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Adapting Pedagogy to Cultural Context

Matthew C. H. Jukes, Yasmin Sitabkhan, and Jovina J. Tibenda

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RTI International
3040 East Cornwallis Road
PO Box 12194
Research Triangle Park, NC
27709-2194 USA

Tel: +1.919.541.6000
E-mail: rtipress@rti.org
Website: www.rti.org

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About the Authors

Matthew Jukes, DPhil, is a Fellow and senior education evaluation specialist in the International Education division at RTI International.

Yasmin Sitabkhan, PhD, is a senior mathematics education researcher in the International Education division at RTI International.

Jovina Tibenda, MA, is Subnational Capacity Building Lead, Jifunze Uelewe program in Tanzania, funded by the US Agency for International Development (USAID) and implemented by RTI International.

RTI Press Associate Editor

Nitya Venkateswaran

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Abstract

This paper argues that many pedagogical reform efforts falter because they fail to consider the cultural context of teacher and student behavior. Little guidance exists on how to adapt teaching practices to be compatible with culturally influenced behaviors and beliefs. We present evidence from three studies conducted as part of a large basic education program in Tanzania showing that some teaching activities are less effective or not well implemented because of culturally influenced behaviors in the classroom, namely children's lack of confidence to speak up in class; a commitment to togetherness, fairness, and cooperation; avoidance of embarrassment; and age-graded authority. We propose ways teaching activities can be adapted to take these behaviors into account while still adhering to fundamental principles of effective learning, including student participation in their own learning, teaching at the right level, and monitoring students as a basis for adjusting instruction. Such adaptations may be made most effective by engaging teachers in co-creation of teaching activities.

Introduction

In this paper, we explore how teaching and learning can be more effective by designing pedagogical approaches with culture in mind. Researchers have observed the mismatch between pedagogical reform efforts and the culture of many low- and middle-income countries (LMICs) for more than 50 years (e.g., Hoyle, 1969). However, there has been little granular analysis of how specific cultural behaviors and beliefs may not be compatible with specific teaching practices. Nor is there much detailed practical advice on how to design pedagogical reform to avoid issues of cultural mismatch. In this paper, we aim to address these gaps by examining less-studied teacher behaviors and beliefs to suggest future directions for both research and practice in global education.

We use the term "culture" to refer to the learned social behavior of a society (Richerson & Boyd, 2005). Other aspects of culture—language and indigenous knowledge—have been considered elsewhere (e.g., McGovern, 1999; Freeland, 1995). We are primarily concerned with the cultural basis of social behavior in general, rather than the specific culture of classroom behavior, although the two are related. That is, the culture of teaching—the practices teachers are familiar with because of their own education and experience—has much of its origin in the way that adults and children interact outside school.

Alexander's (2001) seminal study in five countries sought to understand how the values of societies shape the behavior of teachers and students in the classroom. Building on this theme, Tabulawa (2013) presents a cultural perspective on teaching, which argues that pedagogy is more than the observable techniques of teaching. Conversely, the technical view of teaching sees the teacher implementing "proven" teaching techniques that are universally applicable. It assumes that certain pedagogical approaches have been demonstrated as effective and the teacher's job is simply to carry out these strategies faithfully. However, this approach fails to recognize that teachers have agency and that they make decisions while teaching that are informed by the social and cultural context in which they operate. The neglect of cultural context has led to a preponderance of standardized solutions to problems of teaching and learning.

In this paper, we consider one dimension of the context of teaching: the culturally influenced behavior of students and teachers, particularly the way students and teachers interact with each other. Tabulawa (2013) notes that schools in Botswana mirror Tswana child-rearing practices: the student learns to conform to edicts from authority. Learning is by rote and mistakes are punished. "To be innovative and critical is actively discouraged by the rote learning approach. Spontaneity, creativity, self-reliance, and autonomy are stifled. A good student must show docility, obedience, submissiveness towards his/her teacher" (Tabulawa, 2013, p.103). Attempts to develop creativity and self-expression in students "are shattered both by the Botswanan education system and the responses of most Tswana students who want clear instructions as to what is expected of them and clear standards by which they must perform" (Tabulawa, 2013, p. 103).

This example from Botswana illustrates how classroom instruction can depend on the cultural conditioning of teachers and students more than the content of a new teacher training program or teacher's guide. Tabulawa (2013) and others (O'Sullivan, 2004; Schweisfurth, 2011, 2013) have described how the norms of adult-child interaction in a culture are a major barrier for the adoption of new pedagogical approaches. Tabulawa (2013) cites the evocative metaphor of "tissue rejection" (Hoyle, 1969) to describe the process by which a culture is resistant to new teaching methods.

Many studies of cultural resistance have examined pedagogical reform aimed at promoting "learner-centered education," a term that is used in many ways. Most often it is used to mean everything that is not "rote" learning. In some cases, this means following the child's interests and tailoring learning experiences to children's needs (Katz & Chard, 1992). In other cases, it means creating active learning experiences where children construct their own knowledge, or cooperative group work that is not teacher-led (Vavrus et.al. 2011). Several studies have suggested ways to address the challenge posed by the

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mismatch between learner-centered education and host cultures. O'Sullivan (2004) argues that, rather than follow a set of prescribed "learner-centered" pedagogical approaches, professional development programs should focus on practices that teachers can adopt and that improve student learning. She describes this approach as "*learning*-centered." Schweisfurth (2013) builds on this idea and proposes seven "minimum standards" that such an approach should incorporate, including, for example, engaging and motivating students and building on their existing knowledge. Another approach to the problem of cultural mismatch is to identify commonalities between a pedagogical approach and a host culture. For example, Sakata et al. (2021) analyzes similarities between the official Tanzanian policy of learner-centered pedagogy and the concept of *ujamaa,* which is translated as "familyhood" and embodies the values of equality and self-reliance among communities. Ujamaa was popularized by the country's first president, Julius Nyerere, and remains an influential cultural value in Tanzania today.

These studies represent progress in addressing the need for practical approaches for adapting pedagogy to cultural context. However, there are few instances of granular analyses of classroom practice, to address questions such as: Which culturally influenced behaviors and values are incompatible with which teaching practices? Where there is an incompatibility, what alternate approaches can effectively help children learn?

If effective pedagogies do not align with the ways students and teachers are comfortable behaving, then at least one of these three things needs to change: (1) the teacher, (2) the student, or (3) the pedagogical approach. Notwithstanding the academic literature cited above, our view is that most reform programs implicitly or explicitly ask teachers to adapt to new methods of instruction. Instead, we focus on the overlooked approaches of adapting teaching methods to the teachers and students and—to a lesser extent—working with students to help them engage with different pedagogies.

The first aim of this paper is to give practitioners and policymakers practical suggestions for adapting classroom practices based on an understanding of culturally influenced beliefs and behaviors. The second aim is to outline questions to be addressed in future research. To achieve these aims, we first describe theory and evidence for the influence of culture on human behavior (second section) to frame the subsequent empirical research. In the third section, we describe the Tusome Pamoja program of teacher professional development implemented in Tanzania and an associated series of research studies aiming to investigate culturally influenced behaviors in classrooms supported by Tusome Pamoja. We identified several culturally influenced behaviors, which are depicted in detail in the fourth section, with a focus on how they influence the adoption of new teaching methods. The fifth section describes the theories of learning that underpin effective teaching methods to suggest ways teaching methods can achieve learning goals by building on culturally influenced behaviors of teachers and students (the sixth section). In this penultimate section, we also suggest research questions that will help us understand the issues we discuss in greater depth and develop and test the potential improvements to pedagogy we suggest. Finally, we draw general conclusions.

How Culture Shapes Human Behavior

In this section, we review evidence from anthropology and cultural psychology to understand how the behaviors and values of teachers and students may differ between Tanzania—the subject of this research project—and Western, educated, industrialized, rich, and democratic (WEIRD; Henrich et al., 2010a, 2010b) settings, the origin of many of the pedagogical approaches Tanzanian teachers are required to adopt. Much of the discussion focuses on rural agricultural communities in Tanzania. This is partly because subsistence agriculture remains the dominant form of economic production in the country. In 2007, 76 percent of Tanzanians still relied on agriculture for their livelihood (Cleaver et al., 2010). In addition, the culture and behavior of rural Tanzanians provides the greatest contrast with WEIRD societies and thus helps us map the terrain of potential cultural mismatches.

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A global review of anthropological evidence (Lancy, 2014) concluded that, notwithstanding the uniqueness of every culture, there are commonalities in childhoods that allow for generalizations. According to this review, one type of childhood is common in WEIRD societies with knowledge economies based on commerce, with a large urban population and widespread formal education. In WEIRD societies, it is common for one person to question another, children learn by instruction, their attention is focused and fleeting, intelligence is seen in terms of cognitive alacrity, there is a lot of verbalization and a lot of "why" questions (Martini, 1996), compliance is hard to achieve, and reason is used to change a child's behavior. By contrast, in rural communities based on subsistence agriculture, questioning is rare (Gauvain et al., 2013), children learn by observing and participating with adults, their attention is wide-angled and abiding, intelligence is seen in terms of social responsibility (Serpell, 2011), there is little verbalization, "why" questions are few and do not require a response from adults, children wish to be compliant, and ridicule is used to change a child's behavior.

The commonalities in childhood result from regularities in the modes of economic production, which shape the structure of societies (Greenfield, 2016; Keller, 2016; LeVine et al., 1993). Subsistence agricultural communities are small-scale, such that longstanding social relationships are more important than fleeting encounters with strangers. Agricultural production is predictable and relies more on working toward a communal goal with compliance from family members, rather than the ability to learn new things and adapt. The birthing age is lower in subsistence agricultural communities, giving rise to large multigenerational families. By contrast, knowledge economies require workers with cognitive abilities, education, and a familiarity with technology. Smaller families allow a greater investment in children; these children are consequently engaged in cognitively stimulating conversations and encouraged to express themselves, explore, and be curious.

Global evidence from cultural and developmental psychology (Greenfield, 2016) suggests that the culture, values, and parental practices described above shape children's behavioral development. Children in WEIRD societies demonstrate self-expression, curiosity, independence, and extraversion. They are more likely to choose their gender roles, compete with others, try to stand out and be unique, have more self-esteem, and focus on the self and internal feeling states. By contrast, children in subsistence agricultural societies are respectful, obedient, and shy. They are more likely to have ascribed gender roles, cooperate with others, try to fit in, have less self-esteem, and focus on and empathize with others.

Greenfield's (2016) model also describes the results of demographic change on developmental pathways. As commerce, technology, and formal education (Gauvain & Munroe, 2009) become more widespread, the behaviors associated with these demographic changes become more evident in subsequent generations of children. This relationship between demographics and developmental outcomes is seen over time (Kagitcibasi & Ataca, 2005) and between urban and rural areas of the same country (Jukes et al., 2018c).

As demographics change, some aspects of a culture may endure because they are embodied in the values, practices, and beliefs of the society (see, e.g., Alesina et al., 2013). Thus, individuals or societies may still exhibit much of the subsistence agriculture communities' culture long after they have begun to engage in other modes of production. When we refer to the culture of societies based on subsistence agriculture in this paper, this may include communities without many subsistence farmers at present.

Keller (2016) provides a helpful way to conceptualize the key cultural dimensions that underpin the different behaviors seen between contrasting childhoods described above. She argues that two dimensions guide development pathways: autonomy and relatedness. "Autonomy refers to self-government and responsible control for one's life. Relatedness refers to the social nature of human beings and the connectedness with others" (p. 1). In this view, the WEIRD developmental pathway fosters individuals who are autonomous—independent, self-reliant, and competitive (Markus & Kitayama, 1991). In

WEIRD contexts, human behavior relies on personal preferences and choices. Autonomous individuals choose who they relate to and relationships are seen in terms of how they fulfill autonomously defined goals. By contrast, Keller argues that subsistence agricultural societies foster heteronomy—a hierarchical family unit completes communal tasks that can only be solved through the embodiment of communal goals replacing personal choices. In such a society, relatedness to others is paramount. People in these societies see their identity as being part of a group. There is a preference for group activities and for cooperation.

Keller's (2016) formulation helps us think further about how demographic shifts manifest themselves. She argues that urbanization and education in agricultural societies can have more impact on autonomy than relatedness, such that the middle-class in agricultural societies fit the "autonomous/related" description (Kağitçibaşi, 2017). Members of this middle class are more likely to exercise personal choice than those in villages, but still place great importance on interpersonal relationships. This hybrid middle-class cultural model is useful for guiding discussion in subsequent sections of this paper to the extent that the model applies to teachers. We may find that education, and perhaps some time spent in urban environments, has led to more autonomy and personal choice among teachers, compared with adults and children in the village. However, we would expect teachers and villagers alike to value interpersonal relationships more than in WEIRD societies.

The above discussion focuses on cultural models derived from economic modes of production. We acknowledge many other cultural influences on human behavior, such as philosophies and religion (Inglehart & Baker, 2000). For example, in Tanzania, the philosophy of *ujamaa,* described in the introduction, is influential and reinforces the values of social responsibility and the pursuit of communal goals associated with rural agricultural societies (Sakata et al., 2021). Furthermore, even among cultural models derived from economic modes of production, there is evidence of some differences within the two cultural models described above—for example, between fishermen, foragers, and farmers (Uskul, Kitayama, & Nisbett, 2008) and among the middle classes of different Western countries (e. g., Harkness, Super, & van Tijen, 2000). We focus our discussion on the two cultural models described because they are well-supported by evidence and illustrate the contrast in the behavior of teachers and students between Tanzania (the context of the studies in this paper) and WEIRD contexts (which dominate the literature on pedagogical effectiveness). As such, they are a useful lens through which to view classroom behavior and a starting point for a cultural analysis to which further research can add nuance.

Before discussing how such culturally influenced behavior manifests itself in the classroom, it is worth considering how learning takes place outside the classroom. In subsistence agricultural societies, learning is through participation in chores and other productive activities. Children take part in these activities naturally, motivated by a desire to fit in (Lancy, 2014). Instruction is not a separate, dedicated process designed to prepare children to conduct any activities competently in the future. It takes place informally, as part of the activity. Lave and Wenger (1991) discuss an apprenticeship model of learning using legitimate peripheral participation, where newcomers are given small tasks that are important but not high-risk. The authors studied tailors in Liberia and found that newcomers just starting their tailor apprenticeship were doing small tasks while being mentored. They eventually were given access to more fundamental parts of the practice. Similarly, Chavajay & Rogoff (2002) discuss the role of attention in learning among Mayan children, where observation—rather than direction instruction—was used to learn new skills. Such models of learning are widespread in subsistence agricultural societies around the world. They are a template for successful learning in such societies, which will serve as a reference point for our discussion of culture in the classroom.

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A Program to Implement and Study Pedagogical Reform in Tanzania

This section has two aims. The first is to describe the Tusome Pamoja Program along with the specific teaching activities it promotes and to consider whether the design of these activities has a WEIRD origin. The second is to describe a program of research designed to address gaps in knowledge described in the introduction, namely, to identify specific behaviors and beliefs of teachers and students that have a cultural origin and to understand how they influence the implementation of specific teaching practices under the Tusome Pamoja Program.

The Tusome Pamoja Program of Pedagogical Reform

The Tusome Pamoja Program was funded by the US Agency for International Development (USAID). The program was a 5-year, education sector support program aimed at achieving better learning outcomes in the early grades of primary school across four regions of Mainland Tanzania (Iringa, Morogoro, Mtwara, and Ruvuma) and 11 districts of Zanzibar. A key objective of Tusome Pamoja was to achieve improvement in levels of reading, writing, and mathematics. In the 2018–2019 school year, an estimated 853,150 students across Standards 1 through 4 and 10,600 teachers in 3,043 schools benefited from the program.

We focus here on the literacy component of the program and consider whether its design was WEIRD in origin. The Tusome Pamoja approach to literacy was informed by research-based best practices in early literacy instruction (Bulat et al., 2017). These best practices included a balanced approach to literacy, focusing on explicit instruction in the skills students need to read, as well as multiple opportunities to use these skills to read and write (Pressley & Allington, 2015). The training and materials used the gradual release of responsibility instructional model (made accessible for teachers through the "I do, We do, You do" model), which allows for direct, explicit instruction in core reading skills such as phonological awareness (Fisher & Frey, 2008; Pearson & Gallagher, 1983). A similar approach has been used in many donor-funded reading programs in LMICs with evidence of a modest impact on children's learning outcomes (Stern & Piper, 2019). However, the approach was based on research and evidence from WEIRD countries, and the effectiveness of specific teaching activities has not been evaluated in other contexts. Some teacher activities may not be compatible with the culturally influenced behavior of teachers and students.

In the program, teaching practices were promoted initially through workshops with teachers and later through communities of learning, which are school-based meetings where teachers reflect on their practice. When possible, ward education officers, who are responsible for three to six schools, facilitate communities of learning. Much of the training focused on use of a "Decodable Instructional Tool" that contained detailed guidance on how to conduct lessons. Overall, teachers were encouraged to include the following in their classroom practice:

- Making a lesson plan
- Using the Decodable Instructional Tool (Mainland Tanzania) or Teachers' Guide (Zanzibar)
- Employing the "I do, we do, you do" gradual release model
- Checking for student understanding
- Monitoring and supporting students in the class
- Organizing seating arrangements in the class to promote learning
- Conducting group work
- Distributing questions throughout the classroom rather than focusing on high-achieving pupils
- Conducting various reading activities, including individually and in pairs
- Responding with encouragement and feedback to students' contributions
- Asking open-ended questions
- Using a variety of materials

Tusome Pamoja Research Studies

Our aim in the Tusome Pamoja research studies was to describe how culturally influenced behaviors and beliefs influence the implementation of specific teaching practices. In Study 1, we aimed to understand cultural values and beliefs through

an exploration of children's competencies valued by local communities. The findings of this study, combined with literature on culture and human behavior described previously, informed hypotheses for Study 2 regarding how culture influences teaching practices. In Study 2, we observed teachers' practices, explored our hypotheses, and identified new hypotheses through interviews with teachers about the practices we observed. In Study 3, we interviewed teachers about hypothetical scenarios designed to explore our hypotheses further. We now describe each study in more detail.

Study 1 (Jukes et al., 2018, 2021) took place in the Mtwara region of Mainland Tanzania and examined local perceptions of the competencies that children require for success in both school and life in general. The first phase of the study involved interviewing parents, teachers, and students to understand which competencies they valued most. The second phase involved developing an instrument to assess teacher and parent ratings of students on the competencies identified in the first phase of the study.

Study 2 took place in three geographic areas: in the Mtwara and Iringa regions of Mainland Tanzania and in Zanzibar (Jukes et al., 2019). In this study, researchers observed one literacy lesson conducted by each of the 36 Class 2 teachers—12 in each of the three areas. Observers recorded occurrences of teaching practices promoted by Tusome Pamoja (listed in the previous section) and then interviewed teachers about their pedagogical choices, asking them why they conducted certain activities and did not conduct others. In addition to these qualitative interviews and observations, the study conducted a quantitative survey with 131 teachers. The survey presented teachers with two alternate statements about teaching practices and asked them which one they agreed with most. This study provided insight into teachers' motivation for conducting some activities, but other activities were not observed often enough to help us understand why they took place. Consequently, we conducted Study 3 in the Morogoro region of Tanzania (Jukes et al., n.d.). This study involved asking teachers to speculate about the motivations of other teachers depicted in hypothetical scenarios. Each scenario described two fictional teachers who made contrasting pedagogical choices. The interviewee was asked which approach they agreed with most, and then were invited to speculate on the rationale for the teacher's actions in each case. The studies are described in greater detail elsewhere (see Jukes et al. 2018, 2019, 2021, n.d.). In the next section, we present the results of these studies selectively, along with other literature, to develop arguments about how the culturally influenced behaviors described above, manifest themselves in the classroom.

The Influence of Culture on Teaching Practices

In this section, we identify culturally influenced social behaviors of Tanzanian teachers and students that may differ from the behaviors of counterparts in WEIRD contexts and may have implications for the effectiveness of specific teaching practices. The behaviors are those we identified in the three studies. Although the studies differed in focus—one elicited parent and teacher perceptions, a second examined student characteristics, and a third observed teacher behavior—we identified themes in their findings that can be understood within the framework of how culture shapes human behavior, presented previously. The themes are confidence and curiosity; togetherness, fairness, and cooperation; embarrassment; and age-graded authority. Our primary interest is in the behavior of teachers and students, but our discussion also addresses cultural norms—the unwritten rules of social behavior in a cultural group—and values that guide these behaviors.

Confidence and Curiosity

As described in the introduction, extraversion, self-expression, and questioning are not encouraged among children in rural agricultural societies. Instead, there is a focus on respect, obedience to authority, and a desire to fit in. In the classroom, teachers refer to the lack of confidence and curiosity among students. This was evident in the studies in Tanzania. In Study 1 (Jukes et al., 2018), researchers asked parents and teachers in four rural schools about the qualities they wanted their children or

students to develop to be successful in life. Responses to this question were similar between parents and teachers—the most-valued competencies were being respectful, obedient, disciplined, polite, and calm. When the question changed to the qualities needed to succeed *in school,* parents gave similar answers to the first question. Teachers, however, emphasized the importance of confidence, curiosity, and being self-directed as important for learning. This finding suggests that parents in rural Tanzania are not typically raising children to be confident, curious, and self-directed, even though these qualities would serve them well in school. In fact, confidence is associated with negative qualities, such as being proud and "showy." Parents typically respond harshly to children who speak up; to encourage self-expression is to spoil a child. A second study in Tanzania (Jukes et al., 2019) developed tools for parents and teachers to rate students on qualities found to be valued in the first study. These ratings revealed demographic differences in students' competencies. Students in urban areas or with wealthier parents were rated as being more curious. This finding suggests that the mismatch between the values of parents and teachers is likely more pronounced in rural areas.

A third study in Tanzania (Jukes et al., n.d.) examined how the effectiveness of teaching activities related to the confidence and curiosity of students. A common practice in Tanzanian schools is for the teacher to ask for volunteers to answer questions or demonstrate an activity. Pupils raise their hands and wait for the teacher to call on them. Relying on volunteers to answer questions risks focusing instruction on a subset of the class. The study asked teachers in three regions of Tanzania for their perceptions on the characteristics of students who volunteered answers to questions or to demonstrate activities versus those who do not. The adjectives frequently used were "confident" and "curious" to describe those who volunteered and "shy" and "afraid to make mistakes" to describe those who do not volunteer. Teachers in rural areas were more likely to comment on this difference between children who participate in class and those who do not, in line with the hypothesis that rural students are less likely than urban students to be confident and curious.

Togetherness, Fairness, and Cooperation

The concept of togetherness, fairness, and cooperation are closely related. Togetherness refers to a sense of unity among the class that is reinforced by students being treated equally (fairness) and through working together (cooperation). Schooling may undermine these qualities when activities and assessments are conducted individually. For example, research in Mexico (Chavajay & Rogoff; 2002) found that mothers who had been to school for 12 or more years were less likely to engage in cooperative problem solving with children as compared with mothers who been to school for 2 years or fewer.

In the research in Tanzania (Jukes et al., 2019), teachers made several comments about classroom practices that related to the cultural norm of cooperation. One teacher underscored this interpretation of Tanzanian culture by saying,

> Independent learning is not effective because pupils always cooperate with others in life, even with normal things, so it will take more time for a pupil to understand when taught alone than in a group.

When it came to reading, some teachers said that allowing pupils to work alone actually led to less original thinking. The teachers said that giving one reading book to each child encouraged them to memorize the content rather than think for themselves. When pupils share books, they have less opportunity to memorize and have to work together to come up with the answers. Similarly, another teacher said, "When they cooperate in answering a question, they can feel a sense of togetherness and part of the group."

Teachers referred to togetherness (*Umoja*—"oneness" or "unity"—in Kiswahili) in many other aspects of classroom instruction. Direct cooperation is not necessary; conducting an activity as a group can promote togetherness. When asked to contrast the approaches of choral whole-class reading and paired reading, several teachers agreed with the notion that, as one teacher described it, the whole class reading together "promote[s] a feeling of unity and togetherness among them" (Jukes et al., n.d.).

To explain why teachers preferred to lead activities with the whole class rather than encourage group

work with less teacher involvement, one teacher said, "You know, when you do something together with your pupils, you get connected to them." Other research studies have made similar observations. Hoadley (2017), working in the early primary grades of schools in poor communities outside Cape Town, South Africa, observed the widespread use of chorusing and memorization, which generated "a synchrony between teacher and students so that classroom activity is fundamentally communal" (p. 1).

Qualitative research into the competencies valued by students, parents, and teachers (Jukes et al., 2018) revealed perceptions that help to explain the importance of connectedness in class. When asked about the qualities that students should possess, parents and teachers focused initially on social relationships and obligations, specifically, being respectful and obedient. Many students and some teachers talked of the importance of "loving" and "being loved" by their teacher. When discussing traits that promote learning, teachers were more likely than parents to mention intrapersonal traits, such as curiosity, confidence, and self-direction. Even though these traits are not overtly social, teachers and students frequently referred to social goals when describing their importance. For example, one teacher said that curiosity was valued in students because it results in the teacher "loving" the student.

Several teachers said they preferred certain instructional approaches because they avoided undermining class togetherness. For example, teachers were asked to explain the actions of another teacher in a hypothetical scenario where they asked the same question ("what is 2+4?") to several children in the same class. A common opinion was articulated by one teacher who said, "When you ask different questions, student[s] can sometimes feel divided." This helps explain why some teachers prefer not to ask students different questions, even though it would help them to check understanding among students. Similarly, teachers endorsed the practices of one teacher who, in a hypothetical scenario, rejected the approach of ability grouping in class. On teacher said "There was no segregation based on their ability. This kind of practice in…class brings unity." Conversely, teachers who did not agree with the strategy of differentiated instruction (i.e., giving different levels of reading books to different ability groups) referred to the effect on class unity. One teacher said the weak students "will see this as isolation from their strong students and mistreatment" and the students "will feel very bad about themselves."

Related to class unity is a sense of fairness. One teacher supported the practice of asking each child the same question by saying, "There is equality in the way children are treated. This can create a sense of unity among them." Another teacher said, "This is a fair approach because all students are treated equally …It makes them be one and feel they are together and united. They will love one another." Conversely, the teacher who gives different tasks to students based on ability "will cause students to hate one another and will be discouraged to continue studying." The importance of fairness was seen, not only in classroom practices, but also in the outcomes teachers are trying to achieve: "The teacher should work to make sure that all children are at the same level. The class should have the same understanding of things taught. There should not be too many variations in their attainments."

Some teachers showed awareness of the challenges posed by group activities. A few teachers said that some pupils were happy to go along with the group "like parrots." One teacher said, "There are those who are like a flag following the wind."

Responses from teachers suggested that the pupils who provide their own original answers were those who were "confident" and "curious," but that there were very few pupils who were like this in their classes.

Some teachers addressed the issue of conformity by repeating a question and encouraging a pupil to provide a different answer. Teachers also discussed the importance of using prediction questions (e.g., before reading a story) because this encouraged pupils to provide their own, unique answers. One teacher asked pupils to put their heads on their desks when answering questions non-verbally (e. g., raising a hand when a target sound is heard) to avoid copying responses from their peers.

Embarrassment

Collectivist cultures emphasize group harmony and status differences. For both of these reasons, it is important to avoid being publicly embarrassed (Merkin, 2018). This cultural value was evident in teachers' responses to hypothetical classroom scenarios. Nearly all teachers agreed that asking each student the same question was motivated by a desire to avoid the embarrassment of asking a student a question they cannot answer. One teacher pointed out that, in such a situation, there could be bad feelings for both student and teacher:

> They will be laughed at by their fellow students and develop bad feelings about themselves, which can result in teachers being seen as incompetent and unfit for the teaching profession.

One teacher said that, when being asked the same question repeatedly, "the children were happy because it gave them the easy-to-answer question. Students naturally do not like to be in tension when in class, so they were happy with repeating the same answers."

Other teachers gave similar responses and explained that when a student is embarrassed by failing to give a correct answer, the student will lose their motivation and competitiveness in their studies. As a result, students will be afraid to answer a question the next time.

Age-Graded Authority

As discussed previously, many rural agrarian societies in the world give children a lower social status than adults (Oburu & Palmérus, 2005), and much value is placed on respect and obedience toward adults (An et al., 2018; Jukes et al., 2018c; Serpell, 2011). Cross-national studies show that parenting in many non-WEIRD societies is more likely to be authoritarian (Bornstein, Putnick, & Lansford, 2011; Deater-Deckard et al., 2011) and less likely to be warm to children (Putnick et al., 2012).

This culture of hierarchical relationships between adults and children can transfer to schools. Practices in Botswanan schools mirror Tswana child-rearing practices where "students soon discover that (as in the home) in order to achieve some satisfaction they must adapt to the precepts which have been set from above" (Tabulawa, 2013, p.102). Students come to "fear freedom," to "learn not to think" (Tabulawa, 2013, p. 102). Pedagogical reform requires behavior change from the students and from the teacher. Students are habitually rewarded for being compliant to authority. Initial attempts to allow more freedom of self-expression may find students unprepared to respond. The teacher is used to being in control and is not comfortable letting go of that control.

One implication of hierarchical relationships is that the teacher feels comfortable leading all activities. This can be challenging for teachers when students are required to practice something independently. In Tanzania (Jukes et al., 2019), researchers found that teachers rarely conducted the "you do" part of the "I do, we do, you do" gradual release model. In a forced-choice questionnaire in the same study, teachers were asked to select which of two statements they supported most strongly. In each pair, one statement was more consistent with the goals of the project training than the other. The project-consistent statement that received the least support from teachers was, "When a pupil is new to a topic, he or she can learn quickly if he or she practices the new skills on his or her own." Only 44 percent of 131 teachers endorsed this. Most teachers (56 percent) endorsed the alternative statement instead: "When a pupil is new to a topic, it is difficult for him or her to practice new skills on his or her own."

Teachers explained their preference for leading classroom activities in several ways. As discussed above, teachers said that they felt connected to their class when they conducted activities together with them and they feared that weaker students would be isolated if not directly instructed by teachers. The subject of this section—hierarchical relationships between teachers and pupils—is an additional explanatory factor for teachers' behavior in such cases. This aspect of culture casts teachers as authoritative experts who must know more than their students. One teacher said, "it is a waste of time to ask [students] things they do not know."

Teachers may also be reluctant to invite questions from students in case they do not know the answer; this, in their view, would lead to questioning of their expert status. This problem is exacerbated by the

cultural need to avoid embarrassment, as discussed above.

The behaviors presented in this section are interrelated. Children's lack of confidence and curiosity is the corollary of a system of age-graded authority. The collectivist orientation that places value on togetherness, fairness, and cooperation also eschews embarrassment. To take these behaviors into account when implementing pedagogical reform, it may be necessary to view them as a system of cultural values rather than a list of discrete behaviors. We consider how to take these cultural values into account below after making explicit the learning goals of instructional activities in the next section.

How to Conceptualize Cultural Adaptation of Teaching Practices

The above section describes several aspects of culturally influenced social behavior in classrooms that arguably should be considered when adapting pedagogical approaches. How should this adaptation take place? In this section, we argue for a focus on the learning *principles* guiding pedagogical approaches, rather than on the approaches themselves.

For example, an extensive body of literature details evidence for and against student-centered approaches, also commonly referred to as learner-centered approaches and child-centered learning. Some focus on the successes of student-centered approaches (Katz & Chard, 1992; Vavrus et al., 2011), some chronicle their failures in both WEIRD countries and in LMICs (Christodoulou, 2014; Schweisfurth, 2011), and others argue for a balance of both teacher-led instruction and student-centered approaches (Mourshed et al., 2010). We argue that higher-order categorizations of pedagogical approaches as "student-centered" can be too general to analyze their appropriateness for a given cultural context. Instead, we advocate an analysis at the level of pedagogical principles and the theories of learning that underpin them. This approach builds on O'Sullivan's (2004) notion of *learning*-centered pedagogy and Schweisfurth's (2013) "minimum standards" of classroom practice, described in the introduction.

Our proposed approach shares principles of "backward design" (Wiggins and McTighe, 2005) in which teaching activities are explicitly designed around the goal of instruction and undergo iterative improvement (Anderson & Shattuck, 2012). The process we propose here involves two steps. The first step is to identify key principles of learning that should inform the design of pedagogical approaches. The second step involves adapting pedagogical approaches to cultural context while still adhering to the principles of learning outlined in the first step. Below, we outline three such principles of learning that can arguably be applied to the design of pedagogical approaches in all cultural contexts.

First, one way that knowledge can be built in educational settings is through children participating in their own learning (Inhelder & Piaget, 1958). For some, this means children engaged in learning a new skill through group problem solving; for others, it means independent practice after the teacher has introduced a new skill. Although many pedagogical reform efforts in LMICs have been hindered in their attempts to increase children's participation in their own learning, such participation is common in learning outside the school, where observation and apprenticeship are prevalent (Chavajay & Rogoff, 2002; Lave & Wenger, 1991). Integral to this best practice is the idea that children learn by doing. For example, to learn how to count objects, the child touches and counts the objects themselves, while to develop spatial awareness, a child uses blocks and other objects. To learn to read, a child practices reading, and to learn to write, the child practices writing. The challenge is to design of pedagogical approaches that increase children's participation in their own learning while addressing the barriers described previously to teaching activities such as the "you do" section of the gradual release model and pair work during the lesson.

The second principle is that children learn at different paces. There is research on developmental progressions and evidence that children move through these progressions; however, much of this research is from Western countries (Clements & Sarama, 2014). Regardless of the progression, we do know that children everywhere do not learn at the

same pace, so one 6-year-old child may be able to only read basic, simple words, while another 6-year-old child can read a paragraph fluently. Because children learn at their own rate, instruction that provides targeted support and scaffolds the next level of learning for a child is important. As Vygotsky (1978) theorized, each child has a zone of proximal development (ZPD) that represents what the child can do with the help of a more knowledgeable other. The ZPD is where instruction should be targeted. For example, consider a child who can read simple words on their own; with the help of a teacher, this child may be able to read a simple sentence containing simple words. Reading simple sentences is the child's ZPD. At any moment in time, children of the same age within the same grade may have different ZPDs. Pedagogical approaches should address the needs of learners at different levels while accounting for teachers' preference for whole-class direct instruction, described above, which limits the potential for differentiated pace and methods of instruction.

The third principle is that teachers need a means to assess students' levels—both formally and informally—to adjust their instruction to the different paces at which children learn. For formal assessments, this may entail a math test at the end of a unit (summative assessment) or asking a child to read aloud a series of graded passages. For informal assessments, the teacher can monitor progress and check for understanding throughout a lesson. Monitoring requires individual answers from students, rather than parroting those of their fellow student. A common model of instruction that allows for informal assessment is the direct instruction model used with the Tusome Pamoja classroom, described above. The last part of the model, the "you do" section, asks students to individually practice what they just learned (e.g., writing a sentence or reading a sentence). During this independent work time, teachers can monitor student progress. Above, we described how teachers' preference for leading activities can be a barrier to the "you do" part of the instructional model. Other teacher practices, such as repeatedly asking students the same question and whole-class instruction, can also limit teachers' ability to monitor student progress in this way. Our aim is to design pedagogical approaches that allow teachers to monitor student progress while accounting for these barriers to effective practice.

An Agenda for Research and Practice in Culturally Relevant Pedagogy

The previous two sections outline the challenges. The design of effective pedagogical approaches should be based on established learning principles (outlined in the previous section) while accounting for the norms of togetherness, fairness, and cooperation; avoiding embarrassment; respecting age-graded authority; and addressing children's reticence in speaking to adults (outlined in "The Influence of Culture on Teaching Practices" section of this paper). In response to this challenge, our focus is mainly on adapting pedagogical approaches that respect or build on cultural norms. In addition, we explore approaches to support behavioral change in students. We are open to the possibility that instruction could be improved by attempts to change cultural norms in the classroom. However, we argue that most donor-funded interventions already take this approach, either having teachers act explicitly against social norms or else designing teaching activities with little regard to norms. Our aim is to expand the toolkit available to educators by considering alternative approaches. Below, we first discuss ways to support behavior change in students, increasing their participation and practice of skills; second, we consider ways to re-imagine pedagogy.

How can students be supported to engage more effectively with participatory teaching methods? As discussed in the previous sections, students in many rural agricultural settings are reluctant to speak up and participate in classroom activities. Teachers describe them as lacking the confidence and curiosity to participate. However, we can interpret children's behavior as fulfilling what they perceive as being their social role—to be quiet and listen to adults. Evidence suggests that the norms of classroom participation can be shifted relatively quickly with sustained effort. For example, the Education Quality Improvement Program-Tanzania (EQUIP-T), a school reading program, used pedagogical approaches, including songs and learning games, to develop preschool children's social and emotional competencies in 16

weeks; the program reported children's improved confidence in speaking up during the time period (EQUIP-T, 2017). A preschool program in Ghana (Wolf et al., 2019) encouraged teachers to focus on developing socioemotional learning competencies, including confidence and curiosity. Although this program was successful in improving educational outcomes, encouraging more parental participation in the program reduced its effectiveness. This underscores the potential clash between the values of parents (respect and obedience) and teachers (confidence and curiosity) discussed above.

Some strategies could be explored to help address this difference in values. First, greater parental involvement in the design of education interventions may help negotiate an approach that is effective and acceptable to both parents and teachers. Alternatively, pupils may become adept at cultural frame switching, akin to that found in bicultural communities (Verkuyten & Pouliasi, 2006). In other words, children may learn to behave one way in the classroom and another way at home. Anecdotally, such frame switching is already common in Tanzania. Additionally, a growing body of work highlights the importance of creating a positive emotional climate in classrooms to support children's participation in their learning (Randolph et al., 2019). Future research could examine whether a short program of participatory teaching activities and improved classroom climate promotes students' confidence and curiosity in class and whether such a program has a long-term impact on teaching practices and student learning.

How can pedagogy be adapted with cultural contexts in mind? As discussed above, we address this question by designing approaches that adhere to key learning principles and account for cultural and social norms. First, we consider how to allow children to practice skills and teachers to assess skills while maintaining age-grade authority and teachers' desire not to embarrass students. One possible solution is to design activities that are done in whole groups but require individual answers. For example, consider the thumbs up, thumbs down activity, a type of activity that is used frequently in teacher guides and described by a teacher respondent in one of our studies (Jukes et al., 2019), where the teacher asks the whole group to do something, but requires individual responses. For example, the teacher asks students to put their heads down on a desk, and says, "I am going to say some words. Put your thumb up when you hear the sound /m/ at the beginning of the word." The students answer individually, as they cannot see other students' answers, providing them with the important goal of independent practice. The teacher can also evaluate each child at the same time, accomplishing the goal of informal assessment.

Another possible solution to remove the embarrassment of incorrect answers in classrooms is to redesign classroom discussions where students are asked to publicly provide solutions and their thinking to problems without first checking if it is correct. Consider, for example, in a math classroom, where a teacher puts a problem on the board and asks students to give their answer and explain how they solved it. In mathematical discussions, both correct and incorrect solutions are integral to understanding the problem—the wrong solution often provides insight into why a mathematical solution works in the first place and provides an opportunity for justification of mathematical facts. However, there may be two aspects that are problematic here: first, when the incorrect answer comes from the student, it goes against the norm of preventing embarrassment. Second, teachers may not want children to discuss incorrect responses, for fear that this may interfere with children's learning of the correct answer. In such cases, teachers may consider strategies other than encouraging both correct and incorrect responses from students. For example, the teacher can instead create an incorrect solution from a hypothetical child in another classroom or school (e.g., "I was talking to another second grader at a different school, and they said the answer was [blank]) and ask all students in the classroom to come up with a group response to this "other" student. In this way, no individual child in the class is singled out for incorrect responses, while at the same time providing the opportunity for deep mathematical discussions. Further, teachers can emphasize that the response of this "other" child is incorrect and focus on explaining why it was incorrect, thereby making it less likely that a student may think that an incorrect solution is correct.

Next, we turn to the issue of children learning at different paces and the need for informal and formal assessment to accurately understand and teach to these different paces. If classroom culture is focused on togetherness, it may be difficult to teach to different paces. The primary way of meeting the needs of children who learn at different paces is through differentiated instruction, where teachers can both diagnose individual students' needs and direct instruction to each student to meet their needs. At the heart of differentiated instruction is the idea that children learn differently, and instruction is best when those different needs are addressed (Tomlinson, 2000; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2004; Shillady, 2013; and Slavin, 1987). However, efforts to introduce differentiated instruction have failed in many parts of sub-Saharan Africa.

Given the strong emphasis on cooperation, there may be ways to modify differentiated instruction so that teachers do not feel like they are encouraging children to learn at different paces. One possibility is to help the teacher to create class groupings composed of students who are at similar learning levels. In this way, learning within that group can progress relatively uniformly, and students can cooperate with others at their level. Interventions that aim to increase use of differentiated instruction often rely solely on the needs of the individual child, not a group of children. By changing the focus to groups of children instead of individuals, efforts may better align to the existing classroom culture. In addition, instead of emphasizing independent practice, students may respond better to working together to come up with common solutions to problems. A small exploratory study conducted with pre-primary teachers in multigrade classrooms in Kenya provides initial positive evidence for teachers differentiating activities by groups of students instead of individual students (Sitabkhan, Jukes, Dombrowski, & Munialo, n.d.). The current research, described here, suggests that any initiative to differentiate instruction should take care to avoid its socially divisive effects and the stigma associated with being in the lower-achievement groups. Differentiation at the school level may be less problematic than within-class groupings. Such a school-level approach has been successful in improving learning through the "Teaching at the Right Level" programs in Africa and Asia (e.g., Duflo et al., 2011). These programs temporarily reallocate students to different classes on the basis of their achievement levels.

An emphasis on group-level differentiation does, however, present a challenge in that group work is difficult to implement in the classroom. There is a large amount of evidence showing how group work has failed, both in WEIRD contexts and in LMICs (Westbrook et al., 2013; Kutnick et al., 2005). The reported failures are multiple. In some cases, students continue to work independently in their groups, undermining the goal of cooperation in group work. In other cases, teachers do not allow groups to have autonomy in completing their task and retain control over the classroom. However, some of these reported failures derive from an all-or-nothing view of group work in which instruction is criticized for falling short of the ideal. Instead, we emphasize the key learning principles that can be met through group work. For example, we may choose to accept that teachers maintain control over group work and that child autonomy is limited while recognizing that such an approach still gives students the opportunity for more individual practice. In this sense, the group work reported in previous studies would not be seen as a failure, but rather an adaptation of an instructional approach within cultural norms. Table 1 lists the promising classroom practices discussed in this section and the challenges, stemming from cultural values and behavior, that they address.

The above discussion suggests how pedagogical approaches may be adapted or redesigned to be more effective in different contexts. These ideas need to be tested in practice. One possibility is to co-create strategies with teachers (Voogt et al., 2016) that address best practices in learning, detailed above. For example, teachers and researchers can partner to create guidelines that meet the goals of learning but also are in line with cultural norms; these guidelines can be piloted in real classrooms and adjusted as needed. For example, teachers and researchers can co-create guidelines around what types of work can be assigned for group work. These guidelines could include the types of skills students are practicing

Table 1. Summary of culturally related challenges for classroom practice and promising directions to tackle them

Cultural Value or Behavior	Barrier to Learning	Promising Classroom Practice
Lack of confidence and curiosity—children are not encouraged to speak in front of adults	• Students do not participate in their own learning, e.g., they do not volunteer answers or ask questions	• Encourage children's participation • Change classroom norms and climate • Involve parents in discussions about behavioral norms
Embarrassment	• Asking all students identical questions, asking simple questions	• Student responses not visible to the rest of class, e.g., children close eyes and respond nonverbally • Examine hypothetical incorrect answers
Togetherness, fairness, and cooperation	• Lack of individual practice • Lack of differentiated instruction • Reluctance toward group work • Conformity in student responses	• Differentiate instruction in larger, cooperative groups • "Teaching at the Right Level" programs
Age-graded authority	• Teacher-led instruction dominates individual practice and group work	• Explore more teacher-led forms of group work

(i.e., new or previously learned) and the work that is expected to be produced (i.e., one product per group or individual). Closely working with teachers on the types of practices that are most conducive to their cultural context may help promote more-effective pedagogy. Recent work, based partly on the research presented in this article, has been successful in co-creating, with teachers, more effective approaches to positive discipline in the classroom in Tanzania (Randolph et al., 2020).

Finally, changing the way pedagogical strategies are presented to and perceived by teachers may also lead to higher uptake. For example, training and curriculum materials can emphasize that group work does not have to be the (imported) ideal of facilitated learning with the teacher playing a secondary role. Instead, we can pilot approaches to training teachers on group work that is described in terms of classroom norms and how it fits into what teachers want for their students. Similarly, differentiated instruction may depart from the individualized assessment and instruction that is often presented as the ideal in literature, being framed instead as ways for teachers to help children be more together at the same learning level by providing instruction according to children's need.

Discussion and Conclusion

Our aim in this paper was to address the well-documented challenge of introducing new pedagogical approaches into classrooms in LMICs, particularly where the new approaches are not compatible with the cultural norms that affect how the targeted teachers and students interact. One motivating factor for the paper was our observation that a common approach to the issue of cultural mismatching is to try and change teacher behavior. Such approaches ask teachers to change in ways that may not be easy for them or that create teacher resistance to new approaches. Others recognize the difficulty of teacher behavior change and provide intensive support and coaching to make it happen. Our contention is not that these approaches are destined to fail, but that alternative methods have not yet been fully explored. In particular, less attention has been given to the design of teaching activities to increase their compatibility with cultural norms. Better yet, involving teachers in the design of such activities could be critical to their successful adoption.

However, it may be difficult to change the design of teaching activities without also reducing their impact on student learning. One approach we advocate is focusing teaching activities on the learning goals that curriculum developers and teachers consider most important. For example, group work may be redesigned so that there is less emphasis on student-directed learning while still allowing time for

individual practice. Articulating the goals of teaching activities can help in the process of their redesign, in particular when involving teachers in the process. When the learning goals are explicit and deeply understood by teachers, finding a solution that meets these goals while respecting cultural and social norms is more achievable.

Similarly, it is important to make explicit the cultural norms that may act as barriers to pedagogical reform. These barriers are often unspoken. Our experience from the research in Tanzania is that these barriers were rarely offered up in response to initial open-ended questions; some degree of probing was always required. Once the social goals of instruction are made clear, it is easier to design teaching activities around them. We recommend further research aimed at unearthing implicit goals of instruction and barriers to change so they can be addressed in instructional design. It may be critical to include time in professional development programs to surface teacher concerns about teaching activities.

Our position in this paper should not be seen as being opposed to changing teachers' behavior or to reforming classroom culture. Our argument is that it is difficult to change behaviors that are based on cultural values, and pedagogical reforms are more likely to be successful if they work with the grain rather than against it. At a minimum, culturally relevant adaptations to teaching activities are an underexplored approach to improving the implementation of new pedagogical approaches. Further research and experimentation will help us understand when an activity should be adapted to teachers' behavior or when teachers' behavior should be adapted to the activity. Better yet, we may be able to move beyond the adaptation of imported teaching methods and develop the science of culturally grounded pedagogy more generally.

In addition to adapting teaching activities, we explored developing student competencies—for example, developing their confidence to speak up in class. On the surface, this approach goes against the principle of this paper (i.e., working with, rather than against, norms of behavior). However, this is not an external agenda being imposed on a classroom. The idea of developing students' confidence came from teachers themselves. Some children—particularly those with educated parents, living in urban areas—have the confidence to speak up, and teachers see this competency as important for helping children learn. Thus, even in societies where this behavior is not common, it is still encouraged by some sections of the society. Some evidence (EQUIP-T, 2017) suggests that children can learn relatively quickly to participate more in class. Encouraging this behavior may be a simple way to improve teaching and learning in societies where it is not the norm for children to speak up.

One important qualification to the research presented in this paper is that we did not attempt to present a balanced view of teacher behavior. We intentionally focused on teacher beliefs and behaviors that have received less attention in the literature and which may not be typically considered when designing teacher professional development programs. Our paper focused on teachers who, for example, had reservations about conducting group work. Other teachers in the study were more supportive of the instructional goals of group work and less concerned about its potential to undermine the social goals of instruction. A natural question for future research, then, is to understand the prevalence of the beliefs depicted in this paper and the situations and determinants that give rise to these beliefs.

As we discussed in the introduction, cultural orientations differ within societies and over time. Research suggests that urbanization, education, and technology all play a role in shaping these cultural orientations. Among societies with a history of widespread subsistence agriculture, some will exhibit greater change in values than others. Teachers are among the most-educated individuals in society and may constitute the vanguard of changing attitudes. In addition to research documenting these changes, it is also important to assess the beliefs and attitudes of teachers in a given setting to inform the design of professional development programs. Engagement and voice have a critical role in the development of culturally responsive pedagogy.

We have cautioned against making assumptions that instructional methods from WEIRD societies are appropriate in LMICs. It is equally inappropriate to

make the opposite assumption that teachers would not be capable of incorporating a new technique into their pedagogical repertoire. In fact, such an assumption is particularly troubling if it leads to the imposition of a different—possibly lesser—education on already disadvantaged students. Testing assumptions and giving power to teachers and students to choose the form of their own education can guard against such an outcome.

There is much to understand about the nature of beliefs and attitudes in many LMICs. For example, despite the focus on cooperation in the discussion above, competition has a strong role in the Tanzanian classroom. Students can typically tell you their position in the class and, in some cases, are assigned desks according to their position. Some teachers in our research discussed how they used competition to motivate students. Understanding the relative role of competition and cooperation is one example of how research can improve our understanding of the cultural context of classrooms in rural Tanzania and similar settings.

There is clearly much work to be done. Our paper aimed to map out avenues for future research and practice to improve teaching and learning based on an understanding of culturally influenced beliefs and behaviors. We outlined some principles to guide this work: make explicit the learning goals of classroom activities and the social norms of the classroom to design instruction that is responsive to both. One effective approach would be to involve teachers in the co-creation of activities. On the basis of research in the one context of rural schools in Tanzania, we suggested some instructional approaches that follow our suggested principles. These are the first steps in exploring a new way of approaching teacher professional development. We hope others also see the potential benefit for improving the implementation and effectiveness of instructional strategy and find ways to experiment with their own work.

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