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## What works to improve the quality of student learning in developing countries?

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### ABSTRACT

We conducted a systematic review to identify policy interventions that improve education quality and student learning in developing countries. Relying on a theory of change typology, we highlight three main drivers of change of education quality: (1) supply-side capability interventions that operate through the provision of physical and human resources, and learning materials; (2) policies that through incentives seek to influence behaviour and intertemporal preferences of teachers, households, and students; (3) bottom-up and top-down participatory and community management interventions, which operate through decentralisation reforms, knowledge diffusion, and increased community participation in the management of education systems. Overall, our findings suggest that interventions are more effective at improving student performance and learning when social norms and intertemporal choices are factored in the design of education policies, and when two or more drivers of change are combined. Thus, supply-side interventions alone are less effective than when complemented by community participation or incentives that shift preferences and behaviours.

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### 1. Introduction

Since the seminal work of Becker (1962) and Schultz (1961) on the theory of human capital, education policy has been increasingly the object of research, for its intrinsic importance but also for its instrumental value in the improvement of society. Theoretical economic models have emphasised the role of schooling in determining the returns to education that ultimately foster economic growth (Lucas, 1988; Becker et al., 1990; Rebelo, 1991; Romer, 1994). Empirical studies show that education and the policies that facilitate the process of innovation and knowledge creation have profound effects on the long-run economic growth and development patterns (Barro, 1991; Rebelo, 1991; Benhabib and Spiegel, 1994; Barro and Sala-i-Martin, 1998). The benefits of information and knowledge diffusion in facilitating economic transactions, productive arrangements, social interactions, and political participation are also widely acknowledged (Sen, 1999).

Investing in human capital through education policy has been a growing priority for developing countries since the post war era, and such efforts are often supported by foreign aid. During the

1970s and 1980s, and with many African nations achieving independence from colonial powers, much of the education aid focused on improving access to education via supply-side policies, such as the construction of schools and the provision of equipment (Coombs, 1985; Tilak, 1988). These policies were expected to lead to enhanced productivity, economic growth, and development. In addition, improving teaching abilities via training of teachers and reforming learning materials was funded as an effective way of enhancing education quality (World Bank, 1980). During that period, around 50% of all bilateral co-operation aid went to secondary education, and nearly a third to tertiary and technical education. These sectors were, in fact, regarded as catalytic for growth and development (OECD, 2012). It was not until the late 1980s that education aid and public policies began to shift towards improving access to primary education, as the latter was recognised to have the highest economic returns in developing countries (Psacharopoulos, 1981, 1985; Psacharopoulos et al., 1986; Petrakis and Stamatakis, 2002; Psacharopoulos and Patrinos, 2004; Asiedu and Nandwa, 2007). The shift was followed, in 1990, by the World Declaration on 'Education for All', adopted by the United Nations Educational Scientific and Cultural Organisation (UNESCO) and other multilaterals and more recently by the current formulation of the Millennium Development Goals (MDGs), where access to education represents a cornerstone for expanding human

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capabilities and freedoms (UNESCO, 2007). This approach has since become the dominant paradigm of education aid in the developing world (see Riddell and Niño-Zarazúa, 2016, in this issue).

More recently, the education aid policy debate has gradually shifted from access to schooling to improving learning quality. The transition is likely to dominate the post-2015 global development framework for education development, and can be explained by two important factors: firstly, growing evidence emphasises that quality of education is what matters for economic development. Hanushek and Kimko (2000) and Barro (2001), for example, find that test scores are better predictors of real per capita GDP growth than years of schooling attainment. Hanushek and Woessmann (2008, 2012), Hanushek et al. (2010), Jamison et al. (2007), Laurini and Andrade (2012), and UNESCO (2011), among others, show that cognitive skills are more strongly associated with increases in earnings and development outcomes than schooling attainment.

The second factor is the recognition that poor quality of education remains endemic in developing countries. UNESCO (2014) reports that 250 million children are functionally illiterate and innumerate despite 50% of them having spent at least four years in school. Similarly, in India, more than half of all grade five students' reading ability stands at grade two level (ASER, 2015). Teacher qualifications and attendance is equally problematic with less than 75% of primary school teachers in developing countries being trained according to national standards (UNESCO, 2014). Along the same lines, Glewwe et al. (2010) report that teachers from rural schools in Kenya were absent 20% of the time; while, in Zambia and Pakistan, teachers were absent, respectively, 18 and 10% of the time (Das et al., 2004; Reimers, 1993). Other supply-side concerns such as overcrowded classrooms, lack of teaching material, and poor infrastructure are also obstacles for good learning environments. In sub-Saharan Africa, the rapid increase in school enrolment rates accompanied by low teacher recruitment means that the pupil-teacher ratios in primary education is now exceeding 40:1 (UNESCO, 2014). Demand-side factors such as discriminatory social norms, group incentive dynamics, and intertemporal choices can also influence the utilisation of education services.

Previous analytical review studies have examined the relationship between policy design and cognitive skills and learning at various levels of education, while focusing largely on supply-side interventions (Glewwe, 2002; Kremer, 2003; Glewwe and Kremer, 2006; Kremer and Holla, 2009; Glewwe et al., 2014). Recent systematic reviews have focused on a number of issues including (i) assessing the effectiveness of policies that improve enrolment in primary schools (Petrosino et al., 2012); (ii) supply-side and demand-side factors in school attendance and learning (Krishnaratne et al., 2013); (iii) school-based interventions looking exclusively at the evidence from randomised control trials (McEwan, 2014) and (iv) studies with a specific regional focus (Conn, 2014). This study contributes to the existing debate by conducting a systematic review of the literature on education policies that specifically target the quality of student learning at basic education level in developing countries. In line with this focus, we decided to consider test scores and depart from the examination of outcomes such as school enrolment and attainment, pupil-teacher ratios, drop-out rates, and repetition rates. The choice is motivated by the fact that mere indicators of enrolment and attainment do not necessarily capture the quality of the delivered education, and the level of students' achievement (UNESCO, 2014). Our study collects evidence from experimental and quasi-experimental studies, and, overall, our findings suggest that interventions are more effective at improving student performance and learning when social norms and intertemporal choices are factored in the design of education policies; and when a combination of policy approaches is adopted. We conclude that

supply-side interventions are less effective alone than when complemented by community participation interventions or by incentives that shift preferences and behaviours.

The remaining of the paper is organised as follows: Section 2 presents a theory of change typology, outlining the drivers that facilitate improvements in education quality in developing countries, while Section 3 presents the systematic review methodology. Section 4 presents the synthesis of evidence, which is divided into three groups: (i) supply-side capability interventions, (ii) incentives for changing preferences and behaviours, and (iii) participatory and community management interventions. Finally, Section 5 concludes by discussing the findings and drawing some possible policy implications.

## 2. Policy innovations to improve education quality and student learning: a theory of change typology

We begin the discussion by developing a theory of change typology based on the systematic review. The theory of change involved, first, the identification of the targeted outcome, which in our case is student achievement as measured by test scores in reading, writing and mathematics. Secondly, the theory of change identified various transmission channels through which policy strategies impact education quality in developing country contexts. Typically, a variety of interlinked factors affect the desirable outcomes overtime. Therefore, it was important to disentangle the short-term from the medium and long-term objectives that also influence targeting mechanisms and the process of impact evaluation of policies.

From the systematic review analysis, we were able to identify three main drivers of change for advancing education quality and student learning in developing countries (see Fig. 1). These consist of (i) interventions aiming to enhance the supply-side capabilities of education institutions, (ii) interventions targeting supply-side and demand-side changes in preferences and behaviours that affect the utilisation of education services, and (iii) bottom-up and top-down participation and management interventions. In the following sections we discuss these drivers of change in more detail.

### 2.1. Supply-side capability interventions

Supply-side interventions aim to raise student achievements by targeting infrastructure or organisational deficiencies through, for example, improving physical infrastructure, providing teaching materials, and training and hiring extra teachers. Financial resources provided by governments and/or aid-funded programmes can take the form of directed or generalised financial allocations to improve physical conditions of existing schools (as in Paqueo and Lopez-Acevedo, 2003; Bjorkman, 2004; Barrera-Osorio, 2007) or involve the construction of new schools (as in Burde and Linden, 2013). Other studies have also examined the allocation of financial resources to provide school materials such as computers, flip-charts and textbooks, which support the learning process and improve teaching quality (see for example Barrera-Osorio and Linden, 2009; Glewwe et al., 2004; Vermeersch and Kremer, 2005; Glewwe et al., 2009; Evans et al., 2009; Banerjee et al., 2007; Linden, 2008; He et al., 2008; Muralidharan and Sundararaman, 2010).

Supply-side education policies have also focused on hiring extra teachers, so as to decrease the prevailing high teacher-pupil ratios in many developing countries, and also complement permanent teachers with younger, often more motivated, temporary teachers (see e.g. Duflo et al., 2015; Asadullah, 2005; Linden, 2008; Muralidharan and Sundararaman, 2011). Finally, supply-side policies have also taken the form of management related

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