

AFRICA'S SKILLS TRAGEDY: Teachers' lack of knowledge explains school students' poor educational outcomes

Schoolteachers in sub-Saharan Africa do not know enough about their subjects to educate their students properly. That is the central finding of research by **Jan Bietenbeck**, **Marc Piopiunik** and **Simon Wiederhold**, to be presented at the annual congress of the European Economic Association in Mannheim in August 2015.

Their study analyses data from the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) to assess the quality of teachers in 13 countries. It finds that replacing an average teacher in a very low-performing country like Lesotho with an average teacher in a higher-performing country like Kenya would reduce the gap in student test scores between both countries by 6%.

Children in African schools often learn incredibly little, with less than a third of sixth-grade students managing to calculate a simple subtraction (compared with two-thirds of fourth-grade students in OECD countries who could solve the problem). The study finds that this is probably because the teachers often do not know their subject in depth, and simply giving out more resources such as textbooks will keep failing if the teachers themselves are not trained properly. The authors conclude:

'A lack of teacher quality helps to explain why providing more resources to schools, in and of themselves, have proven to be so little effective in improving student performance in developing countries.'

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School students' performance in sub-Saharan Africa is tragically low. This study investigates to what extent teachers' lack of subject knowledge can explain this low performance.

Using unique international assessment data for sixth-grade students and their teachers, the researchers find that teachers in sub-Saharan Africa often lack fundamental knowledge of the curriculum they are supposed to teach. This (lack of) knowledge is important for student learning: replacing an average teacher in a very low-performing country like Lesotho with an average teacher in a higher-performing country like Kenya would reduce the gap in student test scores between both countries by 6%.

The study also shows that teacher knowledge and school resources are complements in student learning. This suggests that simultaneously improving teacher subject knowledge and school resources (such as textbooks) can be expected to lead to substantially larger improvements in student performance than raising teacher subject knowledge alone.

Children in sub-Saharan Africa are learning dramatically little in school. For instance, in a large-scale assessment, *sixth*-grade students were asked to calculate the number of remaining pages in a 130-page book when the first 78 pages have already been read. Not even one-third of the students were able to perform this calculation correctly. In contrast, two-thirds of *fourth*-grade students from OECD countries calculated the correct number.

These are alarming findings for sub-Saharan Africa since previous studies have shown that it is the skills of the population, and not the number of years spent in school, that drive economic growth.

At the same time, teachers in sub-Saharan Africa often lack the knowledge essential for teaching the material included in the curriculum. For instance, teachers participating in the above-mentioned assessment had to answer the following math question: ' $x/2 < 7$ is equivalent to (a) $x > 14$, (b) $x < 14$, (c) $x > 5$, or (d) $x < 7/2$?' The same question was given to *eighth-grade* students in 39 developed countries.

In 19 countries, eighth graders did as well or even better than teachers in the worst performing sub-Saharan country (Lesotho), and in four countries they did even better than the average teacher in sub-Saharan Africa. These results suggest that teacher subject knowledge – one main dimension of teacher quality – is dramatically lower in sub-Saharan Africa than in developed countries.

To assess whether teachers' lack of knowledge leads to low student performance in sub-Saharan Africa, this study uses unique data from the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), which provide consistent measures of teacher knowledge in math and reading across 13 countries.

The results show that students clearly benefit from having a teacher with higher subject knowledge. This effect cannot be explained by other factors such as students' innate ability or teachers' work experience or general pedagogical skills.

By far the most popular policy in developing countries for increasing student performance is to provide additional resources to schools. Such resource-based policies are likely to be more effective in the presence of highly knowledgeable teachers.

For example, access to textbooks translates into higher student performance particularly when students are taught by teachers with high subject knowledge. This is an important finding as it suggests that a lack of teacher quality might explain why providing more resources to schools, in and of themselves, have proven to be so little effective in improving student performance in developing countries.

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Africa's Skill Tragedy: Does Teachers' Lack of Knowledge Lead to Low Student Performance?

Jan Bietenbeck, Marc Piopiunik, and Simon Wiederhold, forthcoming as CESifo Working Paper

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