

Are contract and para-teachers a cost effective intervention to address teacher shortages and improve learning outcomes?

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CHAPTER ONE

1 Background

1.1 Aims and rationale for current review

Contract teachers have become a central part of schooling reforms and expansion over the last fifteen years. Their use is widespread across Africa and South Asia and in some parts of Latin America. The extent to which teachers have been hired on 'fixed term' contracts varies substantially by country. For example, contract teachers constituted 20 percent of the total teaching force in Chile, 11 percent in Peru while up to half the teaching force in Western Africa is believed to be hired on a 'contract' basis (Duthilleul 2005). At their peak, they constituted about 9% of the total teaching force in primary schools in Cambodia (Geeves and Bredenberg, 2005). In India for example, para (contract) teachers accounted for 9.4 % of the total number of elementary school teachers based on DISE (District Information System for Education) 2009. The officially stated rationale for provision of contract teachers is to achieve three major equity and efficiency aims in an affordable way: expanding access to schooling in un-served communities; eliminating single-teacher schools and relieving multi-grade teaching; and reducing high pupil teacher ratios. The rationale for hiring teachers on 'fixed term' contracts is not just a relatively more flexible response to urgent schooling needs (such as providing teachers to students in remote rural areas or ethnic minorities for instance) which are often not met through the slow-responding teacher deployment system in many countries with government teachers on permanent contracts. Some of these problems stem from the inability of existing government systems to respond to changing student enrolments and staff vacancies/long-term illnesses while others arise because the mechanisms needed to effectively staff remote, hard-to-reach areas either do not exist or are ill-functioning in many developing countries. Governments hiring regular teachers on permanent contracts find themselves constrained to meet changing needs. Increasingly, the hiring of contract teachers is also believed to be a cost-saving strategy among financially constrained governments. While regular government school teachers are hired on permanent contracts with salaries often linked to the civil-service pay-scale, contract teachers are hired on fixed-term contracts (annually renewable or otherwise depending on the country with the provision that their contracts can be made permanent after an interim period in some countries) and are paid a fraction of what regular teachers are paid (and are often less qualified than their regular counterparts). While initially these contracts were drawn up to meet teacher shortages mainly in primary schools in rural areas and especially for remote locations, they are increasingly used to respond to larger student enrolments, substitute teachers on leave and even replace teachers when official vacancies are not filled (Diaz and Saavedra, 2002 cited in Duthilleul 2005).

Whilst on the one hand they may provide a low cost way to address rising student populations, budgetary constraints and high costs of regular teachers, the hiring of contract teachers may raise equity concerns as they are often appointed in remote rural schools that tend to serve more disadvantaged students (e.g. child labourers, small habitations, tribal children or ethnic minorities). This raises the concern that social inequality may be exacerbated if contract teachers are found to be less effective in imparting learning than regular teachers.

In many developing countries, contract teachers are hired at the local as opposed to the state level. For example, in China contract teachers hired directly by the local community represented approximately half of all teachers in primary and secondary education in 1980. Similarly, in Nicaragua, education decentralisation has been promoted and teachers are employed by the school council rather than by the Ministry of Education (Duthilleul 2005). The practice of hiring teachers from within and by the community is often driven by a desire to increase accountability particularly in countries where evidence on teacher absenteeism and effort has raised concerns. In addition to this, locally recruited teachers are more likely to be socially and culturally similar to the students and parents in the schools where they teach. This reduction in 'social distance' between the teacher and the taught has been argued to have positive impact on student learning (Rawal and Kingdon, 2010).

Many developing countries have witnessed a mushrooming of the private educational sector in which all teachers are employed on a 'contractual' basis. For example private school enrolments accounted for 30 percent of all enrolments across all education levels in Pakistan and 60 percent of all institutions in urban Pakistan were reportedly privately owned (MOE, 2006). This rise in private schooling has resulted in many questions being asked about the nature of the contracts and governance environment surrounding teachers in government versus private schools. The 'effectiveness' of private schools in terms of student achievement has been studied in numerous settings and while the evidence is mixed, the balance is relatively tilted towards suggesting that private school students have better learning outcomes compared to their government school counterparts. This has led to discussions surrounding the nature of existing systems for teacher recruitment, transfer, postings and promotions. It is argued that regular government school teachers suffer from a lack of accountability and a lack of incentives for meeting even the minimum requirements - turn up for work and teach classes - let alone undertake creative and innovative teaching. In many developing countries the existing salary systems reward experience gained through age and not performance or responsibility. One of the key issues that raises its head across many developing countries is that once recruited, government school teachers are virtually unsackable. This, however, is not true for private school teachers and certain other types of teachers (para/contract and community teachers in Bangladesh for instance, and temporary teachers in Nepal). Thus, teachers' attitudes and effectiveness can vary depending on the incentives they face. Having 'jobs for life' crucially alters incentives and hence teacher effectiveness. It is therefore interesting to compare the effectiveness not just of

contract teachers in government schools with their regular counterparts but also to compare the effectiveness of teachers employed on a contractual basis in both private and public sectors. This will provide an insight into the impact on outcomes not only of being employed on contractual basis but also whether differing contractual obligations and the surrounding wider contextual factors affecting the educational setting also matter and to what extent. It should be mentioned that the scope of this review does not extend to the efficiency versus effectiveness of private versus government education. We only aim to ask whether the contractual basis under which government teachers are employed are more effective than those under which private teachers are employed.

Rigorous evaluations on the effectiveness of contract teachers are relatively scarce. The limited evidence that does exist provides mixed results. More recent empirical research is based on data from India where the phenomenon of hiring contract teachers has gained attention. These studies - Atherton and Kingdon, 2010, Goyal and Pandey, 2009, Muralidharan and Sundararaman, 2010- suggest that contract teacher perform no worse than regular teachers (as measured by their students' outcomes) and in fact may well outperform regular teachers. Studies in other developing countries provide very mixed results. For example, Duflo, Dupas and Kremer (2009) find that in Kenya students taught by randomly assigned contract teachers have higher test scores than their counterparts taught by regular teachers. Another study by Bourdon et.al. (Bourdon, Froelich and Michaelowa 2010), investigates contract teachers and their effect on education in Africa (Mali, Togo and Niger). They find that contract teachers tend to reduce inequalities in student outcomes. Overall, they find that the effects of contract teachers on student achievement are positive in Mali, somewhat mixed in Togo and negative in Niger. Earlier studies of individual African countries have also produced such divergent results. This differential effectiveness of contract teachers in the countries studied, Bourdon et. al. argue, are due to differences in how the contract teacher programs were implemented in each of these countries, with positive effects found where contract teachers were managed through local communities and negative effects where contract teacher hiring was centralised. Given that teachers are the most important input into schools, the relative effectiveness of contract and regular teachers is one of the most policy relevant and quality-focused issues in education today. On the one hand, their use provides a low-cost way for the state to increase the number of teachers in the face of rising student populations, budgetary troubles and rapid real increases in salaries of regular teachers. On the other, it raises educational quality and educational equity concerns.

The proposed question is: Are contract and para-teachers a cost effective intervention to address teacher shortages and improve learning outcomes? It can be thought of encompassing three sub-questions:

(1) How effective are contract teachers at imparting learning when compared to regular teachers?

(2) What are the relative costs of regular and contract teachers, and hence their cost effectiveness?

(3) To what extent do contract teachers succeed in addressing teacher shortages?

1.2 Definitional and conceptual issues

Here we outline and define the key issues that will be addressed in this review. A Systematic research synthesis requires explicit and precise definitions so that the limits of the review are made clear prior to developing a search strategy.

1.2.1 Definitional Issues

Contract Teachers

We follow the IIEP (2004) and define a contract teacher as a teacher who is on a fixed-term rather than a permanent contract. We further define a contract teacher as a government employee, rather than a community-paid teacher.

Educational setting

Our main focus is on contract and regular teachers in government schools. However, should there be research that compares contract teachers in government schools versus those in private schools, these shall not be excluded. This is because DFID is evaluating mechanisms to support the private sector and so evidence around effectiveness of teachers in the private sector can prove extremely useful. This can be an especially interesting analysis because while all teachers in private schools are essentially 'contractual' employees as it can give some insight into whether the educational setting and differences in contractual obligations in the two sectors impact on outcomes. This is to enable the findings of the review to be applied by DFID and other donors to evaluate funding of contract teacher schemes by recipients of international aid through budget support. The focus will be on the use of contract teachers in primary schools, where they are most prevalent. Given the increasingly specialised nature of education at post-primary level, the impact of contract teachers will differ. This review is not intended to comment on such issues.

Low and middle-income countries

We will focus on low and selected middle-income countries only, as the nature of the report is to aid donor governments decisions in funding contract teacher schemes in recipient countries. We will not confine our countries to DFID aid recipients, as the choice of recipients is fluid and this excludes many countries where schemes exist or may be proposed in the future. We incorporate select middle income countries, as the majority of the world's poor now live in middle income countries (Sumner 2011). We use the following criteria to select our countries.

A three year average GNI per capita of less than \$1,086 or a three year average GNI per capita of less than \$3,500 but where 20% or more of the population live below the \$1.25 per day poverty line (see attached Appendix).

Educational outcomes

The review will cover studies which focus on cognitive educational outcomes, excluding any non-cognitive skills such as social, emotional and physical development skills. These can be both quality (cognitive test scores) and quantity (years of schooling, completion and progression rates). The review will also focus on the cost effectiveness of regular and contract teachers. In developing countries, teacher salaries constitute the major proportion of recurrent educational expenditure. Therefore, for example, cost-effectiveness of different types of teachers can be judged by comparing teacher salaries per achievement point for contract versus regular teachers.

1.2.2 Conceptual Issues

One of the main issues in the review is drawing a meaningful comparison of the relative effectiveness of contract and regular teacher effectiveness from studies which use differing methodologies, and examine different counterfactual questions. Care must be taken to ensure that only estimates which examine the same counterfactual are compared - such as studies which evaluate the “as is” status of contract teachers as measured in a randomised trial or in the reduced form estimate from survey data. The effects here will differ from those estimates which condition on teacher characteristics such as age, experience and qualifications, where the contract teacher effect is likely to be higher (as contract teachers are generally younger and less well trained). Contextual factors may also hinder comparisons - are contract teachers given the opportunity to graduate to regular teachers? How long are the contracts for? Who appoints the contract teachers, and to whom are they responsible? All of these factors will influence their effectiveness, and a contract teacher who has strong accountability incentives (e.g. as in Uttar Pradesh, India) may perform better than one with weaker incentives (e.g. in Bihar, India). A further problem is the effect on sub-groups of students - contract teachers may have heterogeneous effects, for example, they may perform relatively better when teaching pupils of the same economic standing or social group as themselves, which may be masked when the effects are aggregated across all student types. Furthermore, the findings from the review may contradict those from individual studies, which must be explained if the review is to form part of the evidence base. Finally, another issue is that, depending on the study and the context, the contract teacher ‘effect’ on child learning might in fact really be a class-size effect since the appointment of a contract teacher often leads to a reduction in class size at the level of the school

While these limitations may appear copious, the SR will aim to ensure meaningful comparisons where possible. This will be done firstly through stringent procedures to ensure the comparison of like with like. Secondly, robust exclusion and inclusion criteria will be enforced as will measures to guarantee screening only in accordance with the stringent validity criteria. Thirdly, clearly attributing causality or identifying the true contract teacher effect especially when it relates to student learning is challenging. This is especially true because comparing learning across different populations is not without pitfalls. Any study that attempts to overcome the methodological and contextual constraints discussed above is likely to meet the validity criteria and be part of the final studies selected for review.

1.2.3 Theory of Change of Contract Teacher Interventions

Figure 1 below sketches the theory of change of the proposed contract teacher effect studied in this review. The attempt is to identify the causal relationship between the type of teacher and the outcomes of interest. The first step in this chain is the 'intervention' i.e. the introduction of a teacher on a 'fixed term' contract. As mentioned before, these programs are likely to be introduced more in remote rural regions where regular teacher deployment may prove difficult and there is a need to address teacher shortages or where governments are especially keen to bring in cost-saving measures.

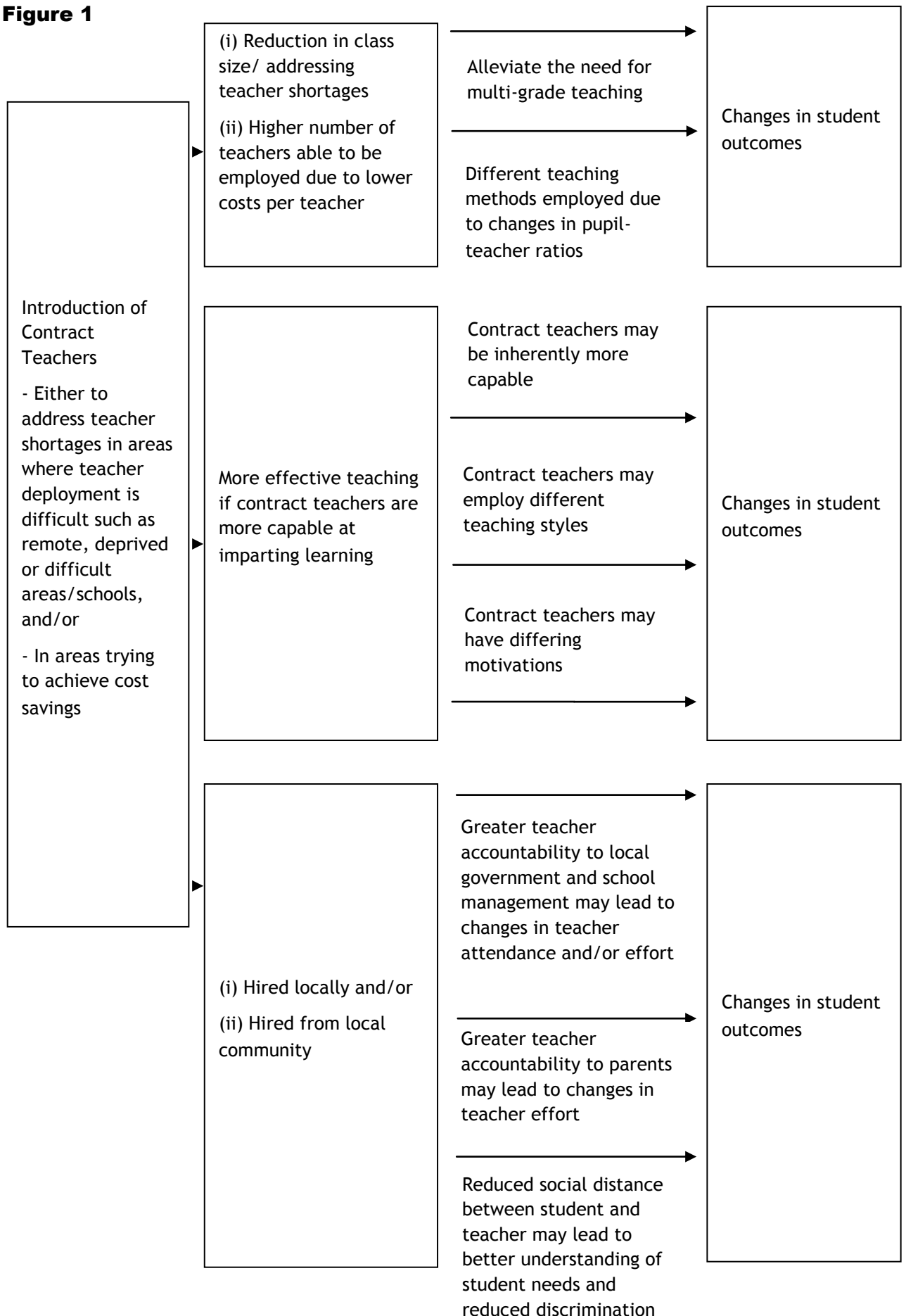
Theoretically, the introduction of contract teachers may improve student outcomes through various channels. There could, for instance be an immediate alleviation of teacher shortages or a reduction in class sizes which improves student outcomes (such as learning, grade progression, participation etc.. .). This could also be because contract teachers may be more cost-effective because they improve student outcomes at a lower per child cost or because a larger number of teachers can be hired with a given pot of money, resulting in alleviation of teacher shortages and improved student outcomes. Alternatively, contract teachers may simply be more effective for instance in their pedagogic approaches or their attitudes towards their students for instance if the 'social distance' between the teacher and the taught is less if they are recruited from the local community or because they are more accountable to the parents or the school etc.

There is also the possibility that contract teachers either have no effect on student learning or negatively impact student outcomes. This may happen for instance when the intended objective of reducing teacher shortages is met by hiring a lower quality pool of unqualified and untrained teachers. In some countries accepting a contract teaching job is the only way to attaining a regular teaching position. For example, anecdotal evidence from Togo suggests that contractual teachers are rarely, if ever, dismissed (Vegas and De Laat, 2003). In order for the contract to be effective in impacting performance positively, there has to be a credible risk of non-renewal or termination which in many instances is known not to exist.

The studies in the literature have variously looked at these different channels of effect. For example, Atherton and Kingdon (2010) find that contract teachers do no worse than regular teachers in imparting learning and may in fact be more effective. There is no evidence that this effect is driven by class size reductions i.e. the contract teachers are not only more effective because they work with smaller and mono-grade classes. The authors argue that one plausible reason for improved student outcomes under contract teachers could be because they are more accountable and that the social distance between the teacher and the taught is potentially reduced which helps improve student outcomes. The authors suggest that contract teachers are better value for money compared to regular teachers hired under permanent contracts. In comparison, Vegas and De Laat (2003) find that contract teachers in Togo systematically underperform (in terms of their students' outcomes) when compared to regular teachers even after controlling for student, household and school characteristics. They suggest that this variation is not due to teaching methods, teacher effort, and resentment over unfair pay but

instead due to policy reforms that have triggered a reduction in the quality of teachers hired on contracts.

Figure 1



1.3 Research background

Of the three questions, it is the first two parts which are of most interest to policy makers, and have attracted the most interest from researchers. The evidence base on the first issue i.e. whether contract teachers are more effective in imparting learning compared to regular teachers is well established, but of differing quality. For purposes of this first question, effective teaching is defined as teaching that leads to improvements in student outcomes. For the purposes of the review, student outcomes may be variously defined as learning, participation, grade progression etc. as measured by quantifiable improvements in the outcome of interest. Student learning is usually measured through standardized test scores on literacy and numeracy instruments designed to test a wide range of cognitive capabilities. Given the intended global focus of the review question, the authors are mindful of the fact that 'learning' is context-specific and any cross comparisons will be made with this caveat in mind.

Studies investigating the relationship between type of contract and student outcomes use a wide range of methodologies. While some studies rely on descriptive statistics (Pratiche Trust, 2002; Leclercq, 2002; Govinda and Josephine, 2004; EdCil, 2007, NCAER, 2008), others use OLS methodologies (Sankar 2008, De Laat and Vegas 2003, Froelich *et al* 2007) while others use more complex econometric techniques to deal with the endogeneity of the 'contract teacher' variable within the achievement specification (Atherton and Kingdon 2010). Several studies have used Randomised Controlled Trials (RCT) methods, permitting a strong causal interpretation of the contract teacher effect (Muralidharan and Sundararaman (2010), Duflo, Dupas and Kremer (2009)). Care must be taken when evaluating these studies to isolate what is actually measured by the contract teacher effect, differentiating 'conditional estimates' (which control for differences across regular and contract teachers in age, experience and qualifications) and the 'reduced form' estimates. In the second case we answer the question "what is the relative effectiveness of contract and regular teachers given their existing characteristics". This is an "as is" evaluation of the impact of contract teachers: for simplicity we call this the 'reduced form' estimate. In the first case we answer the question "what would the relative effectiveness be of contract teachers vis a vis regular teachers if they had the same observable characteristics". This corresponds to the policy question: "at the time of recruiting new teachers, what will be the effect on learning of these two different teacher types?" This difference between these two types of studies is key to our conclusions, and the literature must be evaluated with this in mind. The researchers are extremely familiar with this evidence base and have contributed to it personally.

The evidence on the second question relating to the relative cost-effectiveness of contract versus regular teachers is less well formalised. Considering that the largest proportion of recurrent educational expenditures in most countries is allocated to teacher salaries and the government remains the largest employer of teachers, an examination of cost-effectiveness would revolve around comparing the value for money for hiring a regular teacher versus a contract teacher for a given improvement in student outcomes. While hiring teachers on different

contracts is associated with economic and social costs (and benefits), only the former will be examined due to the difficulties in quantifying the latter. For example, while salary costs are often the most visible, there may be other social costs such as the cost for students for getting to know a new teacher and her teaching style for instance. There may also be additional economic costs such as costs to the schools of training contract teachers. Studies looking into this question focus only on the larger salary costs and many of the associated social and incremental economic costs are ignored. However, while this fact should not be ignored, in some situations contract teachers receive a fraction of in-service training (and no pre-service training as they are plucked from a non-civil service pool) with the resultant economic training costs likely to be a small fraction of what they are for regular teachers. Having said that, in some countries such as Guinea contract teachers receive as much as 18 months of training. This compares, for instance, with Senegal and Mali where contract teachers are provided with 3 months of training. In India, on the other hand, while regular teachers are required to complete 2 years of initial teacher education, contract teachers are only required to undertake an 'induction' program of varying lengths prior to starting their teaching. Considering the pertinent differences in training and salaries across the private and state sector, any cost-effectiveness analysis would benefit from cross-sector comparisons. For example, in certain countries private sector teacher salaries are a fraction of those paid to regular government teachers. Private sector teacher salaries may also be lower than contract teacher salaries. Considering the suggestion that private schooling outcomes may be better than government schooling outcomes, it may well be the case that even though contract teachers may be more cost-effective in imparting learning than regular teachers, in fact, private school teachers may be the most cost-effective of them all.

Muralidharan and Sundararaman (2010), Atherton and Kingdon (2010) explicitly model the cost effectiveness of contract teachers in India, and Froelich and Michealowa (2007) do so for West Africa. While most of the other studies highlight the salary differences, they do not explicitly model the relative cost effectiveness (Duflo, Dupas and Kremer, 2009; De Laat and Vegas, 2003; Froelich et. al., 2007; Kingdon, 2010). Other studies, such as Fyfe (2007) offer information on the relative cost of contract and regular teachers but do not match these to achievement differentials. Such studies can be synthesised in a meta-analysis to formally model the cost-effectiveness of contract teachers, using information on the relative salaries and predicted achievement differences where available.

One of the officially stated rationales for hiring contract teachers is to alleviate teacher shortages and rapidly expand enrolments in primary and secondary schools. The third strand of the question deals with this, but is less developed than the first two parts. Studies such as Fyfe (2007) and Duthilleul (2007) discuss the impact of contract teachers on increasing enrolments, across West Africa and India. Govinda and Josephine (2004) also analyse this issue. However, addressing teacher shortage does not just cover the hiring of teachers, as teacher absenteeism is high in many countries and the time on teaching-task (when teacher is present in school) is low. An important facet of this question is then “do contract teachers have lower absence rates, or higher time-on-task than regular teachers?” a point which is dealt

with by Muralidharan and Sundararaman (2010) and Atherton and Kingdon (2010) for India, and Duflo, Dupas and Kremer (2009) for Kenya. Another facet of this particular query is whether students taught by contract teachers are better in terms of alternative outcomes such as in their participation, drop-out or school completion rates. If a shortage of teachers has implications which manifest for instance through higher drop outs or reduced participation of children, then addressing these shortages through the provision of contract teachers may help in alleviating these problems. Therefore, this question will also address the alternative way in which contract teachers may be able to solve the problems associated with teacher shortages for instance by examining studies that look at the rate at which students drop-out or complete their primary education under a contract versus a regular teacher.

1.4 Authors, funders, and other users of the review

It is expected that the review will be of substantial interest to policy makers in developing countries, as contract teacher schemes are widespread and of growing importance as countries aim to expand their education systems in a fiscally manageable way. The findings will add rigour to the decision whether or not to expand or curtail contract teacher schemes.

It is the aim of the authors to publish the review in a peer-reviewed journal, such as the Journal of Development Effectiveness. The final review will be presented to policy makers at DfID and national governance where available. It will be disseminated to the authors of the contributing studies, who will be consulted in the process of conducting the review - both to aid the study and also complete knowledge gaps where appropriate.

The review team would also like to include a 'policy implications' section preferably to the final document. This will be done because not only is the topic of this research of academic interest but also because the questions raised in this review have important policy implications. For example, there are likely to be interesting political economy questions arising from the potential juxtaposition of staff hired on a permanent basis by the Ministry of Education versus non-permanent staff. The controversies surrounding the hiring and management of different types of teachers are real issues for many developing countries and the implications of these (as they may arise from the review) will be discussed for policy guidance.

1.5 Milestones in the review process

Expected time frame of tasks to be completed:

15 October:

Protocol to be submitted to the EPPI Centre

3 December:

Protocol completed in light of reviewers comments, approved by DFID.

Beg Jan- mid Feb:

- 1) Complete the search (on databases/manual etc.)
- 2) Upload search results onto EPPI Reviewer
- 3) Apply search criteria on the basis of title and abstract information
- 4) Code selected studies and de-selected studies
- 5) Document the initial selection process
- 6) Retrieve included studies

Mid Feb - end March:

- 1) Apply inclusion/exclusion criteria, code included studies and excluded studies
- 2) Document included and excluded studies
- 3) Carry out evaluation/critical appraisal
- 4) Code study characteristics (e.g. Estimation method, publication type etc.) and code studies in relation to research questions
- 5) Extract information from each included study
- 6) Conduct remaining analysis

End March - end April:

- 1) Write review and submit to referees

May - end August:

- 1) Amend review in light of comments and submit final draft

CHAPTER TWO

2 Methods used in the review

This will include all the details necessary to allow replication of the methods.

2.1 User involvement

We aim to engage users in all aspects of the review from beginning to end. During and prior to the protocol stage users (such as policy leads from DFID) had the opportunity to assess and comment on the scope of the review. This included discussions on all elements including the conceptual framework, search strategy and draft inclusion and exclusion criteria. This allowed us to take into consideration DFID's expectations from the review; for example potentially using the review as evidence for informed policy development, identifying possible gaps in the literature and evidence base and to inform new questions that may arise from the analysis. Advisors were sent the draft protocol and suggested amendments implemented as appropriate. The findings of the draft report will be presented in an appropriate forum to generate feedback. In addition to this once the report has been updated in light of the feedback/comments we intend to publish these findings in a relevant journal.

2.2 Identifying and describing studies

2.2.1 Identification of potential studies: Search strategy and search criteria

2.2.3.1 Search Strategy

The majority of our search will take place online, using keyword searches on education and economics databases, such as JSTOR, ERIC, Google Scholar, ASSIA, amongst others. The search will be conducted in English, French, Spanish and local languages where possible.

In addition to the published literature, sites such as REPEC will be searched for Working Papers, the Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) and Index of Conference Proceedings (available via the British Library) will be searched for conference papers, and the Dissertation Abstracts database searched for PhD and Masters dissertations at accredited universities in the US and UK. This list is non-exhaustive, and more will be searched in an iterative procedure.

(i) Databases for published papers and reports

JSTOR - Social sciences

<http://www.jstor.org/>

EBSCO: International Bibliography of the Social Sciences (IBSS) - economics, politics, sociology, anthropology and Economics)

<http://www.csa.com>

EBSCO: Business and Economics Databases

<http://search.ebscohost.com>

SCIENCEDIRECT - All sciences and humanities

<http://www.sciencedirect.com>

WEB OF KNOWLEDGE - All sciences and humanities

<http://apps.isiknowledge.com>

ECONLIT

ERIC - Education Resources Information Center

<http://www.eric.ed.gov/>

ISI - WEB OF KNOWLEDGE

<http://apps.isiknowledge.com>

ASSIA - APPLIED SOCIAL SCIENCES INDEX AND ABSTRACTS

PSYCINFO

AFRICAN JOURNALS ONLINE

<http://ajol.info/index.php/index/browse/alpha/index>

ASIA JOURNALS ONLINE

<http://asiajol.info/index.php/index>

AUSTRALIAN EDUCATION INDEX

<http://www.acer.edu.au/library/aei>

DIALNET - Spanish resources

<http://dialnet.unirioja.es/>

LATIN AMERICAN JOURNALS ONLINE - Latin American and Caribbean

<http://www.lamjol.info>

(ii) Databases for working papers and reports

For scholarly working papers, and forthcoming papers and reports, we will search in the following databases:

SOCIAL SCIENCE RESERACH NETWORK (SSRN)

<http://papers.ssrn.com>

NBER WORKING PAPERS

Protocol

<http://www.nber.org/papers>

RESEARCH PAPERS IN ECONOMICS (REPEC)

<http://econpapers.repec.org>

CENTRE FOR INTERNATIONAL DEVELOPMENT OF HARVARD UNIVERSITY

<http://www.hks.harvard.edu/centers/cid/publications>

WORLD BANK - Working papers, reports

<http://publications.worldbank.org/ecommerce/>

IMF - Working papers, reports

<http://www.imf.org/external/pubind.htm>

UNDP - Research papers, reports

<http://www.twinside.org.sg>

UNESCO - Research papers, reports

<http://cms01.unesco.org/en/literacy/resources/papers-and-reports/>

ILO - Working papers and reports

<http://www.ilo.org/public/english/dialogue/sector/papers/index.htm>

CREATE - Consortium for Research on Educational Access, Transitions and Equity

<http://www.create-rpc.org/database>

(iii) Databases for Theses

For PhD Theses, we will search in the following databases (the sources are in addition to the ones listed above):

INDEX TO THESES - contains all theses submitted in Great Britain and Ireland universities.

<http://www.theses.com/>

SIGLE

<http://www.opengrey.eu/>

(iv) Google Scholar search

<http://scholar.google.co.uk/>

In addition to the databases listed above, we will search in Google Scholar, using the same search criteria.

(v) Manual search

In addition to database search we will conduct manual searches once we have exhausted the automatic search, to locate the grey literature not covered. We will follow the guidelines issued by JBI (2008) and CRD (2009), which include:

- Searching the references of the papers in the sample;
- Citation searches (Google Scholar will be used for these)

- Contacting the most published authors on this topic to query knowledge of other work in this area.

2.2.3.2 Search Criteria

We will search the sources mentioned earlier, using a number of keywords and synonyms. Initially we will search in Title, Abstract and the search terms given below.

Broadly speaking, the searches are being carried out for 3 main concepts

CONCEPT 1: TERMS FOR CONTRACT TEACHERS

contract teacher(s), contract teaching staff, contract educator(s), contract personnel, para teacher(s), para teaching staff, para educator(s), para education staff, para personnel, temporary teacher(s), temporary teaching staff, temporary educator(s), temporary education staff, temporary personnel, interim teacher(s), interim teaching staff, interim educator(s), interim education staff, interim personnel

(Please note that the when implementing the search phrase searches such as “contract teaching staff” or proximity searches such as contract AND “teaching staff” and contract within 3 words of “teaching staff” will be done).

CONCEPT 2: TERMS FOR LEARNING OUTCOMES

academic achievement(s), academic assessment(s), academic performance(s), academic progress, academic test(s), academic mark(s), academic result(s), achievement(s), assessment(s), attainment, classroom learning, classroom performance, classroom test(s), cognitive achievement(s), cognitive outcome(s), cognitive result(s), education, evaluation(s), exam result(s), educational performance(s), educational attainment, educational achievement(s), educational result(s), grade score(s), learning, learning outcome(s), learning result(s), mark(s), performance(s), progression, progress, retention, result(s), scholastic achievement(s), scholastic attainment, scholastic performance(s), score(s), test(s), test result(s), test score(s)

(Please note that the search terms above can be pre-fixed with student/pupil/child in the free-text if required. Once again a combination of free text, phrase and proximity searches will be carried out).

CONCEPT 3: COUNTRIES

Bangladesh*, Benin*, Bhutan*, Burkina Faso, Burund*, Cambodia*, Cameroon*, Cape Verde, "Central African Republic", Chad, Comoros, Congo*, "Côte d'Ivoire", "Ivory Coast", Eritrea*, Ethiopia*, Gambia*, Ghana*, "Guinea-Bissau", Haiti*, India*, Indonesia*, Kenya*, Kiribat, Korea*, Kyrgyz*, Lao*, Lesotho, Liberia, Madagascar, Malawi*, Mali*, "Marshall Islands", Mauritania*, Micronesia, Mozambique, Nepal*, Nicaragua*, Niger, Nigeria*, Myanmar, Pakistan*, Papua New Guinea, Philippin*, Rwanda*, Samoa, "São Tomé and Príncipe", Senegal*, Sierra Leon*, Solomon Islands, Somalia*, Sudan*, Swaziland, Syria*, Tajik*, Tanzania*, "Timor-Leste", Togo*, Tonga, Turkmenistan*, Tuvalu*, Uganda*, Uzbek*, Vanuatu*,

Protocol

Vietnam*, Yemen*, Zambia* , Zimbabwe*, "less developed country(ies)", "least developed countr(yies)", "developing country(ies)", "lower middle income country(ies)", "low income country(ies)" , "lower income country(ies)", "low(er) middle income nation(s)", "low(er) income nation(s)"

(Please note that* indicates truncation, therefore Bangladesh* will find Bangladesh AND Bangladeshi and so on).

The above list is intended to be indicative and is therefore non-exhaustive and will be refined prior to implementation.

For quality assurance purposes the searches will be conducted independently by a Research Assistant. She will compile the search results and upload them to EPPI Reviewer. They will be checked for duplication. Summary of actions taken will be provided for each stage of the search process.

Strategy for the search

As far as possible, the searches will follow the following strategy (this may vary depending on the available interfaces).

Terms for contract teachers in the title

Terms for contract teachers in the abstract

Controlled terms for contract teachers

Search 1 OR 2 OR 3

Terms for learning outcomes in the title

Terms for learning outcomes in the abstract

Controlled terms for learning outcomes

Search 5 OR 6 OR 7

Search 4 AND 8 i.e. (Search 1 OR 2 OR 3) AND (Search 5 OR 6 OR 7)

If the above search strategy above yields too many results, then by using the same steps, the search strategy will also include the country terms.

If the search strategy that combines concepts as in point 9 (above), yields narrow or few results, then a search will be run for concept 1 only and the search results will be imported into EPPI reviewer. Screening for Concept 2 and 3 will be carried out at the 'applying inclusion and exclusion criteria' stage.

Example of an ERIC Search

Below is an example search for concept 1 (i.e. contract teachers). This search yielded 152 results. Below is the search string used in the advanced search forms of the ERIC database. A 'keyword' search was run, which locates the search terms in both the Title and Abstract.

(KW:"contract teacher" OR KW: "contract teachers" OR KW:"contract teaching staff" OR KW:"contract educator" OR KW:"contract educators" OR KW: "contract personnel" OR KW:"para teacher" OR KW:"para teachers" OR KW:"para teaching

staff" OR KW:"para educator" OR KW:"para educators" OR KW:"para education staff" OR KW:"para personnel" OR KW:"paraeducator" OR KW:"paraeducators") OR (((KW:contract AND KW:"teaching staff") OR (KW:contracted AND KW:"teaching staff") OR (KW:para AND KW:"teaching staff")) OR (KW:"temporary teacher" OR KW:"temporary teachers" OR KW:"temporary teaching staff" OR KW:"temporary educator" OR KW:"temporary educators" OR KW:"temporary education staff" OR KW:"temporary personnel" OR KW:"interim teacher" OR KW:"interim teachers" OR KW:"interim educators" OR KW:"interim educator" OR KW:"interim teaching staff" OR KW:"interim education staff") OR ((KW::temporary AND KW:"teaching staff") OR (KW:temporary AND KW:"education staff") OR (KW:interim AND KW:"teaching staff") OR (KW:interim AND KW:"teaching staff")) Publication Date: 2000-2012

(Please note that this example is from a search that has been run on the free-ERIC database version. This interface does not allow for proximity searches such as contract within 3 words of teaching staff, therefore phrase searches and proximity searches using brackets and Boolean operators have been shown here as an example)

2.2.2 Screening studies: Applying inclusion and exclusion criteria

Defining relevant studies: Inclusion criteria

The review will focus only on studies from developing countries, and only on schemes which hire contract teachers as formal teachers, not as teaching aides or classroom assistants. To evaluate the relative effectiveness of differing types of teachers, they must perform the same roles. Essentially this will mean comparing only contract and regular teachers within the state sector, excluding those who teach in private schools. However, if there are any studies that compare contract teachers in the government sector with teachers in the private sector, they will also be included. Studies which generally compare regular government and private school teachers will not be included as the question specifically relates to the effectiveness of contract teachers. We will include both published and unpublished studies from both the academic and policy world, including the “grey” literature (conference proceedings, non-peer reviewed journals). Only studies since the EFA Conference in Dakar 2000 will be considered. Specific inclusion criteria are defined in Section 2.2

Defining relevant studies: Exclusion criteria

The review will not look at high income countries or transition economies. It will also not consider middle-income countries where less than 20% of the country lives on under \$1.25/day. Secondary school children or older will not be considered. Volunteer teachers and class-room assistants will be excluded as will outcomes such as non-cognitive scores, measures of wellbeing and outcomes such as self-reported happiness. Any studies prior to the EFA Conference in Dakar (2000) will not be considered.

Protocol

Once the studies have been identified they will be uploaded to EPPI reviewer, and the studies screened for their relevance to the systematic review. We will use the following relevance criteria based on both title and abstract.

(1) Does the study analyse a contract teacher scheme?

(2) Does the study focus on a low or middle income country?

If a study scores “Yes” for both relevance criteria it will be brought forward to the inclusion/exclusion stage.

2.2.3 Inclusion/Exclusion criteria

We will define our inclusion criteria using the “PICOS” method (Population, Intervention, Comparison and Outcomes, and study design), to which we add time. These inclusion and exclusion criteria will be applied to title, abstract and full text. This framework requires screening of results with respect to population, intervention, comparison, outcome and time. In relation to our research question the PICOST framework will be as follows:

Table 1: PICOST inclusion/exclusion criteria for defining studies (quantitative and qualitative)		
	Included	Excluded
Population	Lesser-developed countries Middle-income countries where more than 20% of population live on under \$1.25 per day. Primary school children	High-income countries Transition economies Middle-income countries where less than 20% of countries live on under \$1.25 per day Secondary school children and older
Intervention	Teachers who have same responsibilities as regular teachers. Contract teachers in government schools	Classroom assistants, Volunteer teachers.
Comparison	Regular civil service teachers in government schools	Classroom assistants, volunteer teachers
Outcome	Academic achievement tests Completion or progression rates.	Self-reported happiness, measures of well-being. Non-cognitive scores
Time	Since EFA conference in Dakar (2000)	Prior to EFA conference in Dakar (2000)

Excluded studies will have failed to satisfy at least one inclusion criteria or will have met at least one of the exclusion criteria. Studies that fail to meet inclusion criteria will be coded as failing to meet inclusion criteria and will be coded such that it can be reported how many inclusion criteria each study failed to meet and what these criteria were. Excluded studies will also be coded similarly.

2.2.4 Characterizing included studies (if EPPI-Centre review: EPPI-Centre and review-specific keywording)

The studies remaining after application of the criteria will be key worded /coded. All the keyworded studies will be added to the larger EPPI-Centre database, REEL, for others to access via the website.

Coding of included studies will be done as follows:

1) REGION

Specify broad geographic region (South Asia, Latin America etc.)

2) COUNTRY

Specify which country, specify if it is a DFID priority country, specify if fragile state

3) SETTING

Rural/semi-rural/urban

4) WHAT IS THE COMPARISON?

Regular government teacher versus government contract teacher, regular government teacher versus contract private teacher

5) WHAT OUTCOME DOES STUDY CONSIDER?

Learning (test scores), completion rates, drop-out rates etc.

6) SAMPLE SIZE

Number of cases considered in study

7) CONFOUNDING FACTORS

Does the study convincingly account for confounding factors in the analysis for example using econometric techniques, randomisation etc.

8) DATA COLLECTION METHOD

For example secondary sources or primary data collected

9) BLINDING IN ANALYSIS (FOR STUDIES WITH COMPARISON GROUPS ONLY)

Yes, No

10) APPROPRIATENESS OF DATA ANALYSIS METHOD

Appropriate/Inappropriate

11) STUDY DESIGN

11.1 QUANTITATIVE/QUALITATIVE

Protocol

11.2 QUANTITATIVE - what type of study is it? RCT, OLS etc.

11.3 QUALITATIVE - case study, focus group, ethnographic research etc.

12) TIME SCALE OF STUDY

Which year was study conducted in?

13) LANGUAGE

What language was study conducted in?

2.3 In-depth review

2.3.1 Identifying and describing studies: Quality assurance process

Once the review studies have been identified, pairs of RG members will work independently and then compare their decisions and come to a consensus. Any disagreements that arise among the reviewers will be resolved through discussion or with input from the third PI. Data extraction will also be done in a similar manner.

Studies identified as meeting the inclusion criteria, will be analyzed in depth, using the EPPI-Centre's detailed data-extraction software, EPPI-Reviewer.

Even if a study has met the initial inclusion criteria for the review, it may not meet the quality standards for the review. Therefore, a quality and relevance assessment must be carried out. We will be drawing heavily on EPPI-Centre methods and guidelines and will adapt the tools for this review. This will include using three dimensions of critical appraisal, as follows:

1. Assess the methodological quality of the study;
2. Assess the relevance/appropriateness of the research design for answering the review question;
3. Assess the relevance of the focus of the study in answering the review question.

These will provide an overall Weight of Evidence (WoE) as provided by the study to answering the proposed review question.

After the application of the inclusion/exclusion criteria, remaining studies will be carried forward to the validation, reliability and applicability stage. For example we will use the following hierarchy of evidence to evaluate the validity of the studies.

- (i) Systematic review of randomised controlled trials (RCTs)
- (ii) An Individual RCT
 - (a) Which evaluates contract teacher effect alone
 - (b) Which evaluates contract teacher effect in conjunction with changes in class-size/multi-grade
- (iii) Systematic review of cohort studies
- (iv) Individual cohort study
 - (a) Using techniques to control for endogeneity of contract teacher effect
 - (b) Comparison of means

Contract teachers are often appointed to schools with fewer resources in more remote areas and often serve more disadvantaged children, so any valid estimate of the contract teacher effect must take account of the wider social and economic context in which these contract teachers are employed and also the potential non-random matching of contract teachers to particular children/schools on the basis of unobserved characteristics of both the teachers and the students. For example, contract teachers may be systematically assigned to less able children within a school. Finding that contract teachers are not as 'effective' as regular teachers in imparting learning for instance, may therefore be largely due to the low-ability profile of the students they teach rather than a pure contract teacher effect. It may also be that contract teachers are systematically different in their unobserved characteristics from regular teachers. It is therefore very important to control for the observed and unobserved student, school and teacher characteristics in a study that aims to estimate true contract teacher effects. Studies which rank "iv(b)" and below on the hierarchy of evidence will not take this into account as effectively, and will be excluded from our review. This is because studies ranking above "iv (b)" are able to 'control' for the wider social and economic context and provide generalizability more accurately. For example, a study such as (ii) based on an RCT can exploit the random allocation of teachers to estimate the pure effect of hiring an additional contract teacher as opposed to a regular teacher.

The validity of qualitative studies will also be analysed by choosing those that give relevance to the wider context in which the effectiveness of contract teachers can be judged. This will be based on factors such as the extent to which the study employs a methodology that minimises the risk of bias.

In relation to reliability the studies will be judged on extent to which the findings of the study are reproducible while the applicability of the studies will be judged on the extent to which their findings can be applied to low and middle income countries.

Studies which are excluded based on not meeting the reliability, validity and applicability criteria will be coded as such.

Protocol

Because we anticipate coming across different types of study design, the assessment of quality of these studies will follow a rigorous process. All studies, irrespective of design will be judged according to the following standards. Those studies that meet all of the following criteria will be considered 'good quality'; those meeting a majority of the criteria will be considered 'medium quality' while those that don't meet most of the following will be considered 'poor quality' and will be excluded from the in-depth review.

1. **Completeness of reporting:** this will entail assessing transparency, reporting bias and publication bias. We expect a good quality study to have a description of the intervention (i.e. the presence of the contract teacher) and the participants (children), clear account of methods of data collection and analysis and consideration of confounding factors along with complete reporting in relation to measured results. A study will be considered of poor quality if it fails to meet one or more of these requirements.
2. **Feasibility of assumptions:** If the reviewers remain unconvinced about the assumptions made within the study on which the conclusions are based, the study would be classified as of low or medium quality.
3. **Appropriateness of methodology:** Methodology will be analyzed to ensure trustworthiness, reliability and validity. Assessment of the appropriateness of the methodology depends on whether a study is quantitative or qualitative in nature. These will be assessed according to the approaches discussed below.
4. **Consideration of confounding factors:** these will include (when necessary) assessing sampling bias, attrition bias, detection bias, endogeneity bias, ability to address heterogeneity effectively and so on. Confounding factors can be controlled for at the sampling stage or at the analysis stage. If studies take no consideration of confounding factors at either stage, they will be considered of poor quality and will be excluded from the in-depth review. Studies that control for confounding factors at any one stage will be considered of medium quality and will be included in the in-depth review. Studies controlling for these factors at both stages will be considered of high quality and will be used for in-depth review.
5. **Comprehensive reporting of findings:** Are the studies finding apparent and comprehensively reported? For example, if the study initially aimed to measure certain outcomes and did not report on all of the outcomes, it will be judged of poor quality and will be excluded.

Evaluating the quality of methodology of quantitative studies (see point 3 above):

We will use the following critical appraisal approach to evaluating the methodology of quantitative studies:

(i) How was the intervention (the contract teacher) assigned? I.e. was assignment random or non-random? If random, the study will be judged of high quality, if non-random or medium or poor depending on how the intervention was further assigned.

(a) If randomized, is the counter-factual clearly stated?

(1) Contract vs Regular teachers?

(2) Contract vs No teacher?

(3) Contract vs. private school teacher?

Yes/No/Partly, if yes clearly stated, the study will be considered of high quality, partly will be medium and when it is not clearly stated the study will be considered of poor quality.

(b) If non-random, is selection bias a threat to internal validity? Yes or No. If selection bias threatens internal validity, then:

(i) Is the selection explicitly modeled or controlled for? If not, the study will be considered of poor quality and excluded from the in-depth review.

(ii) What question is being asked in the study? Do they evaluate the 'as is' effect of contract teachers, or do they evaluate a conditional effect? A study that controls for the 'as is' effect will be considered medium quality while one controlling for the conditional effects will be considered of high quality. Both will be included in the in-depth review.

(iii) Is the contract teacher effect homogenous across different student-types? Studies that consider the contract teacher affect across different student types will be considered high quality, those that do not will be considered medium quality and both will be included in the final review.

(iv) Is the cohort representative of the population? If not, does the sample have any characteristics which may affect the external validity of results? If so, the study will be considered of poor quality and will be excluded from the in-depth review.

Evaluating the quality of methodology of qualitative studies (see point 3 above):

1) Is the epistemological approach clearly stated? Yes/No/partly - studies where it is clearly stated are of high quality, partly stated are of medium quality and where it is not stated at all are of poor quality.

2) Was sampling appropriate? Yes/No/partly? Studies where it was appropriate will be considered of high quality, partly stated are of medium quality and where it is not stated at all are of poor quality.

3) Was data collection appropriate/repeatable and trustworthy? Yes/No/partly - studies where it was appropriate/trustworthy will be considered of high quality, partly stated are of medium quality and where it is not stated at all are of poor quality.

4) Was the approach to data analysis appropriate/repeatable and trustworthy? Yes/No/partly - studies where it was appropriate/trustworthy will be considered of high quality, partly stated are of medium quality and where it is not stated at all are of poor quality.

Judgments relating to whether and to what extent the above criteria are met (to classify studies as high, medium or low quality) will be done independently by the

two reviewers. In case of difference in opinion, the third expert will be called upon and a mutual decision arrived at.

Studies will be coded on the basis of above stated quality criteria to arrive at the WoE.

2.3.1 Synthesis of evidence from included studies

Once we have identified and assessed our studies, we will collate the research using methods such as meta-analysis and systematic empirical narrative to identify the effects proposed in our questions. The synthesis will be presented in the form of a structured narrative, summary tables and meta-analysis. This synthesis will then be used to formulate conclusions and recommendations. When quantitative research studies address similar research questions, a statistical meta-analysis will be used to combine the numerical results and if possible provide an effect size in relation to our research question. In particular, if possible, we will be aiming to provide an effect size for the contract teacher effect. More extensive sub-group analysis (for example rural versus urban or private versus government etc.) will be conducted if possible. Where the results of empirical research are in a narrative form, these will be synthesized using narrative empirical synthesis in order to collate results from different types of empirical research including evaluative research, survey research etc.

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