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Low-fee private schools and the teaching of mathematics in Sub-Saharan Africa

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Abstract

This review paper summarises direct experience with and studies of low-fee private (LFP) schools in sub-Saharan Africa (SSA). Parental fee payments mean a direct contractual link between family and school that is not present at government schools: it means that teachers must show up and teach most of the time, and look after the children in their charge for the duration of the school day. This schooling phenomenon has its roots in the 1990s, but despite being directly accountable, low-free private schools have not proven a solution to the challenge of low educational quality in SSA school systems. In this paper, I will describe the development of this shadow system, the scientific studies on the pros and cons of these schools as well as discuss the reasons why even the most structured LFP schools have not lived up to their supposed promise.

Introduction

Throughout the entire post-colonial period, sub-Saharan African education systems have been in a state of great difficulty resulting from the pressures of rapid expansion, part of 'the world educational crisis' as described by Philip Coombs of UNESCO as early as 1967 (Coombs, 1968). This was rebranded by UNESCO in 2014 as "the global learning crisis", but Coombs' description of the dearth of well-prepared teachers could have been written now, and his warning of "errors harden[ing] into habits able to resist even the stoutest of hammers later used against them" has an unfortunately canny ring to it (Coombs, 1968, p. 6).

Children often emerge from primary school in SSA illiterate and innumerate. At the risk of sweeping generalisation, government school systems fail to ensure that conditions are conducive for teachers to be reliably in class and teaching and that all of the necessary material supports are present. The reality is schools that are severely overcrowded with pupils who lack much in terms of practical and material support in their households, armed only with aspiration. Overwhelmed, under-educated and unsupported teachers find it hard in such circumstances to sustain dedication and commitment to their work. Various writers in the 1960s were already warning of teacher shortages and the perils of filling classrooms with 'volunteers' (Hansen, 1965; Indire & Hanson, 1971).

Enter the low-fee private school (LFP), which has mushroomed across a large number of national and sub-national contexts (Rose, 2002), firstly in poorer urban areas, and increasingly in larger villages. While debate rages regarding the desirability of this trend, individual school proprietors in ever-growing numbers go about their daily business of providing education after a fashion. It is now widely accepted that these schools exist, for better or for worse, and the debate moved on some years ago to whether these schools were providing reasonable quality (Härmä, 2021). Now questions swirl about their contribution to the achievement of Sustainable Development Goal 4 (UNESCO, 2021), something the proprietors themselves likely are not much concerned about. The central question regarding these schools is whether low-fee private school teachers (for whatever reason) teach more effectively than their government school counterparts. If they are found to do so, is this what explains the higher raw test scores that pupils at these schools achieve, and further, if this is the case, can this power be harnessed? Whatever the answers, the circumstances that gave rise to the LFP phenomenon are ignored or discounted at policymakers' peril.

This article does not go in depth into questions of pedagogy or teacher training for the teaching of mathematics – these are questions for other articles in this volume. This article will consider the current situation of teaching mathematics in LFP schools in SSA drawing in particular on studies from Kenya, Ghana and Nigeria, and also on my many personal experiences in observing lessons in such schools during research studies on their incidence, costs and accessibility (my work can be found at www.joannaharma.net and in Härmä, 2021). The next section will provide some background on low-fee private schooling in sub-Saharan Africa. Next, I explain how learning levels are generally low, before moving on to explain why this is the case even at private schools. The following section considers whether private schools are innovating as expected by some commentators. The final section draws out some of the key issues, some tentative suggestions, and concludes.

Background

There is ample evidence of the sorry situation in government school systems as regards learning (see UNESCO's annual monitoring report series starting in 2002 (to present)). Elite private schooling is not new, and schools serving middle-class families have existed for decades in most countries in the South. Mission schools have provided probably the oldest presence of non-state schooling in most countries, often from before there was state schooling in its current (colonial-style) form (Nishimura & Yamano, 2013), and in many countries post-independence, these schools have been partially absorbed into a state system of provision, with a variety of arrangements including the deployment of civil service teachers to mission-run schools. This form of state support has had the effect of making these schools closer to public than truly private (meaning, user-fee-funded) provision (Kingdon, 2007).

For the most part, it is where the money comes from for running the school that is the crucial factor here, and this article focuses on a newer development dating mostly from the 1990s, and which has gathered pace over the intervening years. This is the advent of the LFP school, entirely dependent on the fee income from parents for its survival (Tooley & Dixon, 2006; see Härmä (2021) for a full discussion of how 'low fees' are defined). The fee payment means a direct contractual link between parent and school that is not present at government schools: it means that teachers must show up and teach most of the time and look after the children in their charge for the duration of the school day. This schooling phenomenon has its roots in the 1990s when individuals within a community started to notice a lack of some kind (either no school at all close enough to home, or teachers not performing their duties sufficiently), and started to teach groups of neighbourhood children. From a small tutoring group, at the request of parents, primary schools have been born (Tooley, 2009).

As the trend has grown, it has become more common for an individual to start a new school with intention, from just a handful of children at least nominally divided into pre-primary classes and primary one or possibly even primary two. As they attract parents, schools grow and add a grade level year after year. Such schools are housed in a great variety of types of structures: apartment buildings, unfinished houses or converted houses, shipping containers, shops, churches, flimsy shacks or just under trees. Some have low walls made of some type of blocks, possibly of mud, with timber struts supporting a roof structure. Nearly all of the latter types have corrugated iron or tin sheet roofs and earth floors. Some schools are housed in a mix of structures because there have not been the necessary funds to build a substantial school building; some have to be split between different sites within the community because land is difficult

to come by in dense, urban environments (Härmä, 2021).

Some schools might have a few weak light bulbs, but often there is no source of power at all, or if there is wiring for lights, power cuts make this extremely unreliable. Many do not have any toilets at all or have basic pit latrines. There are usually desks and benches for children to sit on, but in some countries where I have observed schools, there are none. What teaching and learning materials there are is usually extremely limited, with parents not buying the textbooks, or buying them one at a time across the first half of the year, and teachers usually have only the textbook to work from, and a chalkboard. Teachers in these schools are often unqualified as per government standards, but this varies greatly from one country to another and depends on the flow of graduates emerging from teacher training colleges (Härmä, 2021).

Such schools are often illegal and unregistered with education authorities because governments tend to have very demanding regulations regarding private schools, often far surpassing what is offered at public schools (Baum et al., 2018). In addition, dealing with government authorities tends to involve the payment of bribes in order to become registered or in order to avoid being closed down due to lack of registered status (Baum et al., 2018). No country that I have conducted research in where there is a thriving LFP market has managed to develop an effective regulatory system for these schools (Härmä, 2021).

The key message is that these schools are characterised by informality in both staffing and infrastructure. What is taught is an exception to this overall informality: LFP schools invariably teach the national curriculum because this is what parents demand. Parents are voting with their feet in what seems to be ever-increasing numbers[1], but a key question (of many questions, including whether these schools exacerbate inequality and further undermine government systems) is whether these schools are doing any better than government schools. Is the investment by parents with scarce financial resources worth it (Srivastava & Walford, 2016)? The next section addresses the crucial quality issue, focusing on the teaching of mathematics.

What does the data tell us about learning at LFP schools?

Parents perceive that private schools do better than government schools in a number of areas, however, there is no data, nothing concrete by which parents choose (Dixon et al., 2017). Their choices tell a story of dismay with government-provided schooling and desperation for something better. I have written extensively about parents' perceptions of school quality elsewhere (Härmä, 2013, 2016, 2021), so this article will focus on a handful of studies that have looked into learning levels in detail.

1 Space constraints here mean that the incidence of attendance at private schools cannot be addressed here. For particular examples see my open access reports on Lagos, Nigeria (Härmä, 2011; Lagos State Ministry of Education, 2011), and Kampala (Härmä et al., 2017). See also the UNESCO (2021) which focuses on non-state actors in global education.

Overall learning levels are low

Firstly, there is a relatively long list of studies that have used test scores, taking into account ('controlling for') aspects of children's family background (their socioeconomic status) via econometric methods using a range of proxy and direct indicators of status and wealth. It is probably a majority that finds some degree of 'private school effect', meaning that even considering that private school pupils tend to come from generally more privileged households, there is still an advantage to be gained by attending private school. There are studies from Kenya (Bold et al., 2013; Wamalwa & Burns, 2018; Baum & Riley, 2019; Alcott & Rose, 2016 – the last study found this for Uganda as well). Tooley and Dixon find such an advantage in Ghana, Nigeria and India (Tooley & Dixon, 2006; Tooley et al., 2010). Many researchers find similarly for India (Alcott & Rose, 2015; Goyal & Pandey, 2009; Kingdon, 2007; Muralidharan & Kremer, 2008).

These studies finding 'private school effects' of varying magnitudes must be understood in their contexts of very low learning levels overall, so the actual 'value-add' of private schooling at the lower end often means a child's learning is somewhat less terrible than it would have been had the same child attended a government school. To illustrate the point: Ghana's National Educational Assessment of 2018 defines minimum "competency" as achieving at least 35 percent correct answers, and on the test of mathematics for primary 4 pupils, nearly half of the sampled children (48 percent) were unable to reach this very low bar. One-third scored 35-54 percent, while less than one-fifth were able to achieve at least 55 percent correct (Government of Ghana, 2018, p. 8). Considering public and private school pupils separately, the average scores were 37 percent and 54 percent correct, respectively (Government of Ghana, 2018, p. 17). Math scores were considerably lower than English scores, despite English being a non-mother tongue for most children. Similarly, in two Lagos studies comparing school types, scores for private school students (mostly attending LFP schools) were significantly higher than for government schools (EDOREN, 2018), and significantly higher in literacy than in math. In private schools in four areas of Lagos, just over half of primary 3 pupils had mastered the literacy curriculum, while this drops to only 6 percent in numeracy (EDOREN, 2015).

These snatches of data illustrate the macro 'take-away': that learning levels are low across the board except at more expensive schools (Ngware, 2013; EDOREN, 2015). Yet not all private schools targeting the relatively poor are made equal. Returning to the 2018 Lagos study cited above, it was actually aimed at evaluating the quality of Bridge International Academies' (Bridge) schools in relation to both government schools and the usual locally-owned LFP schools. Bridge is a multinational chain of relatively low-fee private schools targeting many of the same low-income areas as LFP schools, but at a somewhat higher price point than many. Bridge came up with a model for complete standardisation across a large number of school locations, 'teacher-proofing' the schools by providing them with scripts to be read word-for-word from an e-reader. Teachers in these schools are to deliver only what is in their scripts which are downloaded every week, and which are purported

to include answers to all types of student questions on the subject material. This means that teachers do not need to be trained in pedagogy or lesson planning because this is all decided for them at the company's 'back end' in the United States.

The company has spent enormous sums of money on research and development of the model (see Riep, 2019) that is touted as being so thoroughly standardised that teachers are rendered essentially interchangeable. The company provides a few weeks' crash course in using the e-readers with their scripts, in classroom management, and in marketing the school within the community. They train more teachers than they have roles for so that when a teacher leaves (high turnover being endemic to LFP schooling), they can quickly deploy a replacement. Each Bridge school teacher in a particular grade level in a given country should be delivering the same scripted lesson in the same way at the exact same moment of the school day, across all school locations.

Having given a sizeable grant to the company to aid its start of operations in Nigeria in 2015, the UK government funded an evaluation study of how Bridge schools were performing in terms of children's test scores in literacy and numeracy (EDOREN, 2018). The research team set the assessment based on the primary school curriculum and found that while Bridge schools had a statistically significant advantage over LFP schools and government schools in literacy, in numeracy, while there was, of course, an advantage over government schools, Bridge schools were found to have no advantage over individually-owned LFP schools *despite a truly enormous gulf between the school types in terms of the investment and research that has gone into the Bridge model*. This evaluation's findings indicate that it is the LFP model itself, rather than any particular way of running such a school, that proves a barrier to providing education of objectively good quality.

Why are things so bad even at private schools?

The challenge of poverty

This section turns to a consideration of what challenges confront private schools in efforts to teach mathematics – many of which are shared with government schools and with different subjects. First and foremost for all schools serving disadvantaged groups, especially in poor countries, is the challenge of teaching children growing up in poverty (Ogando Portela & Atherton, 2020; see Härmä, 2021, especially chapter 5, for a discussion of the roles of poverty and family background in children's learning, using global evidence). Studies find a crucial role played by poverty in learning, with schools struggling to make up for household deficits (Alcott & Rose, 2016). Whether living in an urban informal settlement or in a rural village, there is often little space within the home that is amenable to studying hard and doing homework. Distractions abound, and lighting might be hard to come by for evening homework. As soon as the child is home from school, there are chores to do, siblings to care for, and games to be played with neighbouring children. Added to this is the usual lack of a basic literate environment within the household. It may be the dearest wish of the parents that their child gets a good education, but they might not be able to help at all with homework, and may not realise how much support for the child's learning is needed. Children also lack access to textbooks and even writing materials (Akaguri, 2011; Fredriksen et al., 2015; Milligan et al., 2017; Härmä & Moscoviz, 2019). LFP school parents are responsible for buying the textbooks their children need, and yet many do not, because they stretch their finances terribly in order to afford the school fees of the most expensive-possible school within their reach, leaving them little to no funds to pay for the necessary materials (Härmä & Siddhu, 2017; Härmä & Moscoviz, 2019). These challenges are not to be underestimated, and they are impossible for any school to fully compensate for.

The lack of a dedicated & stable teaching workforce

Yet schools can make some difference, and teachers are the most important single aspect of school education. The idea of what a good teacher needs usually includes a good knowledge of the material they are teaching, gained from a good education; effective pre-service teacher preparation; a high degree of motivation, and a view of teaching as a vocation; and the teacher should be working in conditions that are supportive of their work in terms of both physical conditions and support from colleagues and the wider school community.

I argue that many of these conditions for teachers to excel are missing for possibly the majority of teachers of disadvantaged children in SSA. In LFP schools, there are considerable challenges, and there is a key inherent flaw of the model: turnover of the workforce. Low-fee schools mean there is little revenue from which to pay teachers, so salaries are very low, impacting morale and leading to high teacher turnover, something reported in every context in which I have studied this schooling type. Teachers are willing to leave one school for another where there is an offer of even slightly higher pay, leading to low levels of commitment to and investment in their staff on the part of school proprietors. With extra training under their belts seen as a selling point, there is no incentive for proprietors to invest in training, meaning no real, meaningful upward pressure on quality. Each new hire is seen as good enough for now, and until they move on (Härmä, 2021).

Today's young teachers have received a sub-par education themselves

Many teachers in SSA have insufficient subject content knowledge (Akaguri, 2011), which proves an insurmountable barrier to truly high-quality teaching and learning. In addition, teachers of lower grades and pre-primary classes commonly have lower status and pay, and less well-qualified individuals are deployed to this level. This is arguably a dangerous combination, especially for mathematics, as early learning in this area from the youngest ages is what all future learning is built on. In some places, virtually the entire teaching workforce is unfit, most likely due to the poor education that they themselves received. In Nigeria,

in 2008, all government primary school teachers in Kwara State, where I lived, were tested in four subjects at the primary 4 grade level of difficulty. Seventy-five out of 19,125 teachers passed (requiring an average score of 80 percent or higher). Many (259) failed to score any mark at all (ESSPIN, 2008, p. 2), but this should not be regarded as specific to one of the poorer and more remote Nigerian states. A similar assessment was carried out in the richest part of the country, Lagos, with results even worse than Kwara's (as the Governor refused to publish the findings, I was only able to learn about the Lagos assessment from my Education Sector Support Programme in Nigeria colleagues, who conducted the assessment).

In Nigeria, as in Kenya (Ngware, 2013) and so many other contexts where civil service teachers stay in their posts for decades due the job security and lack of accountability, government teachers are considerably older than those teaching in LFP schools. LFP teachers tend to start work at their first LFP school fresh from secondary school or some tertiary education (including teacher training in some countries), or during a break from their own studies. It is likely that many of yesterday's LFP teachers could have been educated by older government teachers like the ones assessed in Kwara State – and today's young LFP teachers might have been taught by yesterday's LFP teachers (or government teachers). It can therefore be no surprise if LFP schools fail to foster high levels of learning despite being more accountable. Logic suggests that there must be a ceiling to what a person can achieve (serving in the role of a teacher) who does not have a grasp of the subject matter. One retired civil servant from Uganda described the situation where unqualified individuals cheat their way into teacher training colleges: "Such fools later become 'teachers' and end up fostering the next generation of fools in the classes that they teach. It is not a surprise that we have many children failing their primary school exams" (Kisira, 2008, p. 166).

Returning to the extremely detailed study by Ngware, we learn that teachers across government and private schools in the six urban areas in the sample have worryingly low levels of subject content knowledge – the basic building block for becoming a good teacher. To begin with, 95 percent and 70 percent of government and formal private school teachers (respectively) were qualified, while only 41 percent of LFP teachers were (Ngware, 2013, p. 59). Government school teachers scored 52.2 percent on the subject content test; formal private school teachers scored 51.3 percent, while LFP teachers achieved 54.7 percent. The teachers were even weaker on pedagogical knowledge, with scores of 44 percent (LFP), 45 percent (government), and 47 percent (formal private) (Ngware, 2013, p. 67). It is noteworthy that there is so little variation even in this area when the majority of LFP teachers have not been through pre-service teacher training. It is significant too for the argument of this article that teachers in no sub-sector came out stronger than the others – their characteristics varied, but not in line with their scores on the tests administered to them.

This article purposefully avoids making assumptions regarding teacher qualifications. There is a rich literature on the deficiencies of initial teacher education programmes in SSA (Abadzi, 2006). Akyeampong et al. (2011) describe teacher training in six African countries, and even where this training appeared more organised, the report pointed to issues with the teaching of core concepts to build conceptual understanding on which to build, instead of memorisation of steps to follow to solve problems.

Are private schools innovating?

'Innovation' is a key buzzword often attached to private sector initiatives, especially in education. Public schooling globally is often characterised as stagnant, while private sector actors are supposedly incentivised by market forces to innovate and find new and better ways of doing things. Innovation is often sought even in the LFP sector where it operates, with the expectation that private actors will come up with more effective ways of fostering learning. However, I have not witnessed innovation in the hundreds of LFP schools that I have visited, where the methods are traditional chalk-talk methods, with question-answer sessions between teacher and pupils that usually do not include probing for a deep understanding of the subject matter. Returning once again to Ngware (2013), the researchers provide great detail on the key types of classroom activities that take place in the study schools, with no particular variation in style between school types.

There are considerable claims to innovation from larger school chains such as Bridge and SPARK Schools in South Africa. However, this 'innovation' does not reach the level of pedagogy: SPARK has made claims regarding innovation in a collaboration with Google for Education, but the detail revealed that this was only to do with the way teachers handle student assignments (itslearning, 2018). Bridge has innovated in how to manage in a context of poorly-educated teachers, with their tech-enabled management systems and the instant distribution of scripts to teachers to read from (Riep, 2019).

During my own time in LFP classrooms in SSA, I saw that Bridge schools 'innovated' through some puzzling classroom management techniques borrowed from the Charter School movement in the United States, but things were quite standard when it came to the delivery of the subject content. I observed mathematics being taught similarly to other schools as witnessed from the beginning of my own experience in school. In the common LFP school, I have witnessed lessons in all subjects that have been dull, slow-moving and devoid of energy, often involving copying from the board due to pupils' lack of textbooks (much class time is wasted in this way in SSA; see Abadzi, 2009; Akaguri, 2011). On the other hand, on my final day in the field on my last research project in rural Ghana I sat at the back of a small, cramped makeshift classroom with perhaps 15 pupils in it, with a very young (perhaps 22 years old) teacher conducting an inspired lesson on triple digit subtraction with borrowing. I could not say that there was innovation on display during this lesson, but the teacher was a natural, engaging with his students and patiently coaching as students worked through examples on the board, constantly reinforcing the concept of place value and probing for comprehension. I argue that in light of the current level of teacher education and the

poor state of initial teacher education for the teaching of mathematics at the early primary level (Akyeampong et al., 2011), innovation is a distant dream, and private sector schools do not offer any clearly differentiated product; they do not offer higher quality pedagogical approaches, based on observation of teaching methods rather than just test scores, and this is well explained in the in-depth study carried out by Ngware (2013) in Kenya. One caveat to this conclusion which still might not prove the innovation point, but proves a point of differentiation: research on this schooling model in fragile and conflict-affected states has found that there is less to fear in terms of indoctrination and hardening of perceived differences between communities as compared to state managed systems (Tooley et al, 2020). If this is the case, any reduction in conflict risk can be seen as an enabling condition for learning to take place.

Discussion and conclusions

The magnitude of the overall challenge in SSA is enormous. It cannot be a surprise that teachers struggle to teach mathematics effectively, when they do not have a repertoire of ways in which to explain and re-explain differently the mathematical concepts that they must teach. Indeed, teachers are documented as being unable to ascertain through appropriate questioning techniques whether their students understand what they are teaching – and where teachers do not know the understanding level of their students, how can they address students' issues? On the other hand, what good can such knowledge and techniques be when confronting a class of 80, 100, or even 150 students, as I have witnessed in some Nigerian public schools? In such a setting, the teacher only launches forth explanation at the front of the class and can only hope some students might grasp some of it. Another important factor enters in, especially in more rural settings – when higher primary grades' (and above) math content is taught and exams are set in a colonial language that is not the mother tongue of the student, it becomes complicated to ascertain where problems are truly problems of math learning or language fluency. This adds a whole new level of complication on top of the low-skill and high turnover of LFP teachers.

This article explored the role of low-fee private schools in the teaching of mathematics in SSA, but one of the key issues, the subject knowledge and pedagogical skill levels of the teachers involved appears to be a common issue confronting all types of schools. As the Ugandan civil servant cited above bluntly pointed out, such unskilled teachers will beget unskilled school leavers, some of whom will inevitably become the unskilled teachers for the forming of the next unskilled generation. The example of Bridge International Academies shows that there is only so far a model can develop when teachers are young, poorly paid, ill-educated, and untrained or effectively untrained as a teacher. This challenge of poor education is happening at full scale now, which means that there are no particular places where well-prepared teachers can be found who might help rectify this situation. No intervention or fix or crutch – such as the scripts of Bridge – can quickly address issues of such depth, breadth and profundity. The aim must be to build improvement in education systems slowly and surely, rather than trying to sprint to some imagined 'good quality finish line'. Rather than testing children, national systems may do well to keep track of the knowledge levels of their teachers by testing them instead, but only if the test score data can feed back into teacher training systems that then offer remedial instruction to budding teachers whose own education has been sub-standard (which is probably most of them). Realistic suggestions must be conservative and based arguably on an expanded mathematics subject content knowledge base for teachers. Then, developing pedagogical subject content knowledge must follow – yet the question remains as to where the teacher trainers of the requisite quality are to be found.

With regard to the specifics of low-fee private schooling, the key challenge is teacher turnover which disincentivises proprietors' investment in training. Those coming from a rights-based perspective in particular question why teacher salaries are so low in these schools (largely prompting this turnover). It is, for the most part, not out of an intention to exploit teachers. Something that must be understood about these schools is that they are entirely a product of their environments – and this means they are part of the informal economic sector of the informal settlements or villages where they exist. The clients these schools serve are usually employed similarly in the informal sector and often earn precariously and unpredictably. The fees that such parents are able to pay are necessarily low, and so a member of such a community who plans to start a school knows that it will only take root if the fee level is within reach for local families. It is for this reason that teacher salaries are so low, and teachers chop and change in search of even a vanishingly small increase in wages. Another aspect noted about these schools is that teachers are not protected by formal work contracts with clear terms and conditions – yet this cuts both ways, and proprietors find themselves down one member of staff at any moment during the school year and are forced to scramble to find a replacement quickly. They are loath to have to find such replacements, so they are not as quick to discipline and sack teachers as is often supposed. Coupled with this, salaries being what they are, teachers care less about losing their jobs than they otherwise might, which explains why teacher attendance at these schools is still far from perfect.

None of this spells success in mathematics learning, although the LFP model clearly has some benefits. Firstly, class sizes tend to be smaller than in government schools and are sometimes very small. The pupils are almost always significantly better-off than their government school peers, and while they may come from the exact same communities, the better-off in the neighbourhood will self-select into the private sector. In order to keep their jobs, LFP teachers must show up most of the time and put some effort in, even if they are not as motivated as one might like. Under such conditions, to the limited extent that teachers have the knowledge and some ability to convey subject content, it is much easier to do this in small private schools than in overcrowded, chaotic government schools. LFP teachers, therefore, experience a clear head start in relation to government school teachers, while at the same time, it appears that there is very distinctly a ceiling to what can be achieved where teachers have only a partial or shadowy grasp on the subject matter and no real

knowledge of pedagogical approaches. The Bridge model has illustrated that no amount of scripting and scaffolding is enough, and conditions in schools must be slowly improved to support newly trained teachers who should receive remedial subject and pedagogical methods instruction.

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