

Teacher Human Capital, Teacher Effort and Student Achievements in Kenya

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Evidence gathered over the past 40 years demonstrates that education is important, both at the micro and macro level. Education has been associated with increase in workers' productivity, higher economic growth, improved health status and reduced crime among other non-monetary outcomes.

As a result, efforts at national and global levels over the past decade were devoted to ensuring that by 2015, all children, boys and girls alike, have access to primary education that is free, compulsory and of good quality. At the global level, the Dakar Framework for Action on Education for All and the United Nations Millennium Development Goals (now Sustainable Development Goals) provided overarching political commitments that guided the achievement of this goal. A number of countries in sub-Saharan Africa responded by implementing ambitious and wide-ranging reforms to achieve this goal. For instance, overwhelming evidence that user-fees were a major barrier to access provided the basis for the key reform of making public primary education free.

Across the developing world, the post free primary education era has been characterized by huge investments in school infrastructure. Such increased investment in the sector appears to have paid off. Although there is still room for progress, there is evidence across the developing world that more children are going to and staying in school. For instance, the average net primary enrolment in sub-Saharan Africa increased from 58 percent to 78 percent between 2002 and 2013.

While strides have been made in terms of investment in school infrastructure and access to schooling opportunities, evidence from national and regional student assessments show that learning achievement remains quite low. The status of learning in developing countries is detailed in a recent synthesis by the Center for Global Development.¹ Drawing on evidence from different countries such as Kenya, Uganda, Tanzania, Bangladesh and India, this review reports that many children in developing countries who complete primary school are unable to read a simple passage, perform simple addition, use a ruler to measure the length of a pencil or even tell the time on a clock - skills that are supposed to be mastered at the end of the second year of primary.

¹ Pritchett, L. and Banerji, R. (2013). Schooling is not education! Using assessment to change the politics of non-learning. Technical report, Center for Global Development Washington, D.C.

The weak learning outcomes, particularly in public schools, coming in the wake of increasing public spending on education inputs raises an important research question as to whether school inputs matter for student achievements and if they do, which inputs matter. Recent literature suggests that the challenges of learning in developing countries goes beyond school funding, especially infrastructure and instructional inputs financing. According to this literature, investments in inputs (infrastructure) in front-line service provider units (such as hospitals and schools) in developing countries have merely led to marginal improvements in outcomes because of deficiencies in the incentive structures in those front-line facilities.

In education, this literature stresses on the importance of *teacher input* and more so, the importance of *teacher competence (knowledge)* and *teacher effort* in the delivery of education services. Schools inputs (infrastructure) are crucial for student learning but teachers, as key service providers in the production of education, need to be present, motivated and able to instruct. In other words, conditional on teachers being appropriately skilled and exerting the necessary effort, the provision of school resources and infrastructure has important effects on student achievements. Despite this, the linkage between *teacher knowledge* and *teacher effort* and outcomes has not been fully explored in the context of sub-Saharan Africa largely due to lack of data.

This paper contributes to this body of literature by examining the effect of teacher human capital and teacher effort on student achievement in maths and language in Kenya. We define teacher human capital by two measures: what teachers know (teacher subject knowledge) and whether the teachers know how to teach (teacher pedagogical skill). Teacher effort is measured by three indicators, namely; (i) teachers' effective instruction time, (ii) teacher's ability to keep students engaged during the teaching lesson and (iii) a number of teacher classroom practices. We use the SDI survey data to link these aspects of teachers to student scores by way of an education production function, while controlling for attributes related to students, teachers, schools (including whether the school is private or public) and the communities where schools are located.

Results indicate that teacher subject knowledge and pedagogical skill are critical for student achievements. For example, a one standard deviation increase in the teacher's knowledge in language (mathematics) increases student test scores in language (mathematics) by 0.075 (0.126) of a standard deviation. Teachers who spend more time on instruction related activities and can keep students engaged (on-task) during the lesson are associated with higher student test scores. An additional hour of teacher effective instruction time increases the student language and maths test score by 0.051 and 0.059 of standard deviation, respectively. A number of classroom teaching practices have an effect on student test scores although the effect differs between language and maths. For instance, the practice of using local language to illustrate learning reduces student test score in language by 0.161 of a standard deviation but it has no effect on maths.