International Journal of Educational Development 36 (2014) 3–12

Contents lists available at ScienceDirect

International Journal of Educational Development

journal homepage: www.elsevier.com/locate/ijedudev

Does teaching style explain differences in learner achievement in low and high performing schools in Kenya?

Moses W. Ngware, Moses Oketch *, Maurice Mutisya

African Population and Health Research Centre, Nairobi, Kenya

ARTICLE INFO

Keywords:
Teaching practices
Primary schools
Math
Learning achievement

ABSTRACT

Quality of instructional delivery is an important determinant of the extent to which the teaching process has an impact on learning achievement. The literature identifies many contributors of learning achievement including teacher, curricula, teaching, student, home and school environments. On an 'education production function' approach, achievement may be modelled as an outcome determined by school and classroom based inputs. The processes of achievement determination are typically assumed, in the absence of detailed information about actual classroom practices. In Kenya, primary schools continue to report differentials in performance on standardized tests even when policy implementers distribute teachers normally to these schools. Such differences in academic performance have been reported even among schools within the same neighbourhood. Schools from the same neighbourhood draw students with similar backgrounds and expose them to teachers who have gone through the same training. This paper hypothesizes that teaching style plays a key role in explaining the differences in academic performance among students between primary schools. Using data from 72 math lessons that were filmed in 72 primary schools in Kenya, the authors demonstrate the extent to which teaching practice explains differences in performance among students and schools. While controlling for individual and school based factors, the paper uses mixed methods to analyse the linkages between teaching practices and learning achievement. The main research finding and policy implication is that students learning achievement can be improved through quality teaching, even when other conditions such as class size are not conducive.

1. Introduction

Two of the most difficult challenges faced by education researchers and policy makers in Africa concern the issues of how to successfully implement equity and quality policies in a manner that they are complementary, and of how to establish quality education. One cannot talk of quality education without examining teaching and learning processes. Classroom interaction is therefore at the heart of quality education. Furthermore, as pointed out in literature on quality education, efforts to expand enrolment must also be accompanied by attempts to improve educational quality, if children are to achieve meaningful learning outcomes (Alexander, 2007; Vegas and Petrow, 2008).

Information on what happens in classrooms is important in understanding education outcomes such as student achievement and their relationships to quality indicators. However, there exists no consensus on what types of education reforms work best to improve educational quality; and moreover there is no consensus on which teaching styles (also referred in here as practices) are most effective in developing countries. Chesterfield (1997) identifies two main reasons that may explain this lack of consensus. First, research on educational development at the international level has tended to focus more on issues of access than of quality. Such a focus has marginalized issues of quality in relation to the processes of teaching and learning, and of the quality of student's experience in the classroom. Second, studies that focus on schools have attempted to answer questions that are highly generalized, though important. For example, pupil performance measures have been used to establish whether an education reform, programme, project and/or intervention works, but this approach typically fails to explain the transmission (process) mechanism between an education reform and the performance measures used to examine its success. It is therefore important for research in education to fill this information gap by incorporating studies of individual classrooms and students into the research agenda, particularly in Africa, where quality of education is of

* Corresponding author.
E-mail addresses: mngware@aphrc.org (M.W. Ngware), m.oketch@ioe.ac.uk, moketch@aphrc.org (M. Oketch), mmutisya@aphrc.org (M. Mutisya).

0738-0593/$ – see front matter © 2014 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ijedudev.2014.01.004

major concern. This paper attempts this by examining teaching practices at classroom level and relating these to student scores on a curriculum-based test. The purpose of this paper is therefore to identify '*best teaching practices*' that explain learner achievement in low and high performing primary schools in the period following the introduction of free primary education in Kenya.

The quality of instructional delivery is one key variable in the quality of education. According to Stevens (1996), quality of instructional delivery determines the extent to which teaching practices have an impact on students' academic achievement. Stevens argue that teachers should have a cognitive command of the subject being taught and should monitor learners' performance to ensure a coherent implementation of a lesson. A coherent lesson involves proper lesson planning that includes SMART lesson objectives that are identified in advance, learning tasks and activities that match the lesson objectives (Alkin et al., 1990, and Stigler, 1992 in Stevens, 1996; Mohidin et al., 2009). To investigate the extent to which instructional delivery is associated with learning achievement as measured by raw test scores, we hypothesize that teaching practice explains test scores. There exist other factors that either relates directly with teaching practice and/or directly with learner scores. For instance, teacher's mathematical knowledge may influence how a teacher delivers a lesson and at the same time determine how much mathematical knowledge is passed on to the pupils.

Hattie (2009) synthesized over 800 meta-analyses on what influences learning achievement. He concludes that the major contributors to learning include the expectations, level of engagement, knowledge, experiences brought by the student in to the classroom; the home environment that includes parental expectations and use of school language at home; the school environment as indicted by school friendliness and peer influences; the teacher's conception of teaching and quality of teaching; teaching approaches; and, the depth and scope of the curricula. According to Hattie (2009), the average effects to learning of each of these contributors range from 0.3 to 0.5; with the influences of the teacher (0.49), curricula programme (0.45) and the teaching (0.42) they are exposed to having higher average effects. Classroom interactions that best aid student learning are often complex processes that hinge on much interpersonal and pedagogical awareness. The teacher's pedagogy, classroom management strategies and interactions with students at classroom level play a powerful role in determining how much is learned (Hattie, 2009; Morrison et al., 2005).

Converging evidence points to at least three important dimensions of teaching that influence students' learning: the classroom environment that teachers create; teacher warmth and responsiveness to their students and the amount and type of instruction they provide (Hattie, 2009; Morrison et al., 2005). In a classroom situation, teaching should be visible to students while learning should be visible to the teacher (Hattie, 2009). Hattie further argues that the more the student becomes the 'teacher' and the teacher becomes the 'student' the better the learning achievement. Hattie argues that what works well for students also work well for teachers. According to Wenglinsky (2000), developing higher-order thinking skills leads to improved student performance and supports the effectiveness of individualizing instruction to accommodate the differing knowledge and skills that students bring to the classroom. For instance, in Nigeria, Hardman et al. (2008) found that teacher questions were the most frequent teacher elicitation move. Thought provoking, open-ended questions, eliciting a range of responses were rare, with pupil to teacher questions making up less than 1% of the total initiation moves. Math, English and Science lessons were characterized by choral responses (62%) compared to individual responses (35%), with boys being twice as likely as girls to be asked to answer a question by the teacher.

Similar findings have been reported elsewhere in Sub Sahara Africa. In Lesotho, Moloi et al. (2008), observe that although the Free Primary Education programme in Lesotho has enabled nearly all children to attend primary school, poor pedagogical skills among teachers inhibit learning. For example, they found that very little time was spent on oral work in mathematics, with learners only being expected to repeat what the teacher had said. Lack of teaching aids was found to be a problem in many of the primary schools, with teachers exhibiting poor knowledge of maths content and pedagogy (Moloi et al., 2008). In Tanzania, O-saki and Agu (2002) examined the interactions of children within instructional and extracurricular activities in primary schools. The study found that teachers stood in front of the class and led pupils through expositions heavily punctuated with questions that required recall of facts. The pupils' main learning method was to answer the teacher's questions individually or in chorus with up to eight questions being asked to a boy for every question asked to a girl.

Akyeampong et al. (2006) sought to understand better how some teachers felt and thought about their respective classroom roles and to understand their knowledge on teaching styles with respect to policies intended to improve teaching practice in Ghana. Teachers perceived supervision of pupil's work as an interactive process. This process involved going round the classroom, observing pupils' work and intervening as necessary for individualized problem solving. In South Africa, a study in 40 schools by Carnoy et al. (2008) showed that the school system is characterized by a low average level of pupil and teacher mathematical knowledge. In this study most of the maths teachers who were observed demonstrated good pedagogical practice in the way they handled their lessons and with respect to use of lesson time and communication with the students. However a lack of an adequate pool of teacher knowledge of mathematics and pedagogy was found to be a major factor in influencing how much mathematics the students that were observed learned.

Ackers and Hardman (2001) studied classroom interactions in Kenyan primary schools as part of a national baseline study designed to provide a comprehensive picture of the quality of primary education; in order to inform prioritization of expenditure on resources. The study found that in all the 90 lessons observed in Maths, English and Science, teacher recitation in the form of interrogation of the pupils' knowledge and understanding was the most common form of teacher–pupil interaction. In contrast to the domination of teacher questions, pupil-generated questions were very rare despite the evidence that such a strategy promotes higher order thinking and higher learning outcomes. Teacher presentation and teacher-directed question-and-answer dominated most of the classroom discourse, accounting for 82% of total teaching exchanges (Ackers and Hardman, 2001). Pontefract and Hardman (2005) explored the role of classroom discourse in supporting children's learning in Kenyan primary schools. The practice of asking children to complete a sentence either through a direct repetition of the teacher's answer or through the teacher omitting the final word, or words, or a combination of both these strategies, was very common, particularly among younger children. In math lessons, 54% of all pupil responses were choral. The study concluded that there is a dominance of teacher-led recitation in which rote and repetition dominated the classroom discourse with little attention being paid to securing pupil understanding.

Hardman et al. (2009) evaluated the impact of a school-based teacher development programme on learning and teaching that involved a self-study programme using distance learning modules and regular face-to-face cluster meetings between a group of participating teachers and education officers who served as facilitators. Using a mixed-method approach, Hardman et al.