrelated in that effective learning requires teachers to come to school, to ensure that once they are in school they actually teach and, most importantly, ensure that the time spent on teaching is effective and productive. This reinforces the findings earlier that what matters for student learning is changing teachers' performance in the classroom to make it more effective.

A systematic review of research on the effectiveness of interventions aimed at increasing teacher attendance in developing countries (Guerrero et al. 2012) identified and reviewed nine studies. The review found that direct interventions coupling monitoring systems with rewards had a positive and statistically significant effect on teacher attendance. Indirect interventions involving the community in students' education and providing incentives schemes for students also had a positive and significant effect on teacher attendance. However, neither type of intervention strategy had an effect on student achievement.

3.1.4 Training untrained teachers

In many lower- and middle-income countries, a large proportion of teachers lack the level of training required by current teacher qualification standards. These teachers were often recruited during periods of rapid expansion of the education system, when the demand for teachers exceeded the supply. In these systems, ongoing professional development is necessary to ensure that untrained and undertrained teachers meet expected teacher standards and qualifications. In a systematic review of in-service training strategies for undertrained teachers, Orr et al. (2013) found that strategies that used combinations of workshops, structured lesson plans and in-class support showed evidence of positive impact on student learning. This review concludes that training untrained teachers is effective if it enables trainees to integrate new learning with their classroom practice. This review argues that such interventions should involve frequent, regular engagement with self-study materials, and/or taught sessions, and/or discussions with peers, and/or the opportunity to apply new learning and skills in the classroom, to give the greatest opportunity to improve performance. Workshops should be used initially to introduce the instructors, the other trainees, the program and the materials to the trainees. Later, workshops can be used effectively to reflect on teaching methods used in trainees' classrooms. Workshops are less effective for transmitting subject knowledge through lecturing. The review also points out that the quality of trainers and training materials is very important. Endorsing this finding, a single country study in Pakistan found that , peer mentoring of uncertified teachers by their certified colleagues through a cluster based mentoring model was found to have a positive impact on mentee teachers' competency, teaching methods and on overall school culture (Hussain & Ali 2010).

There are a few single country or meta review studies about the training of untrained teachers in conflict-affected contexts. One such study in Rwanda analysed the Ministry's Education Strategic Sector Plan's (2003) program to train unqualified teachers[6]. The analysis found that the Rwandan

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[6]   The program provided teacher training to improve teacher knowledge, skills, methodology and qualifications of untrained teachers currently serving in schools. The program targeted science and

Teacher Development and Management (TDM) policy, which is the core of the program, promoted greater teacher ownership over professional development but that lack of supervisory and mentoring capacity limited the successful implementation of the policy. Based on their analysis of this policy, the authors recommend that teacher training should occur at the school level and that policymakers should encourage communities of practice that contribute to an improved professional image of teachers (Rutaisire and Gahima 2009).

3.2   School environment

The local setting of the school and its community are factors conditioned both by policy and training as noted above. The school context has a direct impact on teachers' class room practices and thus impacts on student outcomes (Lee et al. 2012). The leadership and governance of schools has a crucial impact on teacher classroom practices. Whether teachers attend school regularly, whether they spent time in school teaching, whether they have access to ongoing school-based professional development, all rely on effective and visionary instructional leadership, management and school governance.

3.2.1   School-based management and community involvement

Community involvement in schooling and staff management can have a positive effect on teacher quality and student outcomes. Mpokosa et al. (2008) and World Bank (2012) highlight the importance of the role of head teachers in managing teachers. Giving the schools, and school communities greater autonomy to hire, monitor and fire its teachers has been presented as a means of making teachers more accountable to schools. A study in Indonesia found that although the scope of school-based management is limited, when effectively implemented it has led to hiring of teachers by the school, increased teacher attendance and in turn to improvements in student outcomes (Chen 2011). In the non-formal models used by BRAC and Save the Children, communities were involved in the selection of their teachers. This system appeared to have many benefits. However, Sullivan-Owomoyela and Brannelly (2009) point out that community involvement in the selection of teachers can give rise to patronage and lower quality than might have resulted from a more independent process.

3.2.2   Classroom pedagogy and national curriculum

Changing teaching practice to make it more learner-centred has been a key priority of many education reforms (example UNICEF Child-Friendly Schools model). However, a number of important single country and cross-country studies (Guthrie, 2012; Agyei and Vooght, 2012; Schwiesfurth, 2013) have found that these approaches were difficult to implement because of lack of teacher preparation and support, and school conditions such as large class sizes and lack of resources. Guthrie's review (2012) of classroom reform in Papua New Guinea points to such difficulties and so does another (Agyei and Voogt, 2011) study of the implementation of a reform promoting new technology in mathematics teaching in Ghana. In a study of active learning pedagogies in post-conflict contexts in Afghanistan and Somaliland (USAID 2008), the authors found that whilst teachers did show signs of incorporating child-centred methods in their teaching, poor school infrastructure and poor supervisory

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language teachers over a four-year time span. A specific component of the plan, the Rwandan Teacher Development and Management (TDM) policy, specifically attempted to improve teachers' image, motivation, and retention by increasing teachers' pay and training incentives. TDM emphasised school-based teacher training approaches

support hindered effective implementation of such pedagogies. Westbrook et al (2013: 23) note that 'recent curriculum models in reforms range from outcomes- and competency-based to thematic, localised and accelerated curricula. These curricula are, however, not always successful in meeting their goals. ... Teachers are often not consulted in curriculum design; equally, parents may not accept the assumptions of the curriculum, posing a challenge for teachers attempting to implement it'.

A recent study of the transition of students from initial teacher training to school contexts in Pakistan (Westbrook et al, 2009) notes how the physical conditions, professional practices and cultural contexts of the schools within which they take up their first posts undermine their ability to implement teaching strategies they have learned during training in their classroom practice.

Pinnock (2009) notes that national curricula have a significant bearing on the quality of classroom teaching. Policy around the language of instruction can have a particularly significant impact. There is extensive evidence to show the potential learning gains from teaching early grades in the learners' mother tongue. But language policy, the availability of appropriate mother tongue learning materials and the availability of teachers with the necessary language and teaching skills, can all constrain the potential of mother tongue instruction being implemented in the classroom (Pinnock 2009).

3.3   Government teacher policy frameworks

Teacher policies are usually developed by the Ministry of Education and national and/or sub-national education stakeholders.

Teacher education policies may also be influenced by national development plans and strategies. National Teacher Policies shape teacher quality indirectly by determining qualification training and licensing as well as key aspects relating to teacher governance and management including recruitment, accountability systems, salaries, deployment, teacher professional development, and appraisal. Government policies about teachers can be conceived as enabling frameworks which impact on teacher quality in the classroom. Various dimensions of policy are explored below including teacher qualifications, curriculum, salaries, recruitment, employment and accountability paying attention to performance related pay and contract teachers in relation to issues of accountability.

3.3.1   Teacher qualifications

Governments need to set qualifications at a high enough level to ensure reasonable teacher quality, whilst taking into account the supply of suitably qualified individuals. The definition of what counts as a qualified teacher is thus context specific. However there is consensus particularly among international donors that quality education to all can only be achieved with sufficient numbers of adequately and highly qualified teachers (DFID 2010; Education International 2010, 2011; UNESCO 2012; UNICEF 2000). Minimum qualification requirements tend to change over time, so teachers employed in the past may not meet the criteria expected of new teachers, hence the need for the governments to invest in in-service professional development to ensure that teachers have the necessary skills required for positive learning outcomes. Aware of the need to upgrade teachers skills, different international donors are involved in teacher upgrading programs to bring existing workforces up to the new required minimum standard particularly in the developing countries (for example, the case of Indonesia, World Bank 2013). Such initiatives are providing data to guide future discussions on efficient and effective ways on teacher training.

While qualifications matter, in some instances, for example in post-conflict situations, the recruitment of academically able candidates may be constrained by the number of secondary school graduates

with good grades. In other contexts, there may be a surplus of secondary graduates but the salary and career prospects of teachers are not sufficient to attract the best candidates.

In Bangladesh, there has been some considerable success with the use of unqualified teachers who generally do not have the academic qualifications necessary to enter teacher training courses, and who are given short training courses before starting to teach. BRAC (formerly Bangladesh Rural Advancement Committee) recruited teachers to teach Grades 1 to 3 in non-formal classes. They selected teachers from among the more educated in the village, with preference given to women. Candidates received 12 days of training. Teachers were taught to stress comprehension rather than memorisation. Teachers also attended regular refresher sessions (Haiplik 2002). Save the Children has supported a similar model in its work in conflict-affected states. An evaluation found that the teaching in these non-formal classes was often of comparable quality (as measured by lesson observation and learning outcomes), or better than the teaching in formal schools with formally qualified teachers (Save the Children 2011).

Teacher qualification and certification processes are not always implemented in a way that ensures that good quality teachers are produced. In some systems, the link between teacher qualification levels and teacher knowledge (as determined by teacher assessments) is weak (for example, World Bank 2013 in Indonesia, ESSPIN 2011 in Nigeria and USAID 2006 in Pakistan). As noted above, having the necessary academic qualifications does not therefore always guarantee that a teacher has the knowledge and skills necessary to teach well (Bonnett 2008).

3.3.2 Teacher salaries

National Teacher Policies usually determine teacher salary levels which have implications for both the welfare and motivation levels of the current teacher workforce and for the calibre of new entrants into the profession. Mourshed, Chijioke and Barber (2010) conclude that teacher salaries need to be set according to the level at which an education system is at. They argue that:

› For systems progressing from poor to fair, incentives based on teacher performance appear most effective

› In systems moving from average to good, teacher base salaries should be comparable to per capita gross domestic product

› In systems that are excelling they should be significantly above this.

Whilst appealing in theory, examples of performance based pay being applied effectively at the national level are rare. Glewwe et al. (2011) found very few studies that measured the impact of teacher salary on learning outcomes in developing countries. Where impacts were measured, all were positive and were significantly so in two cases (out of six estimates). In a study of post-conflict Liberia, the International Rescue Committee (2007) found that teacher salaries and welfare were key to their performance. However, many teachers noted that their salaries and conditions of service, coupled with a lack of participation in policy development, were demotivating. Similar effects are noted by a survey by Education International examining issues that affect recruitment, supply and retention of teachers in Anglophone African countries- Gambia, Kenya, Lesotho, Tanzania, Uganda and Zambia. The study revealed a major decline in teacher status. Most of the erosion of the teachers' status was attributed to the low salaries and the poor working conditions of service under which they work (Education International 2007).

A randomised control trial to evaluate the impact of the additional remuneration associated with certification of teaching in Indonesia found that fewer certified teachers reported having second jobs or being concerned with their family's welfare. The study also noted that there was no evidence that

certification made teachers more likely to participate in teacher working groups, teach more hours, or self-report to be absent less often. There was no measurable effect on student outcomes (World Bank 2013). Low salaries is often given as a reason for high levels of teacher absenteeism, but increasing salaries does not appear to reduce absenteeism in the short term (Abadzi 2007).

A systematic search of literature (Carr et al. 2011) on the impact of increasing salaries on improving the performance of public servants, including teachers, doctors/nurses, and mid-level occupations, in low- and middle-income countries initially identified over 28,000 records but found only one that met the strict review criteria. This single study (Menezes-Filho and Pazello 2007) reported a significant improvement in Brazilian students' grades when the base salaries of their teachers were higher.

In fragile and conflict-affected states, one of the major barriers to an effectively functioning teacher workforce is often a poorly functioning mechanism for paying teachers (Winthrop et al. 2012). When teacher payrolls are not well managed or matched to the actual teachers working in schools, this can lead to huge inefficiencies and wastage of education spending. Poorly designed payment delivery systems mean that teachers have to spend large amounts of time travelling to collect their salaries, leading to huge losses in teaching time. Support to teacher salary systems is an area for great potential impact by international development partners. The deployment of teachers in hard to reach rural areas also depends on ensuring that they are adequately remunerated. Different donors are responding to this need by helping developing countries pay teachers better and deploy teachers in the hard to reach areas (example in Ghana, DFID is providing funding to the government to pay teachers higher salaries) (DFID 2010).

On balance, the evidence suggests that paying teachers appropriately is key to quality teaching as it impacts positively on their motivation. The evidence is mixed on the degree to which raising teacher salaries impacts on classroom practices and its context specific nature make the findings of the empirical studies difficult to generalise. In spite of such differences, similar questions arise in all countries about better pay and the status of teachers which call for the application of a set of common standards to ensure that teachers enjoy the status and are paid commensurate to their role (ILO et al. 2001; ILO/UNESCO 1996; UNESCO/ILO 2003). Moreover, it is important to ensure that teacher salaries are efficiently administered and paid on time as this is likely to have an effect on morale and motivation (Bennell and Akyeampong 2007).

3.3.3 Teacher recruitment and deployment

The systemic development of teacher quality is dependent, first and foremost, on effective teacher recruitment strategies to attract good quality entrants into teaching.

For effective and efficient use of teachers, it is important that teachers are deployed to where they are most needed. The use in policy making of good Education Management Information Systems (EMIS) and application of the data from these systems can be effective in ensuring effective deployment of teachers (Barrett et al. 2007). It is often difficult to recruit teachers to work in rural areas. A range of monetary and not-monetary incentives have been used across a wide range of developing contexts, but evidence of the cost effectiveness of the various approaches is limited (McEwan 1999).

It is also important to ensure that the composition of the teaching force reflects the diversity of the learners. Ensuring that there are enough female teachers in schools has been shown to be an effective strategy for increasing girls' access to basic education (Lloyd 2009) and can also contribute to improved learning outcomes for girls in context where girls tend to underperform (Plan UK 2013). Recruiting female teachers can be a challenge in rural and conflict-affected contexts where few girls

graduate from secondary school (for example, Andrabi, Das and Khwaja 2011). Having a teacher of the same gender and ethnic background as the learner can raise student outcomes (Aslam and Kingdon 2011). In multi-lingual societies, recruiting teachers with the same mother tongue as learners also needs to be taken into consideration (Pinnock 2009).

Supporting effective teacher workforce management by donors can and should include strategies and interventions to deploy teachers in hard–to-reach areas as well as supporting national governments to develop rewarding conditions of service for teachers, ensuring that they are adequately remunerated. Donor partners are working together particularly with UNESCO through Quality Teachers for Education for All (EFA), Taskforce on Teachers for EFA and the Capacity Development for All (CapEFA) strategies which focus on developing institutional capacity for training and developing a high quality teaching force in countries most hampered by the lack of teachers. A major initiative is the development of eAtlas of Teachers by UNESCO Institute of Statistics (UIS). Through maps, charts and ranking tables it is possible to identify and project areas of need.

3.3.4 Teacher accountability

The World Bank (2012) identifies the monitoring and evaluation of teachers as a critical determinant of teacher quality. Teacher accountability is important to counter teacher absenteeism and ensure that teachers apply their knowledge in the classroom. National level policy may impact on teacher accountability in relation to developing strategies on contract teachers and the impact of performance related pay on which there is a growing evidence base with mixed findings.

3.3.5 Performance related pay

Performance related pay is often promoted as a means to increase teacher accountability (for example, Bruns, Filmer and Patrinos 2011). Mourshed, Chijioke and Barber (2010) recommend it as a strategy in poorly performing education systems. A study on performance related pay in India (Muralidharan 2012) found that individual teacher performance pay had a large and significant impact on student outcomes over the duration of student exposure to the program. They also found that individual teacher incentives significantly outperformed group teacher incentives over five years, though they were equally effective in the first year of the experiment. A study of a program in Kenya (Glewwe, Ilias and Kremer 2010), where teachers received financial incentives on the basis of student examination scores, found that the program led to significant increases in examination scores. However, the mechanism through which it worked was unclear since there was no observable impact on teachers' attendance or teaching practices, except that teachers did conduct more examination preparation sessions. Improvement in student outcomes did not last beyond the life of the intervention. Performance related pay can be difficult to implement particularly as it can undermine teachers' work, morale and labour and be opposed by unions (Roberson 2013).

3.3.6 The employment of contract teachers

Contract teachers (also called temporary, para- and community) teachers are considered in some contexts to be more accountable. In context with a surplus of qualified teachers, many contract teachers are certified. A systematic review of research on contract and para-teachers (Kingdon et al. 2013) included an in-depth analysis of 17 studies, around half of which were from India. The evidence indicated that contract teachers were generally more effective in improving student outcomes than regular teachers. Evidence from randomised control trials in India (Muralidharan and Sundararaman 2010) and Kenya (Duflo, Dupas and Kremer 2011) suggest that employing additional contract teachers can be a cost-effective way to increase student outcomes in the short term.

Contract teachers were less likely to be absent, so spent more time teaching. In a study of student test scores, it was noted that the presence of contract teachers is associated with positive effects in Mali, somewhat mixed in Togo and negative in Niger (Bourdon et al. 2007).

The research evidence seems to indicate that contract teachers may have a positive effect on the whole on student outcomes. This may be due to the conditions of employment. It is possible that contract teachers have greater incentive to ensure positive learning outcomes than their civil servant counterparts because their contracts are more easily terminated, and the consequences of poor performance are much more severe. It is also likely that locally-contracted teachers have a positive effect on student outcomes not because of their contract but because they have better knowledge of their learners and are more accountable to the local community.

However, the long-term sustainability of maintaining two groups of teachers with very different conditions of service is doubtful (UNESCO 2008). Moreover, there are also implications for the professional status of teaching and for the labour rights of teachers as codified in the principles of the International Labour Organization (ILO). Ultimately, the key issue is not whether teachers are on contract or not, but how robust the forms of monitoring and accountability are and the type of contract. Evidence that short-term contract teachers sometimes perform better than civil service teachers can be seen to be indicative of the need to reform civil service teacher recruitment and accountability, rather than an endorsement of the use of short-term contracts in teaching.

Furthermore, findings regarding the use of low-cost contract teachers need to be considered in parallel with other literature regarding the need for supportive school environments for teachers. There remains almost unanimous agreement among academics and policymakers that, in terms of factors that the school is able to control, student outcomes are significantly impacted by the quality of teaching. Policies aimed at attracting and retaining effective teachers need both to recruit competent people into the profession, and also to provide support and incentives. A supportive environment for teachers and students is vital to improving learning outcomes. Initiatives that decrease job security, fail to provide adequate professional development and capacity building for teachers and rely predominately on high-stakes testing for performance measurement are unlikely to provide a supportive teaching environment.

To conclude, well informed and context-responsive policy choices on a range of issues – teacher governance, qualifications, salaries, recruitment, deployment and accountability - have significant potential to impact on teacher quality. Policy development provides the opportunity to build consensus and strategise for action to lever changes in many systemic frameworks that impinge on teacher quality and quality teaching in the classroom.

4 International influence and engagement with teacher quality

The context for national teacher quality is often influenced by an international context as agenda setting for national policy is influenced by International Agencies who bring ideas and policies on teachers and teacher quality.

The right to quality education for every child can only be achieved if there are sufficient numbers of adequately and highly qualified teachers (Education International). This requires sufficient and quality teacher education institutions and continuous education and lifelong facilities for all teachers. However, the teaching profession today faces two major challenges, of both numbers and quality. With an estimated 1.7 million new teachers required to reach universal primary education by 2015, the recruiting of new teachers must go hand in hand with improving the quality of teaching and learning (UNESCO). Achieving quality education for all, in line with Goal 6 of the Dakar Framework for Action, calls for more and better trained teachers, as pedagogical processes lie at the heart of quality education. Equally, schools must be supported in attracting qualified teachers.

Developing teacher policies that promote teacher quality and improve student learning is seen as a top priority in reaching education for all (EFA) by 2015 and in achieving Millennium Development Goals (MDGs) 2, with different individual as well as collective initiatives being pursued at global level and country levels indicated in the table below. Key among these include: bilateral donors such as Department for International Development (DFID), United States Agency for International Development USAID and Japan International Cooperation Agency (JICA), multilateral agencies such as United Nations Educational, Scientific and Cultural Organisation (UNESCO), and United Nations Children's Fund (UNICEF), World Bank, NGOs such as Educational International (EI) and Monitoring agencies such as UNESCO Institute for Statistics (UIS). These initiatives are summarised in Appendix B.

International agencies influence teacher quality in a variety of ways: policy dialogue with national governments about education sector priorities; supporting governments to develop national policy frameworks for teacher quality; and financing teacher quality initiatives, as demonstrated later in the case of the Australian aid program. International agencies' capacity for influence depends on the type of partnership they have with national governments and the modality of aid. One major player in teacher policies and programs in the donor context is the World Bank SABER-Teacher initiative. SABER-Teacher provides a framework for analysing teacher policies in education systems around the world in order to support informed education policy decisions. The ultimate objective is to develop a knowledge bank through which interested stakeholders can access information regarding what education systems around the world do in terms of teacher policies, as well as assessments of the extent to which these systems put in place teacher policies that are evidence-based and related to improved student achievement (World Bank 2012).

5   Conceptual framework

The literature review has considered teacher quality in relation to professional development, the school environment, national government teacher policy framework, and the influence and engagement of international agencies. These dimensions of teacher quality are presented in the figure below identifying the various and interconnected levers of change for effecting teacher quality. It recognises that the processes involved address distinct but inter-related processes of institutional change (at national governance, teacher training and school institution levels), as well as individual changes in the adults who are training to be or are already teachers.

Figure 1   Conceptual Framework: Teacher quality and the factors that influence it
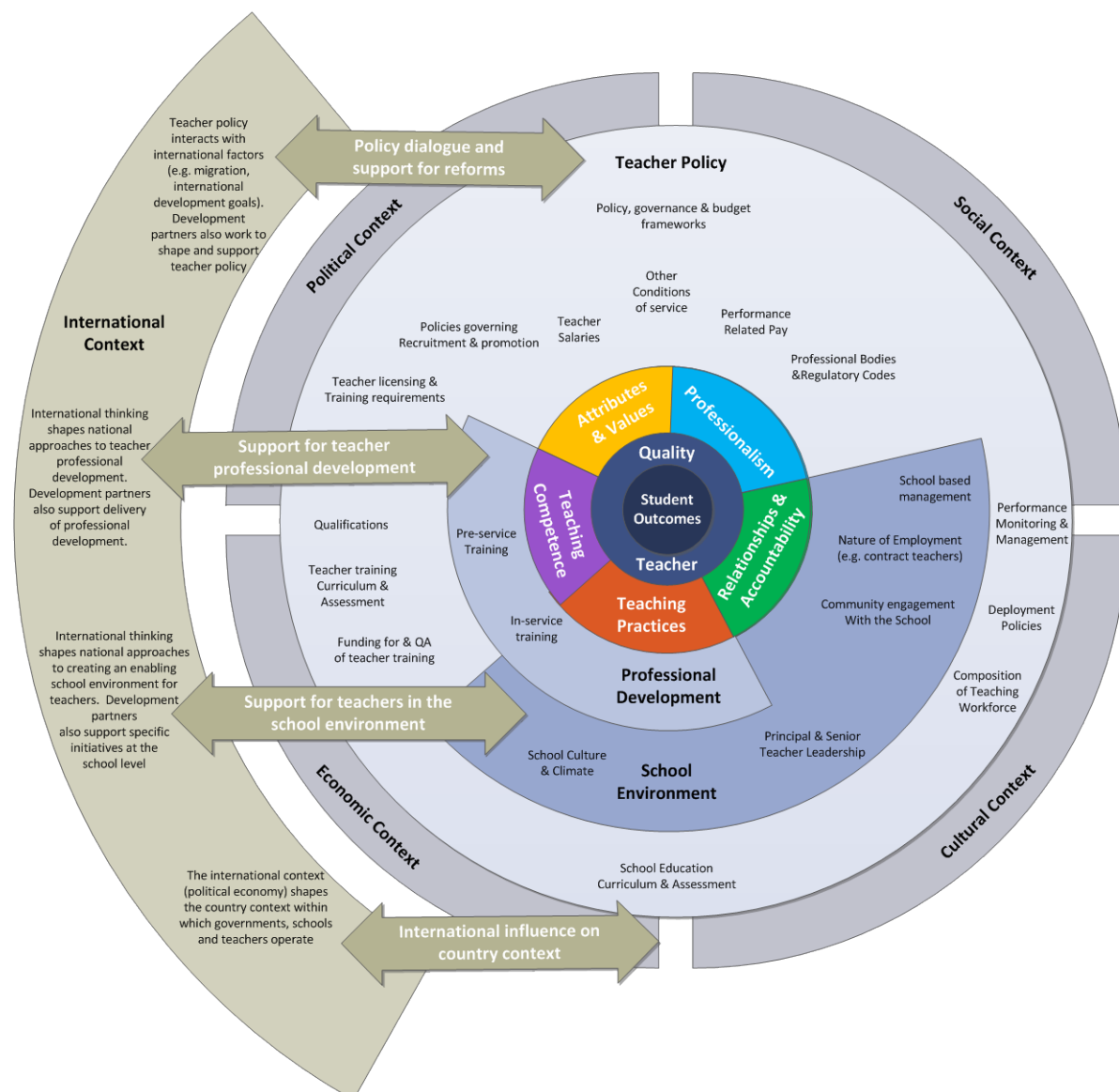
6   Methods of evaluating teacher quality

Deciding how to measure teacher quality depends, as noted earlier, on what the conceptual frameworks and meaning of quality is. The indicators used to measure teacher quality will depend on the various conceptual frameworks applied. The most widely agreed outcome of quality teaching is learning, and student learning assessments are frequently used to measure this. Thus, the most widely used measure of teacher quality is students learning outcomes obtained through student learning assessments. National examination results are usually used to measure student outcomes and to correlate with teacher quality.

Teacher knowledge is usually measured through their qualifications. In countries with weak certification and quality assurance procedures these can be an unreliable predictor of teacher quality. In more recent times (Cochran-Smith 2005) teacher tests have become more common. Examples include the teacher certification system in Indonesia (World Bank 2013), and a teacher assessment in SACMEQ where teachers sit the same test as students to assess their subject knowledge (Spreen and Fancsali 2005). A Teacher Development Needs Analysis used in Nigeria assesses both content and pedagogic knowledge (ESSPIN 2011).

One way to measure the quality of teachers in the classroom is to observe their classroom practices. However, this is practically and methodologically challenging. Methodologically, the presence of an observer can impact on the behaviour of teachers and students. Whilst observation schedules can be designed to be as objective as possible, written records of a lesson will always include some degree of subjective reporting by the observer. These effects can be mitigated (though not overcome entirely) through videoing lessons which can reduce the observer effect and enable several researchers to review the lesson and to apply and verify coding consistently. The TIMSS video studies[7] (World Bank 2010, example from Indonesia) link data on teacher background and student outcomes to data on teacher behaviour in the classroom. This provides a powerful methodology for evaluating the linkages between teacher preparation (for example, training received and qualifications), teacher performance and student learning.

Teacher questionnaires can provide useful data on their qualifications, training, professional development instructional beliefs and pedagogical practices as well as ascertain their perception of school leadership and climate. See for example OECD (2011) which draws on the Teaching and Learning International Survey (TALIS) data set.[8]

Direct measures of teacher quality which are based on classroom observation are usually the most authentic, reliable and robust. All other measures and methods, whilst important, provide a proxy method of judging teacher quality. Whatever approach to teacher evaluation that it is adopted, it is

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[7]   See http://timssvideo.com/timss-video-study for further examples.

[8]   See http://www.talis.org.uk/about/index.aspx

important that teachers themselves are involved in designing the system and its implementation. Only in this way can teachers feel a sense of ownership and commitment to the appraisal and evaluation process. Moreover, any evaluation of teaching quality should be cognisant of the other context-specific factors that can influence this (primarily student background and prior learning, school infrastructure and resources).

7 Evidence gaps and implications

The review has provided a commentary and analysis of the current evidence base for three main issues relating, directly and indirectly, to teacher quality – policy, professional development and school contexts. This section identifies several evidence gaps which an evaluation of the influence of aid on teacher quality can address and which are important to consider:

1. First, any evaluation needs to better understand the impact of policy changes on teaching quality and student outcomes. Specifically, a future evaluation should consider what policy changes are most effective for improving teacher quality and student outcomes. This could cover aspects such as the impact of performance related pay and salaries on teacher quality. Evaluation of policy should also consider the realities of implementing policies and policy work in the diverse country contexts in which Australian aid works ranging from small states to large and fragile and conflict affected contexts. Policy evaluation should also consider the refinement of systems to manage teachers to ensure effective classroom practice

2. Second, evaluation could also focus on examining the investment in teacher professional development (pre and in–service) and their impact on teacher quality and student outcomes. Within such a focus, attention could focus on considering which models of professional development are more effective, what kinds of support are and should be provided to teacher training institutions for the reform of teacher education and to what extent is Australian aid's investment in professional development consistent with and based upon global evidence about good practices

3. Third, evaluation should pay attention to what specific aspects of the school environment in low resource contexts shape teacher performance in enhancing student outcomes and consequently, what investments should be made by DFAT. Such an evaluation should therefore aim to look at changes in the school environment such as decentralised school governance and school leadership and how these impact on teacher classroom performance and consequently student outcomes

4. Fourth, future evaluation should consider which aid modalities are more effective for investments in teacher quality that impact on classroom practice, particularly in low income contexts. This may entail considering the differences between project-related aid versus direct budgetary support for government. Such a review could also consider the impact of technical assistance on DFAT investments in teacher quality. This evaluation should address the political, social, and economic context of the countries in which aid investments are being used for teacher quality.

Some of the possible areas for future evaluation regarding teacher quality are summarised in the table below:

Table 1   Areas for future evaluation

Area of evaluation	Possible evaluation topic
Professional Development	› The impact of in-service and pre-service teacher education and training interventions on teacher's classroom practice as well as student outcomes
	› Evidence of the effectiveness of national and international agency investment in innovative strategies to support the professional development of teachers
	› Effectiveness of the new teaching approaches e.g. active based learning on teacher practice and student outcomes
	› Examining models of teacher professional development, which integrate pre-service initial training with in service interventions
	› Examining partnerships initiatives between schools and teacher education institutions may be strengthened to enhance effectiveness of teacher professional development
	› Investigating the effectiveness of teacher quality initiatives in post-conflict contexts
School level support	› Understanding the effectiveness of head teachers training and the impact on teacher quality
	› Examining the efficacy of school level monitoring and teacher governance on teacher classroom practice and student outcomes
Government teacher policy frameworks	› Examining the impact of specific governance policies e.g. national teacher standards, codes of conduct, data systems on teacher performance in the classroom.
	› Investigating how aid can influence teacher quality in different aid modalities (budget support, pooled funding and projects).

All evaluations need to take equity considerations into account, examining whether all children have access to quality teaching, examining geographic, gender, economic, disability related, ethnic and linguistic dimensions of inequality. Moreover, future evaluations should take into account whether current DFAT investment, particularly in scholarships, can be linked to the enhancement of teacher quality.

8   Conclusion

Whilst the literature review has focused on teacher quality in relation to learning outcomes, it needs to be recognised that there are other factors that influence learning including students' background as well as societal factors. Teachers do have a key role to play in student learning but they cannot be expected to compensate for or overcome deep-seated historic and structural inequalities in society. The review also indicates that efforts to improve teacher quality should be context specific as the findings from different contexts also underline the point that what constitutes teacher quality is highly context dependent. Any evaluation of teacher quality therefore needs to consider context and ensure that evaluation tools, methods, and indicators are adapted for the local situation. Caution needs to be exercised in promoting global approaches to education reform to enhance teacher quality as well as their evaluation. Nonetheless, the review does highlight the central role teachers' play in enhancing student outcomes.

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Appendix A: Search criteria and grading

A.1 Search engines/ sources

› ADEA

› ELDIS

› ERIC

› UNESCO http://www.unesco.org/new/en/unesco/resources/online-materials/publications/unesdoc-database/

› World Bank https://openknowledge.worldbank.org/

› INEE http://www.ineesite.org/en/annotated-bibliography-teacher-professional-development-in-crisis

› Abdul Latif Jameel Poverty Action Lab https://www.gov.uk/government/publications

› DFID Publications https://www.gov.uk/government/publications

For both stages it is important to search for material including:

1. Small and large scale evaluation studies of teacher education/teacher quality/teacher effectiveness

2. Small and large scale evaluation studies of donor aid for education

3. Small and large scale studies of donor aid for teacher quality/teacher education/teacher effectiveness

4. Small and large scale evaluation studies of international agency (by this is meant bilateral agencies such as UNICEF, UNESCO) support for teacher education/teacher quality/teacher effectiveness.

    i. effectiveness.

Stage 1: Overview literature of factors associated with teacher quality and effectiveness: global reviews and investigations of global data sets

Search parameters:

› literature from 1995 onwards

› primary, secondary

› studies should be meta-studies reviewing other studies or multi-county studies using international data sets

› multi-country must include some low- to middle-income countries (using World Bank categorisation: http://www.gfmag.com/tools/global-database/economic-data/12066-countries-by-income-group.html#axzz2Z7SVAfL3)

› if single country must be low- or lower- to middle-income

- › studies in fragile and conflict-affected contexts should be included where possible, other search criteria should be relaxed if necessary
- › key words:
  - » teacher quality
  - » teacher effectiveness
- › key international data sets: TIMSS, PIRLS, PASEC, SACMEQ, PISA
- › studies should discuss evidence of outcomes in terms of at least one of:
  - » student learning
  - » teacher knowledge
  - » teacher performance
  - » teacher attendance
  - » distribution of teachers particular in relation to hard to each areas

Stage 2: Specific search for evidence of key strategies to increase teacher quality and effectiveness, focusing on those where international aid has the greatest potential influence

Search parameters:

- › literature from 1995 onwards
- › basic education or teacher training institutes
- › international aid involved in some capacity
- › for multi-country studies, should include some low- or lower- to middle-income countries
- › for single country studies, only include low- and lower- to middle-income countries in Asia and the Pacific
- › studies should present evidence of outcomes in terms of at least one of:
  - » student learning
  - » teacher knowledge
  - » teacher conduct
  - » teacher performance
  - » teacher attendance

Teacher professional development:

- › Studies should consider input variables around teacher preparation and professional development including:
  - » teacher academic qualifications
  - » initial teacher training/training qualifications
  - » teacher subject knowledge
  - » teacher pedagogic and pedagogic content knowledge
  - » induction programs for beginning teachers
  - » teacher study groups
  - » teacher mentoring/coaching

- » in-service teacher training
- › note here the distinction between intima, induction and continuing support

Key words:

- › the above plus:
  - » pedagogic strategies
  - » teaching practice
  - » curriculum
  - » teaching practice/practicum
  - » donor support for teacher education (including pre-service, in-service, upgrading, unqualified teachers)
  - » learner-centred pedagogy
  - » teaching methods

Studies in fragile and conflict-affected contexts should be included, other search criteria should be relaxed if necessary.

Teacher accountability

- › studies should consider input variables around teacher accountability including:
  - » school involvement in teacher appointments
  - » teacher evaluation/teacher appraisal
  - » teacher conditions of service
  - » teachers and social accountability

National policies

Under this dimension various additions were proposed:

- » teacher salaries
- » teacher certification
- » teacher career path/structure
- » teacher deployment
- » match between supply and demand
- » teachers' salaries
- » distribution of teachers particular in relation to hard to each areas
- » teachers workload

Table 2   Grading

Grade	Criteria for single studies	Criteria for reviews
High (1)	Most appropriate methodology for the research questions asked. Analysis method, measurement tools and data presented/available. Clear methods of data validation and triangulation presented and applied. Representative sampling techniques. For qualitative research coving a wide range and large number of institutions/ stakeholders. For evaluative studies making claims of causality, using a randomised control group or comparison group design.	Systematic review of global literature. Reviews predominantly high/medium quality studies. Clear search and grading criteria and presentation of quantitative findings.
Medium (2)	Suitable methodology for the research questions asked. Sampling methodology clearly explained; for quantitative analysis, large scale data analysis; for qualitative research covers a range of institutions/stakeholders. Comprehensive review of literature or evidence synthesis. Evidence justifies the conclusions.	Extensive review of global literature but search and/or presentation of findings not fully systematic. Full references given, predominantly high to medium grade studies.
Low (3)	Limited detail given on methods. No literature review, small sample size. Conclusions not fully justified by the evidence.	No methodology for literature search given. Few high grade studies included. Includes a predominance of medium to low sources.
Poor (4)	No detailed information given on methods; based on the views of one person; or opinion-based.	Includes a low number of studies. Incomplete or no references given.

Appendix B: Donor engagement in policy and programing of teacher quality

Donor Partner	Initiatives	Aim	Indicators	Programing
World Bank	System Approach for Better Education Results (SABER)	To provide a comprehensive, evidence based approach to understanding and assessing teacher policies	8 teacher quality goals: 1. Requirements for entering and remaining in the teaching profession; 2. Initial teacher preparation, 3. Recruitment and employment, 4. Teacher workloads and autonomy, 5. Professional development, 6. Compensation: salary and non-salary benefits, 7. Retirement rules and benefits, 8. Monitoring and evaluation of teacher quality, 9. Teacher representation and voice 10. School leadership.	› Used in Nigeria to help states identify priorities for reform in preparation for the $150 million State Education Investment Project (SEPIP) › Used in MENA region to carry out a region wide analysis of teacher policy in six countries. Used to map out broader patterns in the region.
DfID	Learning for all: DFID Education Strategy 2010-2015	Improving quality education through teacher training and working conditions Publications of policy guidance on improving teaching and learning	Salaries for teachers	In Ghana DFID provides funding to pay teachers higher salaries
JICA	SMASSE- in-service training (INSET)	Improve the way teachers organise mathematics and science classes. Aims to train 100,000 science and maths teachers Use SMASSE platform for exchange of ideas	Trained teachers on student-centred approaches to teaching maths and science	Trained 20,000 science and mathematics teachers in Kenya Formation of SMASSE-WECSA Association network In-country SMASSE programs in each of the 16 countries in the SMASSE-WECSA

Donor Partner	Initiatives	Aim	Indicators	Programing
UNESCO	Quality Teachers for EFA	Address challenge of inadequate number of teachers and their quality	Policies implemented on teacher initial and continuous training, recruitment, retention, status and working conditions. Institutional capacity for training and developing a high quality teaching force	UNESCO working in different countries particularly developing countries to: › Policies on teacher initial and continuous training, recruitment, retention, status and working conditions. › Institutional capacity for training and developing a high quality teaching force
	Supporting Teachers for Quality Learning (2012-2015)	Addressing emerging challenges and supporting teachers for quality learning	National capacities Teacher training institutions and teacher educators Policy formulation, monitoring and implementation Developing standards for teachers Informing global debate, generating research and knowledge on effective teaching	Working International Task Force on Teachers for EFA and the Capacity Development for Education for All (CapEFA) programs
	Task Force on Teachers for EFA	Assist countries to address the teacher gap	Policies Capacity Financing	Globally

Donor Partner	Initiatives	Aim	Indicators	Programing
	eAtlas of Teachers-UNESCO Institute for Statistics (UIS)	Provides a picture of the gaps in the supply and demand for teachers at national and global levels	Gaps in teacher Gender balance Internal efficiency in primary education National education strategies Financing National related teacher programs	Globally Compiles data for more than 200 countries and territories through annual surveys and partnerships with Economic Co-operation and Development (OECD) and Eurostat › new indicators on school conditions and teaching resources in sub-Saharan Africa collected through a regional survey; › projections on the global demand for primary teachers updated on a yearly basis; and › data on the working conditions and characteristics of teachers in 60 selected countries.
UNICEF	Supports the United Nation's Secretary General's Global Education First Initiative (GEFI),	Address shortages of qualified teachers, teacher absenteeism and lack of qualifications	Supportive teacher environments Qualified teachers Adequate teacher training and safeguards or the right of teachers	Improved teacher methodologies in child-centred learning, inclusive education and competency-based curricula in different countries e.g. Angola, Mali, and Niger › In Mali, teachers were trained to support child victims of gender-based violence. › Ethiopian teachers working in disaster-prone regions in education in emergencies and disaster risk reduction.
Multiple	Global Education Partnership (GPE)	Goal 4 is to build national capacity and integrity to deliver and assess good quality education	› Finding more qualified and effective female teachers and achieving greater gender parity in school and system management › Monitoring the percentage of staff members in management positions in the senior sector who are women; supporting qualified teachers who are equipped with the right approaches to teach reading and numeracy. › Improve teacher effectiveness by training, recruiting and retaining teachers and supporting them to provide a good quality education'	Between 2002 and 2011, more than 413,000 teachers have been hired in GPE partner countries Zimbabwe received a US$23.6 million (RM72.3 million) grant from the Global Partnership for Education (GPE) to fund training of teachers. (May 2013)