

Helpdesk Report: Impact of teacher training on students' learning outcomes

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Query: What is the impact of teacher training on students' learning outcomes?

Content

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1. Overview

While there is extensive literature on teacher quality, teacher education and training, most of it focuses on emphasising the extent of the problem, their importance, how they might be developed or delivered. A few others mention programmes that have been conducted in various countries. There is very little literature that focuses specifically on the impacts of teacher training on student's learning outcomes that are measurable.

Most of the studies that have looked at impacts of teacher training (e.g. Hanushek) are on developed countries and many not be relevant as the conditions in SSA are so different.

In terms of impact evaluations, teacher quality has been examined either through measurable teacher characteristics or through a 'fixed teacher effect'. The literature seems to be mixed in terms of whether it has impact on student achievement, though the dominant view seems to be that measurable teacher characteristics such as academic achievement, professional achievement and training do not seem to have any effect on student achievement.

A literature review carried out under the ILOPS programme (ActionAid, 2010) found no clear evidence of the impact different types of teachers have on student learning outcomes. It concluded that there is a distinct lack of robust evaluation or empirical evidence. Anecdotal evidence portrays the role of increasingly using non-professional teachers to fill the gaps as a promising policy option yet warns of the potential negative impact on quality. Much of the literature supports the notion that purposeful parental involvement can have a positive influence on students' learning (ActionAid, 2008).

A study from the Global Poverty Research Group, looking at student performance in India, finds that pre-service teacher training and having a Masters' level qualification together raise student achievement by a small, but significant, amount (Kingdon, 2006). Other studies also show that teachers' subject knowledge increases students' test scores (Lee et al, 2005; Spreen and Fancsali, 2005).

A few studies show that girls' achievement is higher when they have a female teacher (Aslam and Kingdon, 2008). The TEGINT project in particular, finds that better trained teachers (pre-service training) are associated with girls speaking out more about obstacles to completing their education (e.g. early marriage and pregnancy) and possible solutions.

2. Teacher training and learning outcomes

The Role of Teachers in Improving Learning in Burundi, Malawi, Senegal and Uganda: Great Expectations, Little Support

The Improving Learning Outcomes in Primary Schools (ILOPS) Project: Research Report on Teacher Quality, ActionAid, 2010, by Akankshay

www.actionaid.org/sites/files/actionaid/ilops_teachers_final.pdf

Understanding what is happening with teachers' availability, training and quality is one of the most pressing issues facing education in Africa today. Over the past decade many African countries have been reducing their investments in teacher training and recruiting non-professional teachers both as a cost-cutting measure and as a quick-fix solution to the teacher shortage. The full impact of this trend is only now being felt as the teaching profession fragments and learning outcomes deteriorate.

A good quality teacher can guide the learning process of children, making learning relevant and stimulating. S/he can impart knowledge and skills that will help children to secure their educational rights, improve their health and self-esteem, and gain fair employment. A teacher can also be a role model by embracing the principles of social justice and treating all students equally without discrimination, while encouraging each student's unique strengths. Indeed, a dedicated and well-trained teacher can provide children with the essential skills to critically analyse, challenge and improve the discriminatory attitudes or behaviour that may be present in their homes, schools and communities.

While it is generally agreed that that teachers can shape learning and young lives, there remains considerable debate as to the national and local-level policies and programmes that best support teachers. Topics of debate include the level of schooling teachers should have themselves, what length of training they need and what professional development and support they should be able to draw on in order to fulfil these ambitious roles. Each strand of the policy and practice spectrum is complicated, interdependent and determined by contextual factors. In many African countries constrained education budgets coupled with the inconsistent and uncoordinated involvement of various actors in supporting teachers further complicate appropriate policy responses.

An alarming trend concerns the low levels of student achievement. Though there is little existing research that directly correlates students' achievement outcomes with teachers' training, qualification and contract variations, the fact that teachers are the main staff responsible for supporting pupils' learning makes a connection between these two factors highly likely. The Education for All Global Monitoring Report (EFA GMR) finds that, 'what students achieve in school is heavily influenced by classroom practices and teacher' skills... One of the most important requirements for sustained progress towards better quality in education is an improved learning environment, encompassing the physical school infrastructure, the learning process and the interaction between children and teachers' (UNESCO GMR, 2010: 114–15).

This study compiled evidence on issues impacting on the teaching profession, including recent trends in the recruitment of teachers, their pay levels and training. The study also

tabulated how teachers and parents interacted both within school governance structures and through various other activities to support children's learning.

A literature review was carried out exploring the link between teacher profiles and student achievement. This light-touch review found no clear evidence of the impact different types of teachers have on student learning outcomes. There is a distinct lack of robust evaluation or empirical evidence. Anecdotal evidence portrays the role of non-professional teachers as a promising policy option and warns of the potential negative impact on quality. These mixed and, at times, contradictory perspectives on the impact different teachers have on achievement can partly be explained by differences and limitations in methodology and which type of 'link' is being assessed. It is possible that separating out this impact is so difficult due to the multiple factors affecting teachers' performance, competency and students' learning.

The literature review shows that most studies do not evaluate the relationship between pedagogical knowledge, teachers' behaviour and student learning, but focus on shifts in teaching attitude, rather than on changes in knowledge and skills (Wilson, 2002). Research also does not link the profile (e.g. how they differ by training levels and academic qualification) of teachers with student outcomes. However, Van de Grift (2007) argues against using student test scores as a sole measurement of teacher quality and advocates rather for the use of observation tools to monitor and assess this instead.

Other papers from the ILOPS study: <http://www.actionaid.org/tags/429/351>

Teacher quality and parental participation: An exploratory review of research and resources related to influencing student outcomes

Karen Edge, Sharon Tao, Kathryn Riley and Khatera Khamisi, ILOPS Literature Review commissioned by ActionAid, 2008

http://ioe.academia.edu/SharonTao/Papers/475739/Teacher_quality_and_parental_participati_on_An_exploratory_review_of_research_and_resources_related_to_influencing_student_outcomes

This literature review collapses the student outcome literature into teacher quality and parental participation to reflect the fact that, for the most part, improvements in teacher quality or parental participation are designed to improve students' learning.

Teacher quality

Teacher training alone or in combination with other strategies is the most common approach to improving teacher quality in the developing world (Chapman, 2000). However, an ongoing policy challenge is the lack of data on the impact and effectiveness of different training and development models. Based on research included within the review, in order for initial teacher training and ongoing continuing professional development to be effective it must be relevant, timely and context-specific.

Teachers' motivation is both a contextually and culturally specific factor influencing teacher quality. It interacts with other variables to determine quality related outcomes for teachers, such as work conditions, relationships, expectations and behaviour. A number of studies have focused on the range of incentives that can be introduced to improve teachers' motivation, enhance the quality of teachers and, hopefully, raise students' performance.

A number of studies explore the relationship between teachers' practices and students' learning. However, the results of these studies are mixed. According to US educator, Linda Darling-Hammond (2002), the variables presumed to be indicative of teachers' competence and which are linked to students' learning include academic ability, years of education, years of teaching experience, measures of subject matter and teaching knowledge, certification status and teaching behaviours in the classroom. However, each study has different views on what the qualities of a good teacher are and how these could be measured.

Parental participation and student outcomes

This review demonstrates that much of the literature supports the notion that purposeful parental involvement can have a positive influence on students' learning. Parental participation in children's learning is positively related to their intellectual, affective and social development (Jeynes, 2005). Fan and Chen (2001) found that high parental expectation for children's educational achievement was the strongest factor relationship in students' academic achievement. Similarly, Dearing et al. (2006) found that increased levels of parental involvement in school, including attending meetings, conferences and events predicted improved child literacy. When parents are involved in their children's learning, students report increased effort, concentration, attention, interest in and responsibility for learning, and higher perceived competence (Gonzalez-DeHass et al., 2005). In some cases, parental participation is also associated with improved behaviour and higher school completion rates.

Impact of teachers' professional development on school improvement-an analysis at Bangladesh standpoint

Hoque Kazi Enamul; Alam Gazi Mahabubul; Abdullah Abdul Ghani Kanesean, *Asia Pacific Education Review*, Volume 12, Issue 3, Pages 337-348
www.springerlink.com/content/1144017627k002vm/

This study seeks to describe the teachers' professional development activities in Bangladesh and explores the hypotheses about the relationship between teachers' traditional professional development activities and school improvement. Data from a representative sample of 127 City secondary schools from Bangladesh were gathered through questionnaires from 127 principals and 694 teachers. Hierarchical multiple regression analysis was used in this research. This study found significant impacts of some of teachers' professional development activities on school improvement. It also found that the maximum school improvement can be achieved if schools put more emphasis on teachers' collaboration, in-service training and classroom observation and less emphasis on individual action enquiry. The findings of this study provide important information for policymakers, educational managers and especially for the headmasters and teachers concerned with the improvement of teachers' quality in secondary schools of Bangladesh. This study adopts a concurrent approach of data collection and analysis.

The Effectiveness of Inputs in Primary Education: Insights from Recent Student Surveys for Sub-Saharan Africa

Sebastian Fehrer, Katharina Michaelowa, and Annika Wechtler
Journal of Development Studies, Vol. 45, No. 9, 1545–1578, October 2009

This paper jointly analyses data from the two large databases – PASEC and SACMEQ, to look at the impact of educational inputs on student achievement in 21 sub-Saharan countries. The Programme d'Analyse des Systemes Educatifs de la CONFEMEN (PASEC), Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), and the UNESCO/UNICEF Monitoring Learning Achievement (MLA) are the three large evaluation programmes that cover almost all countries in sub-Saharan Africa between them. PASEC (in francophone Africa) and SACMEQ (in Anglophone Africa) data are comparable except for their focus on different grades. While PASEC has data on second and fifth grades, SACMEQ has data on sixth grades.

In terms of education inputs the study focuses on school equipment, teacher quality and class organisation. Teacher quality includes teacher education, knowledge and in-service training. The study's most striking finding was that teacher academic qualification and professional training have **no** correlation with academic achievement for the PASEC data. In SACMEQ however, teachers' academic qualification were significant and professional qualification was significantly correlated in all except in one regression. However these

indicators capture only duration of education and not quality. The correlation between teacher's professional training and their subject matter knowledge is also not very strong in PASEC and SACMEQ countries. In-service training is negatively significant in SACMEQ countries as well as in some individual francophone countries (PASEC). In PASEC regressions, where the in-service training refers to number of courses attended per year, there is a positive correlation where the scores of fifth graders improve with each additional year of teacher's training.

What can Teachers do to Raise Pupil Achievement?

Monazza Aslam and Geeta Kingdon, RECOUP Working Paper 19, 2008

<http://recoup.educ.cam.ac.uk/publications/WP19-Whatcanteachersdofinal.pdf>

This paper uses school-based data, collected in 2002-2003 from government and private schools from one district in Punjab province in Pakistan, to examine whether teacher characteristics and teaching practices affect student achievement. It therefore looks at teacher qualifications, experience, training, etc, as well as uses information from subject teachers pertaining to their teaching practices and these, often unobserved, 'process' variables are included in estimates. Findings show that the standard characteristics such as qualifications, experience and training do not significantly matter to pupil achievement. However, teachers are paid higher if they have these characteristics. Findings also show that teaching 'process' variables are the ones that improve student achievement significantly. The study also found that girls' achievement is higher when they have a female teacher.

Teacher characteristics and student performance in India: A pupil fixed effects approach

Geeta Gandhi Kingdon, Global Poverty Research Group Working Paper 59, 2006

<http://economics.ouls.ox.ac.uk/14026/1/gprg-wps-059.pdf>

This paper looks at whether a higher teacher certification and higher pay improves student performance in India. It finds that pre-service teacher training and having a Master's level qualification together raise student achievement by about one fifth of a standard deviation – thus a small, but a statistically significant, effect.

Changing pedagogical practice in Kenyan primary schools: the impact of school-based training

Frank Hardman, Jan Abd-Kadir, Catherine Agg, James Migwi, Jacinta Ndambuku and Fay Smith, *Comparative Education*, Vol 45 (1), pages 65-86, February 2009

This study reports on the impact of The Strengthening Primary Education (SPRED) project funded by DFID - on learning and teaching. This was a national, school-based teacher development programme in Kenyan primary schools. SPRED I focused on textbook supplies and teacher professional development programmes; SPRED II focused on broad education reform and SPRED III on direct budgetary support. Textbooks, headteacher training and school based in-service training were supported through all three phases. The school based teacher development (SbTD) programme was a key aspect of the project.

The data is drawn from the national baseline study (n=102), 144 video-recorded lessons, covering the teaching of English, maths and science at Standards 3 and 6, interviews with school management committees, head teachers, teachers and students.

The study found that compared to the earlier baseline, teachers were more interactive with the pupils in their wholeclass teaching and greater use was being made of group work. Lesson plans, teaching resources and flexible classroom layouts were also seen more. However, the greatest impact on classroom practice was seen in the classrooms of those teachers who had undergone the most systematic in-service training under the SbTD.

School effectiveness in 14 sub-Saharan African countries: links with 6th graders' reading achievement

Valerie E. Lee, Tia Linda Zuze and Kenneth N. Ross, *Studies in Educational Evaluation*, 31 (2005) 207-246

This paper looks at the different factors that are associated with educational effectiveness in 14 sub-Saharan African countries. Students' literacy achievement at the end of Grade 6 is used as an indicator for educational effectiveness while taking into account their socio-economic background. The data is drawn from the SACMEQ II project. The study grouped the various factors that were associated with school effectiveness into three groups: school composition (i.e. social background of students), school context (grade cohort size), and physical and human resources (libraries, offices, playground, etc; and high-quality teachers). Amongst other findings, a key finding of the study was that there was a strong association between high-quality teachers and student outcomes. Teacher quality measure was a composite of teachers' years of education, courses in pedagogy, and experience, as well as teachers' scores on the same literacy test administered to students. This was then aggregated to the school level and converted to a z-score.

What can we learn about improving teaching and learning from comparing policies across countries? A study of student achievement and teacher quality in Southern Africa

Carol Anne Spreen and Cheri Fancsali

Paper from the 2005 International Invitational Educational Policy Research Conference

www.sacmeq.org/downloads/05conf/spreen.zip

This paper looks at the association between student achievement and teacher quality using SACMEQ II data on five countries – South Africa, Botswana, Mozambique, Tanzania and Namibia. It looks at three types of data: individual student and family characteristics, teacher characteristics and practices, and school/classroom resources. Teacher-level variables include measures of teacher preparation, content knowledge, support and pedagogical approach. These include number of years of professional training, number of days of in-service training, teachers' assessment of the effectiveness of the in-service training, and reading and mathematics test scores. Student achievement was measured by the sixth-grade math and reading achievement tests.

The results were mixed. Years of professional training in teachers showed a positive relationship to math achievement amongst students in Mozambique and South Africa, and reading in Namibia and South Africa. It showed a negative relationship to math achievement in Botswana and Tanzania. Teacher content knowledge, however, was a statistically significant predictor for math achievement of students in four countries (except Mozambique).

The paper argues that teacher quality and effectiveness cannot be judged or measured by years of education and hours of professional development.

Non-graduate teacher recruitment and retention: some factors affecting teacher effectiveness in Tanzania,

Towse, P., Kent, D., Osaki, F. And Kirua, N. (2002), *Teaching and Teacher Education*, Vol. 18, pp. 637-652

Since students generally perform better if taught by well qualified, trained and motivated teachers, recruiting better qualified young people is a prerequisite to improving the quality of educational provision. Ongoing economic reforms in Tanzania have left teaching as one of the few salaried careers open to secondary and tertiary leavers. This study considered the rationale of non-graduate students for choosing teaching as a career, perceptions of the job and future aspirations. Findings, which will inform the Sector Development Programme, indicate that although many initially regarded teaching as a 'last resort', low-status, low-paid

job, the majority intended to become classroom teachers. Questions remain, however, as to their motivation, commitment and overall effectiveness.

3. Focus on the impact on girls

TEGINT Report: Transforming Education for Girls in Nigeria and Tanzania a cross-country analysis of baseline research

Elaine Unterhalter and Jo Heslop, Institute of Education, University of London, September 2011

www.actionaid.org/sites/files/actionaid/tegint_-_a_cross_country_analysis_of_baseline_research_from_nigeria_and_tanzania.pdf

This is a report on the project Transforming Education for Girls in Nigeria and Tanzania (TEGINT) between 2007 and 2009, which looked at key aspects of gender and education, such as enrolment, attendance, progression, school processes and socio-economic factors that affect them. It also records girls' views on obstacles to education and how they can be overcome. One of the areas considered by the study was – how teacher's qualifications were associated with girls' progression and attainment. The study found that better trained teachers (pre-service training) were associated with girls speaking out more about obstacles to completing their education (e.g. early marriage and pregnancy) and possible solutions. The study however, does not interpret a causal relationship in this case. While it could be true that a better educated and trained teacher is able to make girls more aware and vocal about their rights, this could also be due to parental influence, or family background which influences school choice (i.e. attending schools where teachers are better qualified).

Higher proportions of female teachers and lower pupil-teacher ratios were associated with reduced gender parity in enrolment, attendance, progression and attainment in the project schools in Tanzania, but not in Nigeria.

Make it Right: Ending the Crisis in Girls' Education

A report by the Global Campaign for Education and RESULTS Educational Fund

www.campaignforeducation.org/docs/reports/makeitright/MakeltRight_Report_07.pdf

Chapter 6 of this report focuses on the acceptability of education – in particular valuing women teachers and engendering pedagogy.

The presence of a female teacher can help girls and parents feel more confident in sending their daughters to school. In addition to protecting girls from potential abuse, having female teachers provides girls with role models (Herz and Sperling 2004). Increasing the number of female teachers also has the potential to increase enrolment (Nilsson 2003), with this correlation especially strong in sub-Saharan Africa (UNESCO 2006). Well-trained, motivated, female teachers are a key factor in ensuring gender equality, especially at the secondary level as they serve as effective role models for girls (and, importantly, for their families) and therefore promote their sustained participation (VSO 2011).

In some parts of the world, notably Latin America, North America and Europe, women teachers pre-dominate, especially in pre-primary and primary education. One reason for this phenomenon is that taking care of younger children is traditionally seen as an extension of motherhood and therefore a 'natural' job for women. As research shows, the more feminised an occupation is, the more likely it is that its employees will be paid poorly (Drudy, 2008).

Poor quality education disproportionately affects girls, who will struggle to leave school with the cognitive and non-cognitive skills to live healthy, productive lives. The global learning

crisis is magnified for girls in low-income countries, with many leaving school even after four or five years unable to read a simple sentence

Teacher training in gender-sensitive teaching practice can help to ensure that teachers employ techniques to ensure equal interactive time with boys and girls, encourage female students' participation in class, address gender discrimination among students and nurture a safe and positive learning environment for girls as well as boys.

4. Literature from developed countries

Increasing the Odds: How Good Policies Can Yield Better Teachers

National Council on Teacher Quality

www.nctq.org/nctq/images/nctq_io.pdf

This booklet summarises briefly what the research says about the attributes of an effective teacher, including: Master's degrees, experience, education courses, traditional certification, teacher's race, subject area knowledge, teacher's level of literacy, selectivity of college and soft attributes.

Teacher Quality

Eric Hanushek and Steven G. Rivkin in Eric A. Hanushek and Finis Welch (ed.), *Handbook of the Economics of Education*. Amsterdam: Elsevier, pp. 1051-1078.

http://edpro.stanford.edu/hanushek/files_det.asp?FileId=188

This chapter refers mostly to US systems but policy relevant inferences (particularly section 6) could be applicable worldwide. The paper is a broad overview on what constitutes teacher quality and the difficulties in measuring it as well as in 'legislating' it.

Does Teacher Training Affect Pupil Learning? Evidence from Matched Comparisons in Jerusalem Public Schools

Joshua D. Angrist, Victor Lavy, NBER Working Paper No. 6781, November 1998

www.nber.org/papers/w6781

This paper is an impact evaluation of an in-service teacher training programme in Jerusalem. It looks at the training's impact on student's reading (Hebrew language skills) and mathematics achievement, by looking at their test scores. The training was based on teaching methods in US schools. The study compares students from the schools which received the intervention with a matched group of students from those which did not receive the intervention. Using econometric analysis (differences-in-differences, matching and regression) the study finds that training teachers helped to improve student's test scores in non-religious schools but not in the religious schools. The paper also compares the economic value of the training programme to that of reducing class size and having longer school hours, finds that teacher training is a less expensive option.

The impact of individual teachers on student achievement: Evidence from panel data

Rockoff J.E. (2004). *American Economic Review*, 94(2), 247-252

School administrators, parents and students themselves widely support the notion that teacher quality is vital to student achievement, despite inconsistent evidence linking achievement to observable teacher characteristics (Erik Hanushek, 1986). This has led many observers to conclude that, while teacher quality may be important, variation in teacher quality is driven by characteristics that are difficult or impossible to measure. Credible identification of teacher fixed effects requires matched student-teacher data wherein both student achievement and teachers are observed in multiple years. This research uses panel

data on student test scores and teacher assignments to try and estimate more accurately how much teachers affect student achievement.

Evidence presented here suggests that raising teacher quality may be a key instrument in improving student outcomes. However, in an environment where many observable teacher characteristics are not related to teacher quality, policies that reward teachers based on credentials may be less effective than policies that reward teachers based on performance. Test scores do not capture all facets of student learning.

Teacher evaluations may also present a simple and potentially important indicator of teacher quality. There is already substantial evidence that principals' opinions of teacher quality are highly correlated with student test scores (Murnane, 1975; Armor et al., 1976). Moreover, while evaluations introduce an element of subjectivity, they may also reflect valuable aspects of teaching that are not captured by student test scores.

5. Useful general information

SACMEQ - Several useful papers on educational quality:
www.sacmeq.org/research.htm

PASEC (French website) www.confemen.org/

Schools, teachers, and education outcomes in developing countries

Glewwe, P., & Kremer, M, Handbook on the economics of education (2nd ed.) 2005
<http://ideas.repec.org/h/eee/educhp/2-16.html>

A useful resource providing a broad overview of the issues

Of Square Pegs and Round Holes: Training in Developing Countries

F. Henry Healey, *Journal of Education for International Development* 3:2 (2008)
www.equip123.net/jeid/articles/6/Healy.pdf

This article is a brief review of a USAID-funded programme - Education Sector Reform Assistance (ESRA) to support the Government of Pakistan. A central feature of ESRA was its training programmes for several government personnel that included teachers and head-teachers as well. The paper argues that ESRA carried out supply side training before demand side factors were in place – and hence a large number of trained personnel were created. It then questions whether this was the right approach as it did not have the required impact.

6. Additional information

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