

Review article

Evidence-based teaching: effective teaching practices in primary school classrooms

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Abstract

Understanding and measuring effective teaching practices in low- and middle-income countries is a complex process that requires a contextualised knowledge of teaching quality, as well as adaptable instruments that can reliably capture teachers' varied classroom behaviours. One approach developed with these purposes in mind is Teach Primary, a classroom observation framework designed and revised in 2021 by the World Bank. This framework captures the time teachers spend on learning and the quality of teaching practices which help to enhance pupils' cognitive and socio-emotional skills, as well as aspects of the physical environment which may influence teaching quality. Using the Teach Primary framework, this article examines evidence regarding effective

instructional practices in primary school classrooms, with highlighted examples from low- and middle-income countries. It also sheds light on the criticality of instrument contextualisation, given variations in how practices can be valued and implemented in different settings and how structural quality factors can influence teachers' use of strategies. Challenges and limitations relating to the use of the Teach Primary framework are discussed, along with implications for teacher education and evaluation.

Keywords classroom observation; teaching quality; Global South low- and middle-income countries; teacher effectiveness; primary education; teacher training; instructional teaching practices

Introduction

Since the early 2000s, school enrolment has been rising exponentially in low- and middle-income countries (LMICs). This development has been heavily influenced by United Nations Sustainable Development Goal 4 and the target of achieving universal primary and secondary education (UNESCO Institute of Statistics, 2019). Access to schooling, however, does not always guarantee learning. A significant proportion of children complete primary school without having attained even basic literacy and numeracy skills – a situation referred to as the global learning crisis (UNESCO, 2013). Prior to the Covid-19 pandemic, the Learning Poverty rate in LMICs was 53 per cent. In other words, over half of all 10-year-olds could not read or comprehend a simple text. The Covid-19 crisis has only exacerbated the learning crisis, bringing about a crisis within a crisis, whose impacts on human capital will likely endure (World Bank, 2021a).

The challenges experienced as a result of the pandemic, in addition to the global learning crisis under way before the pandemic, necessitate strengthening teachers' capacities to teach well and meet the evolving challenges that educational systems face today. As we work towards recovering from learning losses, supporting teachers and high-quality teaching has never been more critical, so that students and schools can recover as quickly and effectively as possible.

While access to high-quality professional development opportunities is critical to the improvement of teachers' instructional practice, and is a core aspect of effective teacher policies, evidence has shown that many teachers around the world lack access to these opportunities (Popova et al., 2022). A first step to addressing this issue is having reliable and valid data on current teaching practices, so that these insights can inform and shape the content and focus of teacher professional development programmes and policies. Data on current teaching practices are particularly important, because research has shown that a key driver of educational quality is the quality of teacher–student interactions in the classroom, also known as process quality (Curby et al., 2013; Muijs et al., 2014; Wolf et al., 2018). However, most education systems in LMICs currently fail to regularly monitor the quality of teacher–student interactions, and even where attempts are made, most tools applied fall short (Ladics et al., 2018).

Understanding and measuring the quality of teacher–student interactions is not a straightforward process, given the complexity of what teachers bring to and do in their classrooms, and how different factors can interact to influence students' outcomes (Blömeke et al., 2022; Goe et al., 2008). Although research has shown that teaching practices are the most central factor influencing student outcomes, what happens in a classroom to produce these is often described as a black box (Baloyi, 2021). While a multifaceted approach utilising varied approaches (for example, teacher knowledge assessment, value-added student outcomes and teacher self-reports) is often advised when attempting to monitor and evaluate teaching, given its complexity, classroom observation is frequently the more heavily emphasised component in this process. For example, of the 29 evaluation systems reviewed in the OECD Review on Evaluation and Assessment Frameworks for Improving School Outcomes, almost all used classroom observation (Martinez et al., 2016). Within many LMICs, observations are also often considered the most important aspect of the teacher evaluation process (Bruns et al., 2016; CDE, 2015).

A number of observation tools have been used in developed countries; however, to date, few have been designed with these specific settings in mind (Bruns et al., 2016). One example is the World

Bank's Teach Primary classroom observation framework, which was developed in 2019 as an open-access tool with the goal of helping countries measure the quality of teaching practices to inform policies and improve professional development programmes. The instrument can and has been applied for different purposes, including as a system diagnostic, a monitoring and evaluation tool to assess results from an educational intervention or policy, and as part of a teacher professional development system. Past Teach Primary implementations have been led by organisations, such as J-PAL, IRC, Save the Children and Education World Trust, in addition to the World Bank and by individual schools. Implementations have also varied in terms of their level of integration with existing structures in the education system (World Bank, 2021b).

Teach Primary measures the quality of teacher–pupil interactions, focusing on techniques and behaviours known to nurture children's cognitive and socio-emotional skills. The tool achieves this via an organising framework that captures aspects of both process and structural quality. In respect to process quality, the framework has two main components: Time on Task and Quality of Teacher Practices. The latter has three primary areas for evaluating the quality of teacher practices: Classroom Culture, Instruction and Socio-Emotional Skills. For structural quality, the framework contains a checklist capturing aspects of the classroom environment which have been found to facilitate effective learning for all across LMIC contexts (for example, Carter et al., 2020; Lee and Zuze, 2011).

The question is often raised – to what degree is high-quality instruction universal? To address this issue, Teach Primary applies additional mechanisms to allow for adaptation to local contexts. (For examples of how the tool has been contextualised to specific settings, see World Bank, 2021b.) These include the use of local videos in training and master coding, which enable the elements and behaviours of the instrument to be situated in local contexts. In addition, the tool is modular, which enables users such as governments, schools and researchers to add customised elements and behaviours drawn from the local curriculum and standards, as well as local stakeholder definitions of 'teaching quality' (Ani-Asamoah et al., 2020; World Bank, 2021b).

In this article, we present the Teach Primary framework for describing and measuring the quality of teaching within LMICs. We start by offering an overview of Teach Primary and describing how it is used to measure the time spent on learning and the quality of teaching. Then, we outline the three main areas of effective teaching described by the framework: Classroom Culture, Instruction and Socio-Emotional Skills. Next, for brevity, we analyse the existing theory and research underlying the quality in one of these three areas by focusing on literature related to classroom instruction. We conclude by discussing the key takeaways from presented evidence as well as the limitations relating to the use of the instrument.

We preface the article with a few comments. To start, the Teach Primary framework is not meant to be prescriptive. Rather, it serves as a basis for conversation about teaching quality with educators in LMICs. Further, the review of the literature is intended not only to describe teaching practices that are part of the Teach Primary framework, but also to show the variations that exist in teaching practices across cultures, findings which indicate the importance of instrument contextualisation (Jukes et al., 2021). In addition, we will show how structural quality issues can influence the extent to which teaching practices can be effectively implemented, evidence which underscores the need to consider local realities when utilising frameworks such as Teach Primary. Further, we use examples from a range of contexts, especially from countries within the LMICs, but in some cases, the evidence base supporting practices is still emerging within these settings.

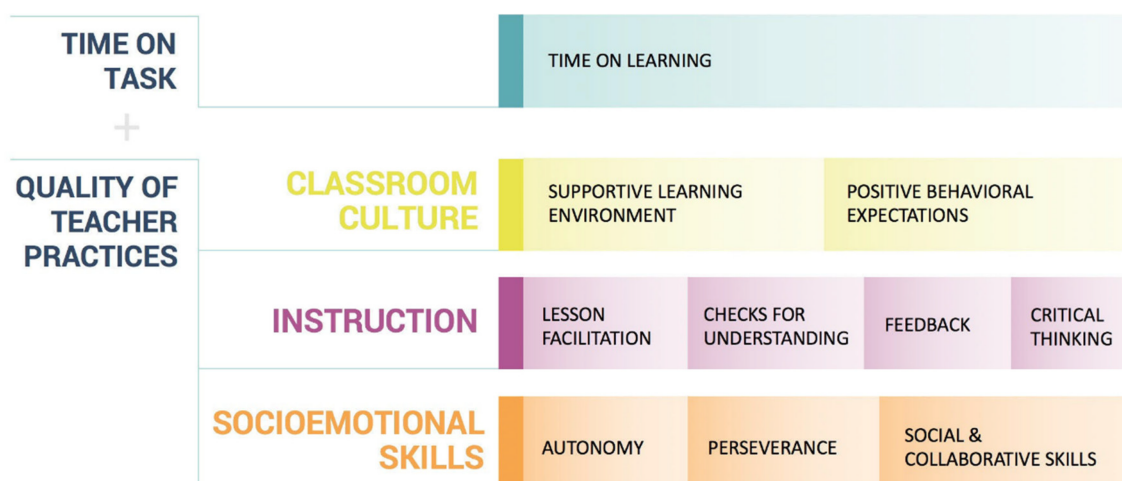
Framework

Over the course of a teacher's lesson, Teach Primary measures the time teachers spend on learning – and the extent to which pupils are on task – and the quality of teaching practices that help to develop pupils' socio-emotional and cognitive skills.

To measure Time on Task, snapshots are utilised to capture teachers' actions and the extent to which pupils are on task throughout the observation. For the Quality of Teacher Practices component, the Teach Primary tool includes three broad areas of teaching practices: Classroom Culture, Instruction and Socio-Emotional Skills, along with nine corresponding elements (Figure 1). It should be noted that it is impossible to draw a clear line between teacher practices linked to academic versus socio-emotional learning. Many teacher practices included in common professional teaching frameworks do impact pupils' socio-emotional development, although they are usually thought of in terms of academic rather

than socio-emotional learning. Explicitly linking teacher practices with socio-emotional outcomes in measures used for assessment will serve to increase the salience of pupils' socio-emotional skills to teachers, as well as to other stakeholders and policymakers, thus ensuring a focus on both academic and socio-emotional learning in the classroom.

Figure 1. Teach Primary framework (Source: Molina et al., 2021: 8)



The observer characterises indicator behaviours within these elements as low, medium or high, based on the quality of teacher practices observed. These behaviour scores are translated into a 5-point scale that quantifies teaching practices, as captured in a series of two 15-minute lesson observations. These broad areas and elements of Teach Primary are described further below.

Classroom culture

The teacher creates a culture that is conducive to learning. The focus here is not on the teacher correcting pupils' negative behaviours, but rather on the extent to which the teacher creates:

- a supportive learning environment by treating all pupils respectfully, consistently using positive language, responding to pupils' needs, challenging gender and/or disability stereotypes and not exhibiting gender and/or disability bias in the classroom
- positive behavioural expectations by setting clear behavioural expectations, acknowledging positive pupil behaviour and effectively redirecting misbehaviour.

Instruction

The teacher instructs in a way that deepens pupil understanding and encourages critical thinking and analysis. The focus here is not on content-specific methods of instruction, but rather on the extent to which the teacher:

- facilitates the lesson by explicitly articulating lesson objectives that are aligned to the learning activity, clearly explaining content by using multiple forms of representation, connecting the learning activity to other content knowledge and to pupils' daily lives and by modelling the learning activity through enacting or thinking aloud
- does not simply move from one topic to the next, but checks for understanding by using questions, prompts or other strategies to determine pupils' level of understanding, by monitoring pupils during group and independent work and by adjusting their teaching to the level of pupils
- gives feedback by providing specific comments or prompts to help clarify pupils' misunderstandings or to identify their successes

- encourages pupils to think critically by asking open-ended questions and providing them with thinking tasks that require them to actively analyse content. Pupils exhibit critical thinking ability by asking open-ended questions or performing thinking tasks.

Socio-emotional skills

The teacher fosters socio-emotional skills that encourage pupils to succeed both inside and outside the classroom. To develop pupils' socio-emotional skills, the teacher:

- instils autonomy by providing pupils with opportunities to make choices and take on meaningful roles in the classroom – pupils exhibit their autonomy by volunteering to participate in classroom activities
- promotes perseverance by acknowledging pupils' efforts, rather than focusing solely on their intelligence or natural abilities, by having a positive attitude towards pupils' challenges by framing failure and frustrations as part of the learning process and by encouraging pupils to set short- and long-term goals
- fosters social and collaborative skills by encouraging collaboration through peer interaction and by promoting interpersonal skills such as perspective taking, empathising, emotion regulation and social problem solving. Pupils exhibit social and collaborative skills by collaborating with one another through peer interaction.

Prior to its launch in 2019, Teach Primary underwent a rigorous development and validation process over a two-year time frame. A technical advisory panel provided extensive feedback and inputs on the tool's design. (The technical advisory panel which provided guidance to the team for the development of the first edition of the tool was composed of Lindsay Brown, Pam Grossman, Heather Hill, Andrew Ho, Sara Rimm-Kaufman, Andrew Ragatz, Erica Woolway and Nick Yoder. For more on the development of the first edition of the tool, see Molina et al., 2021: 9–10) The tool was piloted in over 1,000 classrooms across Mozambique, Pakistan, the Philippines and Uruguay. It was also tested with global video footage from 11 LMICs. Since its launch, Teach Primary, which adapts to each country's context and needs, has been used to support the way countries track and improve teaching practices. As of December 2021, we estimate that Teach Primary has been or is being implemented in over 42,500 schools worldwide, involving almost 180,000 teachers, more than 3.6 million students and 25 organisations. This cycle of observation and feedback has yielded a 20 per cent rise in average teaching scores as tracked by classroom observations across a period of two years (World Bank, 2021b). This has been computed using administrative data provided by the Punjab Programme Monitoring and Implementation Unit, through the Punjab Integrated Education Dashboard and the AEO Classroom Observation Tool Dashboard (for more information on the use of the modified Teach Primary tool in Punjab and Pakistan, as well as in other contexts, please see World Bank, 2021b).

Teach Primary underwent an important revision process in 2020–21 to strengthen the way it was capturing inclusive teaching practices. As part of this process, an inclusion advisory panel of experts in inclusive education provided feedback on the tool, and the revised tool was validated using a library of global videos. (The inclusion advisory panel that guided the team in the development of the second edition of the tool was composed of Jo Westbrook [Senior Lecturer in Education, University of Sussex], Rabea Malik [CEO and Research Fellow, IDEAS Pakistan] and Joshua Josa [Quality, Equity and Sustainability Team Lead, USAID]. Professor Nidhi Singal from the Research and Equitable Access of Learning Centre at the University of Cambridge also supported the development of the tool.) These changes are reflected in the second edition of the Teach Primary tool (Molina et al., 2021), which is presented in this article, together with user feedback from the first two years of using the tool in the field.

Understanding the primary school classroom: a multifaceted environment

Primary school is a foundational stage during which children officially embark on their educational journey. The primary school years are important for children's cognitive, emotional and social development. During these years, children undergo physical and cognitive changes, acquire new social roles outside their family context and start forming their identity (Darling-Hammond et al., 2020; Eccles, 1999). The curriculum in the early years focuses on foundational skills that are considered important by the cultural context, such as literacy and numeracy, gradually expanding to incorporate more complex

subject matter (for example, history and geography) as students' cognitive abilities advance. Pedagogy and teaching are often dictated by the affordances of the respective educational systems. For instance, South African primary school teachers working in rural schools use whole-class instruction for literacy and mathematics lessons to accommodate overcrowded classes (Mabasa-Manganyi, 2023). Mathematics teachers in public primary schools in India have students assess their own work; they do not engage in detailed marking due to the large class sizes (Rao et al., 2013).

The primary classroom is characterised by its vibrant and nurturing atmosphere, aiming to cultivate a love for learning while laying the groundwork for future academic pursuits. Educators in the primary phase are tasked with fostering a positive and inclusive learning environment, adapting teaching strategies to accommodate diverse learning styles and establishing strong teacher–pupil relationships. Across different contexts, primary educators not only manage the class and teach most of the subjects, but also support children's socio-emotional development (OECD, 2018). Primary school teachers have to accommodate children entering with varying levels of cognitive, socio-emotional skills, and with varying levels of readiness that may be influenced by the duration and quality of preschool education they engaged in (Polat and Yavuz, 2016). Teachers must skilfully navigate these differences, adapting their instructional strategies to meet the diverse needs of their primary school pupils. Teachers vary in how they approach the task of educating primary school pupils. Engaging in productive instructional practices is essential for developing learners. For this reason, we turn our attention to the four elements of Teach Primary that describe the teaching practices that are universal across cultures and have been shown to improve learning. For each element, we describe existing evidence linking the teaching practice to student outcomes.

Evidence instruction

In Teach Primary, instruction encompasses four elements of effective teaching: Lesson Facilitation, Checks for Understanding, Feedback and Critical Thinking. See Table 1 for a full definition of each element.

Table 1. Definition of the Teach Primary instructional teaching practices and behavioural indicators of quality

Teach Primary element	Behavioural indicators of quality
Lesson Facilitation refers to the extent to which the teacher is effective at facilitating the lesson to promote pupil comprehension. The teacher facilitates the lesson to promote comprehension by explicitly articulating the objectives, explains the content using multiple forms of representation and connects the lesson with other content knowledge or pupils' experiences.	<ol style="list-style-type: none"> 1. The teacher explicitly articulates the objectives of the lesson and relates classroom activities to the objectives. 2. The teacher explains content using multiple forms of representation. 3. The teacher makes connections in the lesson that relate to other content knowledge or to pupils' daily lives. 4. The teacher models by enacting or thinking aloud.
Checks for Understanding refers to the extent to which the teacher checks for understanding for most pupils. The teacher checks for understanding to ensure most pupils comprehend the lesson content. The teacher also adjusts the pace of the lesson to provide pupils with additional learning opportunities.	<ol style="list-style-type: none"> 1. The teacher uses questions, prompts or other strategies to determine pupils' level of understanding. 2. The teacher monitors most pupils during independent and group work. 3. The teacher adjusts teaching to pupils' level.
Feedback is measured as the degree to which the teacher provides feedback to deepen pupil understanding. The teacher provides specific comments or prompts to help identify misunderstandings, understand successes and guide thought processes to promote learning.	<ol style="list-style-type: none"> 1. The teacher provides specific comments or prompts that help clarify pupils' misunderstandings. 2. The teacher provides specific comments or prompts that help identify pupils' successes.
Critical Thinking refers to the degree to which the teacher builds pupils' critical thinking skills. Specifically, the teacher builds pupils' critical thinking skills by encouraging them to analyse content actively.	<ol style="list-style-type: none"> 1. The teacher asks open-ended questions. 2. The teacher provides thinking tasks. 3. The student asks open-ended questions or performs thinking tasks.

Lesson facilitation

The strategies that teachers apply in their lessons to facilitate learning and comprehension can strongly impact not only student achievement, but also their engagement in and motivation for learning. One key example is the establishment of clear lesson objectives that have been associated with students' more effective use of class time, improved focus and understanding of what is expected during a lesson and increased academic performance (Dunlosky et al., 2013; OECD, 2017; Shield and Dole, 2013). For students with disabilities or learning difficulties, setting clear learning objectives is further considered to be a key indicator of effective pedagogy, due to their particular need for clarity about the direction of a lesson and its requirements. According to Konrad et al. (2014), effective learning goals that can meet all students' needs should be specific, measurable, attainable, relevant and timely to determine whether the expected learning has occurred, and to allow adjustment in instruction if necessary. While the establishment of lesson objectives has been an encouraged practice across international contexts, including within LMICs, it is also important to highlight literature pointing to the detrimental effects of this practice on student agency, motivation and creativity in the classroom when student involvement does not occur. For example, research from Gambia has suggested that when teachers decide the goals of lessons, students' confidence, cooperation and enthusiasm can be negatively impacted, compared to when they can negotiate lesson objectives and related activities with teachers (Guadalupe and Curtner-Smith, 2020). Other issues concerning the use of learning objectives have related to the use of single and prescriptive examples in classrooms that fail to differentiate according to students' varied abilities and interests (Reed, 2012) and that utilise language which 'pre-empts results' and hinders students from discovering relationships between concepts independently (Ministry of Education Ethiopia, 2009: 38). Westbrook et al.'s (2013) review revealing the extent of multi-age and multilingual classrooms in low-income countries has also suggested the need for objectives to be more reflective of student diversity.

Teachers' ability to explain concepts clearly to students through the use of multiple forms of representation has been found to promote learning engagement and academic achievement for students with diverse backgrounds, ability levels and learning preferences across multiple levels of schooling (Capp, 2017; Hattie, 2009). As stated by Capp (2017: 792), 'By representing knowledge in multiple ways, teachers reduce barriers to create classrooms that are accessible for all learners.' A number of studies have shown, for example, that visual information can be easier for students to encode and understand (that is, due to the lower cognitive load), especially when learning about complex concepts. Visual information can help to complement teaching that utilises spoken and/or written forms of representation (for example, Klingner et al., 2011; Woolley, 2010). Another study, conducted in Namibia, revealed how students' understanding of fractions was deepened when visual models (for example, circle area, bar area and number line) were used to complement text and verbal based teacher instruction (Albin and Brown, 2019). Additionally, while the use of audiovisual resources has also been associated with enhanced learning in varied primary school settings, the challenges that many teachers, especially those from low-income countries, experience in attaining access to these supports, and the training that equips them with the skills to use these resources effectively, has been widely acknowledged (for example, Umuhoza and Uworwabayeho, 2021). Related to these challenges, initiatives have been established in LMIC settings which encourage teachers to use locally available resources for enhancing teaching in learning. In the context of Malawi, this includes a pedagogical approach known as TALULAR (Teaching and Learning Using Locally Available Resources), which encourages teachers to use concrete materials around them, such as seeds, leaves and bottle caps, to facilitate learning of content. Emerging research in this area also indicates enhanced learning as a result of these initiatives (for example, Blanks, 2014).

Drawing on students' prior knowledge and experiences of the world, pointing out connections between known and new information can help students make sense of new information (NASEM, 2018; Vosniadou, 2009). Effective teachers make lesson content relevant to students by bringing in examples from their daily lives, a process that enhances learning outcomes and promotes students' motivation, problem-solving abilities and perseverance (Trung et al., 2020). For example, research conducted in multilingual learning contexts in Tanzania has indicated the effectiveness of drawing on real-life examples for enhancing meaningful learning in science where some students may struggle with the language of instruction. This was demonstrated when teachers drew on examples from their local contexts to support

students' comprehension of topics taught, such as pollution, through having students observe examples of pollutant materials outside their classroom setting in their local surroundings (Mkimbili, 2019).

Modelling is another instructional strategy that has been shown to be particularly successful at promoting student learning gains (Purdiyanto et al., 2021), motivation (Moussa and Koester, 2021) and self-regulation (Schunk and Zimmerman, 2007), which are central to students' learning process (Checa et al., 2008). Westbrook et al.'s (2013) rigorous literature review of pedagogic practices that best support all students learning at both primary and secondary levels in low-income countries, for example, identified demonstration as a key teaching strategy associated with positive student outcomes. Moreover, Hattie (2009) synthesised over 800 meta-analytic studies of various designs and found that learning activities where the teacher is actively involved with the lesson (for example, working through the problem step by step with the students) are particularly effective at promoting learning gains in students, compared with activities where the teacher is less involved (for example, the teacher instructing students to complete a problem sheet independently). Research from Nigeria has also pointed to the positive impacts that teacher modelling of reading aloud can have on primary pupils' listening comprehension, letter sound recognition, non-word decoding and reading fluency, along with their motivation to read (Moussa and Koester, 2021). Further, by thinking aloud and walking students through thought processes, they will then be able to take a similar approach to solving similar problems on their own. The think-aloud strategy helps the learner understand what the text really means and provides them with strategies that can be used to answer comprehension questions (Duke and Pearson, 2009; Ortlieb and Norris, 2012). While teacher modelling has been linked to a number of positive student outcomes, teachers' overreliance on this method has also been found to limit opportunities for student active engagement in the classroom and practical application of their learning (Akyeampong et al., 2013; Ngware et al., 2014). For example, a study from Kenya found that teacher-led demonstration accounted for more than 30 per cent of lesson time in mathematics and of science primary school lessons, with a key conclusion being the need for a greater balance between teacher- and pupil-led activity and, relatedly, more teacher training in learner-centred styles that support active application and production of knowledge (Ngware et al., 2014).

Checks for understanding

Broadly speaking, sociocultural theory (Vygotsky, 1978) establishes that learning culturally specific knowledge occurs when youth receive scaffolding (that is, support and guidance) from an adult or more knowledgeable peer. Children learn and develop most effectively when the difficulty of work lies somewhere between what they can do independently and what they can do with assistance (often called the zone of proximal development). For this reason, teaching practices that check for understanding are essential for teachers to know what children know and do not know, so they can adapt the content to children's current level of knowledge. Engaging in this practice effectively is challenging because of the wide variety of knowledge among children in a single classroom. Further, teachers have been shown to assume that primary school pupils have accurate knowledge of concepts, when that is not necessarily the case (Yang et al., 2013).

Asking students questions (often called 'checks for understanding') to determine their level of knowledge is a type of formative assessment that supports learning. It has been identified as a critical component of instruction (Kirschner and Hendrick, 2020). For example, in a study of Indian schools, Aslam and Kingdon (2011) compared mathematics and language teachers on instructional performance, and found positive and large effects of teacher questions and checks on understanding during the lesson on student learning. Although questioning has been identified as a commonly used practice for checking for understanding, research suggests that its understanding and implementation by teachers might be lacking. For instance, a study conducted in primary and secondary classrooms in Ghana showed that teachers' questions typically targeted a few capable students, and that students were rarely given enough time to respond to the teachers' questions (Ampiah, 2008).

Whether students are completing an in-class activity individually or in a group, it is recommended that teachers should monitor what they are doing, rather than wait passively until finished with the activity before they check on students' understanding (Lemov, 2015). For example, Kaendler et al. (2015) suggest that teachers should monitor students on three key dimensions (collaborative, cognitive and metacognitive activity) during group work to ensure effective collaborative learning. Similarly, Rosenshine (2012) found that teachers' facilitation during in-class group-work activities, monitoring

student discussions and interjecting to clarify concepts and increase student engagement, is one of the most important principles of good teaching (Rosenshine, 2012).

Several pieces of research point to the importance of teachers adjusting the level or pace of instruction to promote student achievement. For example, randomised intervention experiments conducted in India have shown that teaching tailored to students' baseline level in mathematics has been found to improve students' overall mathematics scores by half a standard deviation point, with effects lasting a year after programme conclusion (Banerjee et al., 2007). Similar effects of targeting teacher instruction and curriculum to students' initial achievement level were found to be effective for Kenyan children (Duflo et al., 2011), as well as for Ghanaian children, where a study found significant improvements on closing children's achievement gaps in numeracy and literacy skills after an in-school intervention (Duflo and Kiessel, 2017).

Feedback

The use of feedback is considered to be one of the most powerful practices in teachers' toolkits to enhance student learning outcomes (Dean et al., 2012; Hattie, 2009; Wisniewski et al., 2020). High-quality feedback must be specific, task-oriented and provide information to learners on how to proceed (Hattie and Timperley, 2007). However, many studies across different contexts have shown that not all feedback is effective and helpful to learners, and that teachers struggle to provide high-quality feedback (Chafi and Elkhouzai, 2014; Dessie and Sewagegn, 2019; Hattie and Clarke, 2018; Van den Bergh et al., 2013). For instance, a study with Taiwanese upper primary school English teachers (Grade 5) found that in certain cases, teachers used inaccurate language to provide feedback to the pupils, which could have implications for their learning (Ha and Murray, 2023). Moreover, primary and secondary school teachers in Ethiopia struggle to implement active teaching methods, including providing feedback (Ayele et al., 2019).

Hattie et al. (1996) found that students are better able to develop self-regulatory learning skills and detect error in their understanding when teachers create a trusting learning environment where feedback is welcomed. In order for teachers to achieve this, they not only need to detect and highlight errors, as well as respond to them appropriately (that is, never criticising students); they also need to identify how their feedback can be most constructive for students moving forward (Seifried and Wuttke, 2010; Wisniewski et al., 2020). The consensus in the literature is for teachers to avoid using general questions, such as 'How do you do this?', or giving general declarations that do not identify specific aspects of the problem or task that needs improving, as this would only serve to confuse students more (Webb, 2009). Particularly, when a student provides an incorrect answer, the teacher should help the student identify the root of their misconception before moving on to a new topic (Lemov, 2015). Teachers' reaction to students' errors is a well-researched area that has also been found to relate to student success. When students need clarification on content, or have misunderstood a concept, it is important for teachers to address the errors to avoid negative transfer and repeated future misconceptions (National Research Council, 2007).

Just as identifying and clarifying students' misunderstandings is important for learning, effective teachers highlight students' successes to let the students know they are on track. Classic work has shown the importance of teachers systematically offering positive reinforcement to students and building on students' responses to solidify these successes (Brophy and Good, 1986; Partin et al., 2009). More recently, a meta-analysis of 60 studies, including those focused within primary schools in various countries in the Global North and South, showed that elaborate feedback (explaining why an answer is correct) and knowledge-of-correct-response feedback (stating the correct answer) is more effective than knowledge-of-response feedback (yes/no) within the context of reading (Swart et al., 2019). Effective teacher prompts and questions encourage students' growth mindset by helping individual learners identify what success looks like and ways to do even better in the future (Gelman and Raman, 2003).

However, it should be acknowledged that providing high-quality feedback that relates to the learning goals of the lesson is a challenging task for primary school teachers, who are often limited by time constraints, and are unsure whether the feedback they provide meets pupils' needs and is acted upon (Selvaraj et al., 2021).

Critical thinking

Promoting students' critical thinking skills through teachers' classroom instruction can improve students' learning outcomes (Barta et al., 2022; Lorencová et al., 2019), and there are different ways in which a teacher may do this. One particularly effective way is using open-ended questions, which have been found to be associated with student learning and participation in a growing number of studies from widely different contexts (Azigwe et al., 2016; Gill et al., 2016; Grossman et al., 2013; Hamre et al., 2014; Tyler et al., 2010), and which is a well-researched area (Simpson et al., 2014; Walsh and Sattes, 2011, 2016). A seven-country study in sub-Saharan Africa found that less than one third of teachers use a mix of closed- and open-ended questions, with almost no questions that require students to apply what they learn in a different context (Bold et al., 2017). In Afghanistan, 98 per cent of the teachers present the material without providing students with opportunities to apply those concepts, and most of the questions asked from students are either closed-ended or require a short yes/no answer (Molina et al., 2018a). Similar results were found in Tanzania, Punjab, Pakistan and Mindanao, the Philippines (Geven et al., 2018; Molina et al., 2018b; Trako and Molina, 2018), and in a separate 10-country study (Chile, Mexico, Colombia, Ecuador, Venezuela, Peru, Guatemala, Honduras, El Salvador and the Dominican Republic) of teacher behaviours in primary and secondary classrooms (Cáceres et al., 2020).

Teachers can also provide critical thinking tasks that promote deep learning (that is, learning with understanding), rather than surface learning (that is, rote learning) (Biggs, 1987). In Abrami et al.'s (2015) meta-analysis examining the impact of instructional strategies on the development of critical thinking skills and student achievement among primary, secondary, university and graduate/adult students, opportunities for dialogue (for example, discussion) improved outcomes of critical skills acquisition, as did exposure of students to authentic or situated problems, especially when applied to problem-solving and role-playing methods across educational levels. This meta-analysis also found a significant link between critical thinking instruction, outcomes and academic achievement. Whether students engage in self-explanation or higher-order thinking (Dunlosky et al., 2013) is evidence for student learning and knowledge consolidation. Despite research attesting to the effectiveness of these behaviours, a Ghanaian study investigating how input factors, including questioning, were utilised at the classroom level to promote quality education in primary and junior high schools found that minimal time on student questions in lessons was observed (Ampiah, 2008). For example, within 60 primary and secondary rural schools, no instances of students asking questions were found. Results from this study revealed that students were not motivated to ask questions and, in the rare cases that they did, questions were typically lower order. A study from Malaysia also revealed that teachers struggled to promote primary pupils' critical thinking skills through techniques including questioning and problem solving through their predominant use of the direct learning model and lecture method, as well their primary use of textbooks for delivery of content (Sarwanto et al., 2021). These findings underscore the need for greater teacher training on the encouragement of students' critical thinking skills within the classroom.

Discussion

This article focuses on the framework of the Teach Primary classroom observation tool, which has gained traction in LMICs to measure teaching practices, inform policy dialogue and ensure that professional development programmes are driven by, and are responsive to, teachers' needs. The article presents the research literature underlying the Teach Primary framework, with a particular emphasis on the area of instruction. The evidence reviewed in this article shows that, while there are commonalities in what constitutes 'effective teaching practices' across contexts, variations often exist in how behaviours are valued and manifested in different settings (Jukes et al., 2021). Structural elements can also influence the extent to which specific practices can be effectively implemented within a given context. Further, while there was a particular emphasis on drawing on literature from LMICs, the evidence base on effective teaching practices is still emerging in these contexts. This reiterates the importance of treating the framework as a basis, rather than as a prescription, for creating a common language on what effective teaching practices are among stakeholders within a given education system. It also validates the need for the adaptation process built into the implementation of the Teach Primary classroom observation tool.

Aside from providing the foundations for Teach Primary, this evidence, together with other recent contributions (for example, World Bank, 2018), points to the need to improve teacher education to move beyond teacher content knowledge to what teachers need to do in the classroom, focusing on core

teacher practices (Grossman et al., 2009). Despite the growing evidence on effective teacher policies (Beteille and Evans, 2021), few at-scale teacher professional development programmes demonstrate attributes that evidence suggests are effective (Popova et al., 2022). As an evidence-informed, classroom observation tool that has been implemented in a growing number of LMICs, Teach Primary could play a part in teacher professional development reform effort (World Bank, 2021b). It provides stakeholders with a tool for collecting information on teaching practices on a larger scale to inform the development and implementation of teacher professional development programmes. In addition, as mentioned above, if consensus is developed on the validity of the tool within a given context (the creation of the common language), it serves as a way to define the teaching practices that are prioritised (that is, that teachers should be supported to develop) within a given system.

However, as with any other measurement tool, care needs to be taken to ensure proper implementation and use of data. For instance, tool users need to be trained appropriately, with data and reliability checks in place. In addition, classroom observation tools should not be used in isolation from other approaches, such as value-added student outcomes, teacher knowledge assessment and teacher self and peer reports (Martinez et al., 2016). The Teach Primary tool was not designed for high-stakes evaluation of teachers, and it should not be used as such. Finally, if the tool is used within a coaching programme, designers of the programme need to select coaches, ensuring that they have the experience and training necessary to evaluate and then provide feedback to teachers. As a free, open-source tool, it is not possible to put safeguards in place against all potential misuses of the tool.

To conclude, it is important to note the limitations of an ambitious undertaking such as that of attempting to isolate globally relevant teaching practices that can be easily measured by observers in a classroom. First, as alluded to above, the empirical literature on teaching practices is still, in many cases, nascent, especially in LMICs. As more evidence accumulates, we may have a better understanding of what and how to best capture what matters most for student learning. Second, the Teach Primary framework focuses on primary classrooms, and effective teaching practices may vary across education levels (for example, for pre-primary or secondary education). Finally, while teachers will always play an important role in student learning, their role may change, and the practices that matter for student learning may also change. Any classroom observation tool that seeks to capture effective teaching practices needs to be constantly reviewed so as to ensure that it is up to date in a dynamic and evolving field.

Nevertheless, Teach Primary can contribute to global efforts to address the learning crisis by shedding light on what goes on in classrooms around the world, and highlight the importance of providing effective support to teachers so that every student receives the quality education they deserve.

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Declarations and conflicts of interest

Research ethics statement

Not applicable to this article.

Consent for publication statement

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References

- Abrami, P., Bernard, R., Borokhovski, E., Waddington, D., Wade, C.A. and Persson, T. (2015) 'Strategies for teaching students to think critically: A meta-analysis'. *Review of Educational Research*, 85, 275–314. [CrossRef]
- Akyeampong, K., Lussier, K., Pryor, J. and Westbrook, J. (2013) 'Improving teaching and learning of basic maths and reading in Africa: Does teacher preparation count?'. *International Journal of Educational Development*, 33 (3), 272–82. [CrossRef]

- Albin, S. and Brown, B. (2019) 'Developing Namibian Grade 8 learners' conceptions of fractions using visual models'. *African Journal of Research in Mathematics, Science and Technology Education*, 23, 1–13. [CrossRef]
- Ampiah, J. (2008) 'An investigation of provision of quality basic education in Ghana: A case study of selected schools in the Central Region'. *Journal of International Cooperation*, 11 (3), 19–37. [CrossRef]
- Ani-Asamoah, B., Carter, E., Colenbrander, K., Rose, P. and Leonard, P. (2020) *Video Recordings of Classroom Observations: Using the Teach tool in Rwandan secondary schools*. Leaders in Teaching Research and Policy Paper Series. Cambridge: Laterite and the REAL Centre, University of Cambridge.
- Aslam, M. and Kingdon, G. (2011) 'What can teachers do to raise pupil achievement?'. *Economics of Education Review*, 30 (3), 559–74. [CrossRef]
- Ayele, M.A., Woldeyesus, K.M., Aboretugne, M.A., Gobaw, M.K., Wamisho, A.D., Mamie, A.H. and Berhe, G.D. (2019) 'Teachers' classroom teaching practices in Amhara Region and Addis Ababa City, Ethiopia'. *Africa Education Review*, 16 (3), 1–21. [CrossRef]
- Azigwe, J.B., Kyriakides, L., Panayiotou, A. and Creemers, B.P. (2016) 'The impact of effective teaching characteristics in promoting student achievement in Ghana'. *International Journal of Educational Development*, 51, 51–61. [CrossRef]
- Baloyi, H. (2021) 'Equity of access to schools for classroom-based research in South Africa'. *Issues in Educational Research*, 31 (2), 371–86.
- Banerjee, A.V., Cole, S., Duflo, E. and Linden, L. (2007) 'Remedying education: Evidence from two randomized experiments in India'. *The Quarterly Journal of Economics*, 122 (3), 1235–64. [CrossRef]
- Barta, A., Fodor, L.A., Tamas, B. and Szamoskozi, I. (2022) 'The development of students' critical thinking abilities and dispositions through the concept mapping learning method – a meta-analysis'. *Educational Research Review*, 37, 100481. [CrossRef]
- Beteille, T. and Evans, D.K. (2021) *Successful Teachers, Successful Students: Recruiting and supporting society's most crucial profession*. Washington, DC: World Bank.
- Biggs, J.B. (1987) *Student Approaches to Learning and Studying*. Research Monograph. Camberwell, Victoria: Australian Council for Educational Research.
- Blanks, B. (2014) 'Culturally responsive professional development for inclusive education in rural Malawi'. *The Journal of the International Association of Special Education*, 15 (2), 4–11.
- Blömeke, S., Jentsch, A., Ross, N., Kaiser, G. and König, J. (2022) 'Opening up the black box: Teacher competence, instructional quality, and students' learning progress'. *Learning and Instruction*, 79, 101600. [CrossRef]
- Bold, T., Filmer, D., Martin, G., Molina, E., Rockmore, C., Stacy, B., Svensson, J. and Wane, W. (2017) *What Do Teachers Know and Do? Does It Matter? Evidence from primary schools in Africa*. Washington, DC: World Bank.
- Brophy, J. and Good, T.L. (1986) 'Teacher behaviour and student achievement'. In M.C. Wittrock (ed.), *Third Handbook of Research on Teaching*. New York: Macmillan, 376–91.
- Bruns, B., De Gregorio, S. and Taut, S. (2016) *Measures of Effective Teaching in Developing Countries*. Hanoi: Research on Improving Systems of Education (RISE). [CrossRef]
- Cáceres, M., Nussbaum, M. and Ortiz, J. (2020) 'Integrating critical thinking into the classroom: A teacher's perspective'. *Thinking Skills and Creativity*, 37, 100674. [CrossRef]
- Capp, M.J. (2017) 'The effectiveness of universal design for learning: A meta-analysis of literature between 2013 and 2016'. *International Journal of Inclusive Education*, 21 (8), 791–807. [CrossRef]
- Carter, E., Sabates, R., Rose, P. and Akyeampong, K. (2020) 'Sustaining literacy from mother tongue instruction in complementary education into official language of instruction in government schools in Ghana'. *International Journal of Educational Development*, 76, 102195. [CrossRef]
- CDE (Centre for Development and Enterprise) (2015) *Teacher Evaluation: Lessons from other countries by Centre for Development and Enterprise*. Issuu. Accessed 13 January 2024. https://issuu.com/cdesouthafrica/docs/teacher_evaluation_lessons_from_oth.
- Chafi, M.S. and Elkhoulzai, E. (2014) 'Classroom interaction: Investigating the forms and functions of teacher questions in Moroccan primary school'. *International Journal of Innovation and Applied Studies*, 6 (3), 352–61.
- Checa, P., Rodríguez-Bailón, R. and Rueda, M.R. (2008) 'Neurocognitive and temperamental systems of self-regulation and early adolescents' social and academic outcomes'. *Mind, Brain, and Education*, 2 (4), 177–87. [CrossRef]

- Curby, C., Brock, L. and Hamre, B. (2013) 'Teachers' emotional support consistency predicts children's achievement gains and social skills'. *Early Education and Development*, 24 (3), 292–309. [CrossRef]
- Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B. and Osher, D. (2020) 'Implications for educational practice of the science of learning and development'. *Applied Developmental Science*, 24 (2), 97–140. [CrossRef]
- Dean, C.B., Hubbell, E.R., Stone, B.J. and Pitler, H. (2012) *Classroom Instruction that Works: Research-based strategies for increasing student achievement*. Alexandria: Association for Supervision and Curriculum Development.
- Dessie, A.A. and Sewagegn, A.A. (2019) 'Moving beyond a sign of judgment: Primary school teachers' perception and practice of feedback'. *International Journal of Instruction*, 12 (2), 51–66. [CrossRef]
- Duflo, A. and Kiessel, J. (2017) 'Evaluating the Teacher Community Assistant Initiative in Ghana'. Innovations for Poverty Action. Accessed 14 October 2018. <https://www.poverty-action.org/study/evaluating-teacher-community-assistant-initiative-ghana>.
- Duflo, E., Dupas, P. and Kremer, M. (2011) 'Peer effects, teacher incentives, and the impact of tracking: Evidence from a randomized evaluation in Kenya'. *American Economic Review*, 101 (5), 1739–74. [CrossRef]
- Duke, N.K. and Pearson, P.D. (2009) 'Effective practices for developing reading comprehension'. *Journal of Education*, 189 (1–2), 107–22. [CrossRef]
- Dunlosky, J., Rawson, K.A., Marsh, E.J., Nathan, M.J. and Willingham, D.T. (2013) 'Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology'. *Psychological Science in the Public Interest*, 14 (1), 4–58. [CrossRef]
- Eccles, J.S. (1999) 'The development of children ages 6 to 14'. *The Future of Children*, 9 (2), 30–44. [CrossRef]
- Gelman, S.A. and Raman, L. (2003) 'Preschool children use linguistic form class and pragmatic cues to interpret generics'. *Child Development*, 74 (1), 308–25. [CrossRef]
- Geven, S., Batruch, A. and Van de Werfhorst, H. (2018) *Inequality in Teacher Judgements, Expectations and Track Recommendations: A review study*. Amsterdam: University of Amsterdam.
- Gill, B., Shoji, M., Coen, T. and Place, K. (2016) *The Content, Predictive Power, and Potential Bias in Five Widely Used Teacher Observation Instruments*. REL 2017–191. Washington, DC: REL.
- Goe, L., Bell, C. and Little, O. (2008) *Approaches to Evaluating Teacher Effectiveness: A research synthesis*. Washington, DC: National Comprehensive Center for Teacher Quality.
- Grossman, P., Hammerness, K. and McDonald, M. (2009) 'Redefining teaching, re-imagining teacher education'. *Teachers and Teaching*, 15 (2), 273–89. [CrossRef]
- Grossman, P., Loeb, S., Cohen, J. and Wyckoff, J. (2013) 'Measure for measure: The relationship between measures of instructional practice in middle school English language arts and teachers' value-added scores'. *American Journal of Education*, 119 (3), 445–70. [CrossRef]
- Guadalupe, T. and Curtner-Smith, M.D. (2020) "'It's nice to have choices": Influence of purposefully negotiating the curriculum on the students in one mixed-gender middle school class and their teacher'. *Sport, Education and Society*, 25 (8), 904–16. [CrossRef]
- Ha, X.V. and Murray, J.C. (2023) 'Corrective feedback: Beliefs and practices of Vietnamese primary EFL teachers'. *Language Teaching Research*, 27 (1), 137–67. [CrossRef]
- Hamre, B., Hatfield, B., Pianta, R. and Jamil, F. (2014) 'Evidence for general and domain-specific elements of teacher–child interactions: Associations with preschool children's development'. *Child Development*, 85 (3), 1257–74. [CrossRef]
- Hattie, J. (2009) *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.
- Hattie, J., Biggs, J. and Purdie, N. (1996) 'Effects of learning skills interventions on student learning: A meta-analysis'. *Review of Educational Research*, 66 (2), 99–136. [CrossRef]
- Hattie, J. and Clarke, S. (2018) *Visible Learning: Feedback*. New York: Routledge.
- Hattie, J. and Timperley, H. (2007) 'The power of feedback'. *Review of Educational Research*, 77 (1), 81–112. [CrossRef]
- Jukes, M.C.H., Mgonda, N.L., Tibenda, J.J., Gabrieli, P., Jeremiah, G., Betts, K.L., Williams, J. and Bub, K.L. (2021) 'Building an assessment of community-defined social-emotional competencies from the ground up in Tanzania'. *Child Development*, 92 (6), e1095–109. [CrossRef]
- Kaendler, C., Wiedmann, M., Rummel, N. and Spada, H. (2015) 'Teacher competencies for the implementation of collaborative learning in the classroom: A framework and research review'. *Educational Psychology Review*, 27, 505–36. [CrossRef]

- Kirschner, P.A. and Hendrick, C. (2020) *How Learning Happens: Seminal works in educational psychology and what they mean in practice*. London: Routledge.
- Klingner, J., Tversky, B. and Hanrahan, P. (2011) 'Effects of visual and verbal presentation on cognitive load in vigilance, memory, and arithmetic tasks'. *Psychophysiology*, 48 (3), 323–32. [CrossRef]
- Konrad, M., Keeseey, S., Ressa, V.A., Alexeeff, M., Chan, P.E. and Peters, M.T. (2014) 'Setting clear learning targets to guide instruction for all students'. *Intervention in School and Clinic*, 50 (2), 76–85. [CrossRef]
- Ladics, E., Molina, E., Wilichowski, T. and Yarrow, N. (2018) 'The measurement crisis: An assessment of how countries measure classroom practices'. Paper presented at the 2018 Research on Improving Systems of Education (RISE) Annual Conference, Oxford, 22 June.
- Lee, V. and Zuze, T. (2011) 'School resources and academic performance in sub-Saharan Africa'. *Comparative Education Review*, 55 (3), 369–97. [CrossRef]
- Lemov, D. (2015) *Teach Like a Champion 2.0: 62 techniques that put students on the path to college*. New York: Wiley.
- Lorencová, H., Jarošová, E., Avgitidou, S. and Dimitriadou, C. (2019) 'Critical thinking practices in teacher education programmes: A systematic review'. *Studies in Higher Education*, 44 (5), 844–59. [CrossRef]
- Mabasa-Manganyi, R.B. (2023) 'Factors influencing foundation phase rural teachers' understanding and practices in selecting inclusive teaching strategies'. *South African Journal of Childhood Education*, 13 (1), 11. [CrossRef]
- Martinez, F., Taut, S. and Schaaf, K. (2016) 'Classroom observation for evaluating and improving teaching: An international perspective'. *Studies in Educational Evaluation*, 49, 15–29. [CrossRef]
- Ministry of Education Ethiopia. (2009) *Curriculum Framework for Ethiopian Education (KG – Grade 12)*. Accessed 25 February 2024. [https://moe.gov.et/storage/Books/Curriculum%20Framework%20for%20Ethiopian%20Education%20\(KG%20%E2%80%93%20Grade%2012\).pdf](https://moe.gov.et/storage/Books/Curriculum%20Framework%20for%20Ethiopian%20Education%20(KG%20%E2%80%93%20Grade%2012).pdf).
- Mkimbili, S.T. (2019) 'Meaningful science learning by the use of an additional language: A Tanzanian perspective'. *African Journal of Research in Mathematics, Science and Technology Education*, 23 (3), 265–75. [CrossRef]
- Molina, E., Fatima, S.F., Trako, I. and Wilichowski, T.M. (2018a) *Teaching Practices in Philippines*. Policy Paper. Washington, DC: World Bank.
- Molina, E., Pushparatnam, A., Melo Hurtado, C.E., Wilichowski, T.M., Del Toro Mijares, A.T., Ding, E.Y.Z., Aloys, J.B., Carter, E.J. and Singal, N. (2021) *Teach Primary: Observer manual*. Washington, DC: World Bank Group. Accessed 25 February 2024. <https://documents.worldbank.org/curated/en/872291641201520569/Teach-Primary-Observer-Manual>.
- Molina, E., Trako, I., Hosseini Matin, A., Masood, E. and Viollaz, M. (2018b) *The Learning Crisis in Afghanistan*. Policy Paper. Washington, DC: World Bank.
- Moussa, W. and Koester, E. (2021) 'Effects of story read-aloud lessons on literacy development in the early grades: Experimental evidence from Nigeria'. *Reading Research Quarterly*, 57 (2), 587–607. [CrossRef]
- Muijs, D., Kyriakides, K., Van der Werf, G., Creemers, B., Timperley, H. and Earl, L. (2014) 'State of the art – teacher effectiveness and professional learning'. *School Effectiveness and School Improvement*, 25 (2), 231–56. [CrossRef]
- NASEM (National Academies of Sciences, Engineering, and Medicine) (2018) *How People Learn II: Learners, contexts, and cultures*. Washington, DC: The National Academies Press.
- National Research Council. (2007) *Taking Science to School: Learning and teaching science in Grades K–8*. Washington, DC: The National Academies Press.
- Ngware, M., Oketch, M. and Mutisya, M. (2014) 'Does teaching style explain differences in learner achievement in low and high performing schools in Kenya?'. *International Journal of Educational Development*, 36, 3–12. [CrossRef]
- OECD (Organisation for Economic Cooperation and Development) (2017) *PISA 2015 Results (Volume III): Students' well-being*. Paris: OECD Publishing.
- OECD (Organisation for Economic Cooperation and Development) (2018) *How Do Primary and Secondary Teachers Compare? Education Indicators in Focus*, No. 58. Paris: OECD Publishing.
- Ortlieb, E. and Norris, M.R. (2012) 'Preventing the development of struggling readers: Comprehension instruction in the science classroom'. *Current Issues in Education*, 15 (1), 4.

- Partin, T.C.M., Robertson, R.E., Maggin, D.M., Oliver, R.M. and Wehby, J.H. (2009) 'Using teacher praise and opportunities to respond to promote appropriate student behaviour'. *Preventing School Failure: Alternative education for children and youth*, 54 (3), 172–8. [CrossRef]
- Polat, Ö. and Yavuz, E.A. (2016) 'The relationship between the duration of preschool education and primary school readiness'. *Childhood Education*, 92 (5), 396–404. [CrossRef]
- Popova, A., Evans, D., Breeding, M.E. and Arancibia, V. (2022) 'Teacher professional development around the world: The gap between evidence and practice'. *The World Bank Research Observer*, 37 (1), 107–36. [CrossRef]
- Purdiyanto, P., Jambi, S.T., Sasongko, R.N., Kristiawan, M., Walid, A. and Kusumah, R.G. (2021) 'Influence of demonstration methods and student's activity on learning outcomes'. *Education Quarterly Reviews*, 4 (2), 91–9. [CrossRef]
- Rao, N., Pearson, E., Cheng, K.M. and Taplin, M. (2013) *Teaching in Primary Schools in China and India: Contexts of learning*. New York: Routledge.
- Reed, D.K. (2012) 'Clearly communicating the learning objective matters!'. *Middle School Journal*, 43 (5), 16–24. [CrossRef]
- Rosenshine, B. (2012) 'Principles of instruction: Research-based strategies that all teachers should know'. *American Educator*, 36 (1), 12.
- Sarwanto, S., Fajari, L.E.W. and Chumdari, C. (2021) 'Critical thinking skills and their impacts on elementary school students'. *Malaysian Journal of Learning and Instruction*, 18 (2), 161–87. [CrossRef]
- Schunk, D.H. and Zimmerman, B.J. (2007) 'Influencing children's self-efficacy and self-regulation of reading and writing through modeling'. *Reading and Writing Quarterly*, 23 (1), 7–25. [CrossRef]
- Seifried, J. and Wuttke, E. (2010) 'Student errors: How teachers diagnose and respond to them'. *Empirical Research in Vocational Education and Training*, 2 (2), 147–62. [CrossRef]
- Selvaraj, A.M., Azman, H. and Wahj, W. (2021) 'Teachers' feedback practice and students' academic achievement: A systematic literature review'. *International Journal of Learning, Teaching and Educational Research*, 20 (1), 308–22. [CrossRef]
- Shield, M. and Dole, S. (2013) 'Assessing the potential of mathematics textbooks to promote deep learning'. *Educational Studies in Mathematics*, 82 (2), 183–99. [CrossRef]
- Simpson, A., Mokalled, S., Ellenburg, L.A. and Che, S.M. (2014) 'A tool for rethinking teachers' questioning'. *Mathematics Teaching in the Middle School*, 20 (5), 294–302. [CrossRef]
- Swart, E.K., Nielen, T.M. and Sikkema-de Jong, M.T. (2019) 'Supporting learning from text: A meta-analysis on the timing and content of effective feedback'. *Educational Research Review*, 28, 100296. [CrossRef]
- Trako, I. and Molina, E. (2018) *The Learning Crisis in Tanzania*. Working Paper. Washington, DC: World Bank.
- Trung, T., Nguyen, T.T. and Trinh, T.P.T. (2020) 'Mathematics teaching in Vietnam in the context of technological advancement and the need of connecting to the real world'. *International Journal of Learning, Teaching and Educational Research*, 19 (3), 255–75. [CrossRef]
- Tyler, J.H., Taylor, E.S., Kane, T.J. and Wooten, A.L. (2010) 'Using student performance data to identify effective classroom practices'. *American Economic Review*, 100 (2), 256–60. [CrossRef]
- Umuhiza, C. and Uworabayeho, A. (2021) 'Teacher's use of instructional materials in teaching and learning mathematics in Rwandan primary schools'. *African Journal of Teacher Education*, 10 (2), 1–16. [CrossRef]
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2013) *The Global Learning Crisis: Why every child deserves a quality education*. Programme Document. Paris: UNESCO.
- UNESCO Institute of Statistics. (2019) *World Inequality Database on Education*. New York: Taylor & Francis.
- Van den Bergh, L., Ros, A. and Beijaard, D. (2013) 'Teacher feedback during active learning: Current practices in primary schools'. *British Journal of Educational Psychology*, 83 (2), 341–62. [CrossRef] [PubMed]
- Vosniadou, S. (ed.) (2009) *International Handbook of Research on Conceptual Change*. New York: Routledge.
- Vygotsky, L.S. (1978) *Mind in Society: Development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Walsh, J.A. and Sattes, B.D. (2011) *Thinking through Quality Questioning: Deepening student engagement*. Thousand Oaks, CA: Corwin Press.

- Walsh, J.A. and Sattes, B.D. (2016) *Quality Questioning: Research-based practice to engage every learner*. Thousand Oaks, CA: Corwin Press.
- Webb, N.M. (2009) 'The teacher's role in promoting collaborative dialogue in the classroom'. *British Journal of Educational Psychology*, 79 (1), 1–28. [CrossRef] [PubMed]
- Westbrook, J., Durrani, N., Brown, R., Orr, D., Pryor, J., Boddy, J. and Salvi, F. (2013) *Pedagogy, Curriculum, Teaching Practices and Teacher Education in Developing Countries*. Final report. Education Rigorous Literature Review. London: Social Science Research Unit, Institute of Education, University of London.
- Wisniewski, B., Zierer, K. and Hattie, J. (2020) 'The power of feedback revisited: A meta-analysis of educational feedback research'. *Frontiers in Psychology*, 10, 3087. [CrossRef]
- Wolf, S., Raza, M., Kim, S., Aber, J.L., Behrman, J.R. and Seidman, E. (2018) 'Measuring and predicting process quality in Ghanaian pre-primary classrooms using the Teacher Instructional Practices and Processes System (TIPPS)'. *Early Childhood Research Quarterly*, 45, 18–30. [CrossRef]
- Woolley, G. (2010) 'Developing reading comprehension: Combining visual and verbal cognitive processes'. *Australian Journal of Language and Literacy*, 33 (2), 108–25. [CrossRef]
- World Bank (2018) *World Development Report 2018: Learning to realize education's promise*. Washington, DC: World Bank.
- World Bank (2021a) 'World Bank: Pandemic threatens to drive unprecedented number of children into learning poverty'. Press Release, 29 October. Washington, DC: World Bank. Accessed 6 March 2024. <https://www.worldbank.org/en/news/press-release/2021/10/29/world-bank-pandemic-threatens-to-drive-unprecedented-number-of-children-into-learning-poverty>.
- World Bank. (2021b) *Teach in Action: Three case studies of each implementation*. Washington, DC: World Bank.
- Yang, C., Noh, T., Scharmann, L.C. and Kang, S. (2013) 'A study on the elementary school teachers' awareness of students' alternative conceptions about change of states and dissolution'. *The Asia-Pacific Education Researcher*, 23, 683–98. [CrossRef]