

# **Pedagogical culture and student performance in primary school : Evidence from Cameroon**

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Most children of primary school age in the developing world are enrolled in school, but whether they are learning much remains uncertain. In Africa, there is a large cross-country variation in learning outcomes, often attributed to differences in the type of schooling systems inherited from the colonial period, especially the difference between French-speaking and English-speaking systems. Cameroon was colonized in part by the British and in part by the French before being reunited. This natural experiment allows us to compare both education systems in the same country.

The world is slowly converging to universal primary education, however, quality of education is an increasing concern. In 2000, the UN's Millennium Development Goals focused on enrollment, vowing to "achieve universal primary education" by 2015. The Sustainable Development Goals, unveiled in 2016, vow to "ensure inclusive and quality education for all".

What are the factors of the education production function that matter the most for students' learning outcomes? While building schools and hiring teachers has been extremely important for increasing attendance, test scores do not seem to be very responsive to additional inputs (teachers, textbooks), and improving teaching methods is increasingly seen as crucial for improving students' learning (Kremer et al.; 2013).

Teaching practices are influenced by national culture. Algan et al. (2013) study teaching practices in OECD countries and find that Mediterranean countries such as France put more emphasis on vertical teaching (teachers spend more time lecturing), while Nordic and Anglo-Saxon countries put more emphasis on horizontal teaching (when students are encouraged to work in groups). Cogan and Schmidt (1999) study national teaching practices in mathematics and find that French lessons are characterized by a strong focus on abstract reasoning rather than applied problems. Klieme and Baumert (2001) use the TIMSS survey to show that these differences are reflected in the kinds of questions the students of each country answer the best.

Colonial history weighs heavily on present-day African education systems. The British colonial legacy in education, in particular, is often presented as more favorable. In their African colonies, the British favored missionary education, cheap and demand-driven, while the French favored a centralized and expensive public system. British colonies had higher enrollment rates during the colonial period, and the difference seems to have persisted (Brown; 2000; Grier; 1999; Cogneau and Moradi; 2014). Today, colonial origins are said to be manifest in public sector teachers' wages, higher in Francophone countries (Mingat and Suchaut; 2000), grade retention, practiced on a much larger scale in Francophone education systems (Bernard et al.; 2005; Ndaruhutse et al.; 2008), and teaching practices.

To study the effect of colonial origins on student performance in primary school and pedagogical culture, we use Cameroon's history as a natural experiment. Cameroon was divided between the British and the French after World War I, before being reunited in 1961. Today, two educational sub-systems coexist in Cameroon: an Anglophone sub-system in the former British part and a Francophone system in the former French part.

Dupraz (2017) studies this natural experiment, focusing on the history of school enrollment at the border. He finds that after partition, school enrolment increased more rapidly at the border in the British part, but that this initial divergence was quickly erased when the French increased education supply after World War II and because of favoritism towards the

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Francophone side after independence. However today, Cameroonian schooled in the Anglophone system are more likely to finish high school, a fact he attributes to high repetition rates in the Francophone subsystem and their detrimental effect on dropout rates. His data does not allow him to explore differences in school quality and learning outcomes between the two systems.

We use school survey data from the PASEC and border discontinuity analysis to study differences between the two sub-systems. Doing so confronts us to a problem of multiple treatment: first, colonizer identity matters for many dimensions of social, cultural, and economic life that could influence education. Second, identifying differences between two subsystems does not necessarily tell us which elements of a subsystem are responsible for better or worse outcomes. We try to tackle the first problem by controlling for relevant confounding variables, while we try to tackle the second by undertaking mediation analysis and gauging which element of the education production function are responsible for differences in students learning.

Despite these problems, Cameroon offers a unique setting to explore differences in education systems. While there are other example of countries where two culturally different education subsystems coexist (Quebec and Belgium spring to mind), these different subsystem were not exogenously imposed by a colonizer and exist because of long-term cultural differences between regions of the same country. Cameroon is the only case where the existence of two different subsystems can be thought of, at least locally, near the border, as random.

We find no difference in language scores between the two systems. In mathematics, students schooled in the Anglophone system might perform better in the end of the second year of primary school, but they clearly perform worse in the fifth year of primary school, which test scores lower by more than half a standard deviation. Though rates of grade repetition are higher in the Francophone subsystem, we show that selection is not driving our results.

Estimating discontinuities in various inputs of the education production function, we find evidence that schools in the francophone system are advantaged in terms of class equipment, and (weaker) evidence than Anglophone teachers use more horizontal teaching methods. We also find that the Anglophone advantage in class 2 is driven by questions asking to apply mathematics in real-life contexts. But when we undertake mediation analysis, we are unable to explain differences in achievement by any of the observable inputs of the education production function. We conclude that unobserved differences in pedagogical culture and teaching practices might explain differences between the two systems.

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