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How to improve student learning in every classroom now

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ABSTRACT

This paper is our attempt to help any of the world's 60 million teachers who ask, "What can I do right now to improve learning in my classroom?" We describe three easy-to-use teaching tactics derived from applied behavior analysis that consistently yield measurably superior learning outcomes. Each tactic is applicable across curriculum content and students' age and skill levels. Considerations for using digital tools to support and extend these "low-tech" tactics are also discussed.

1. Introduction

Education is fundamental to all other human rights (Committee on Economic, Social and Cultural Rights, 1999; UNESCO, 2016). As noted by Lee, "[I]f children receive basic primary education, they will likely be literate and numerate and will have the basic social and life skills necessary to secure a job, to be an active member of a peaceful community, and to have a fulfilling life" (Lee, 2013; p. 1). Yet many children worldwide, rich and poor fail to receive even a basic primary education. Overcrowded classrooms, untested and ineffective curricula, and inadequately prepared or underpaid teachers are often to blame. Absence of the most basic instructional materials such as textbooks and chalkboards is a barrier in the poorest countries (Hillman & Jenkner, 2004). Simply spending money on education is not the answer. Countries that spend billons on school-reform "solutions" also struggle to educate all their students.

Although school reform is a complex problem warranting large-scale, systems-based solutions, individual teachers can make a tremendous difference in student learning by focusing on *alterable* variables. Alterable variables are factors that both impact student learning and can be controlled by teaching practices (Bloom, 1980). Alterable variables include critical dimensions of curriculum and instruction such as the amount of time allocated for instruction; the selection and sequence of content examples and non-examples; the type and sequence activities within a lesson; the pace of instruction; the frequency and type of student response (e.g., recognition or recall) with which students actively participate during instruction; how and when teachers provide praise or other forms of reinforcement; and how errors are corrected.

Applied behavior analysis (ABA) provides a scientific approach to designing, implementing, and evaluating instruction based on empirically verified principles describing functional relationships between events in the environment (e.g., what the teacher does) and desired behavior change (e.g., student learning) (Baer, Wolf, & Risley, 1968; Baer, Wolf, & Risley, 1987;

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Cooper, Heron, & Heward, 2007). Research by applied behavior analysts has helped identify alterable variables and developed many classroom-tested teaching strategies and tactics focusing on those variables (Chance, 2008; Embry & Biglan, 2008; Greer, 2002; Heward et al., 2005; Twyman, 2014a; Vargas, 2013). The most robust of these practices—those that consistently yield measurably superior student learning outcomes for learners of all ages and performance levels—share a common framework: sound instructional design (Markle, 1983/ 1990; Twyman, Layng, Stikeleather, & Hobbins, 2005), high rates of relevant learner responses with contingent feedback (Hattie & Timperly, 2007; Heward, 1994), and ongoing instructional decision-making based on direct and frequent measures of student performance (Bushell & Baer, 1994; Greenwood & Maheady, 1997).

We describe three teaching tactics derived from or refined by ABA that embody or make transparent each of these fundamental elements; tactics with which teachers in any classroom, rich or poor, can tackle a common problem.

2. Low-tech solutions to a universal problem

Group instruction is the global norm (see Fig. 1) and the most common teaching arrangement regardless of grade level (Hollo & Hirn, 2015). Instructing more than one student, be it an entire class or a small group, presents five simultaneous challenges: maintain students' attention, give each student sufficient opportunities to respond, provide individualized feedback for students' responses, monitor each students' learning, and prevent and deal with disruptive behavior. Meeting these challenges is so demanding that when students simply pay attention (e.g., look at the teacher, the board, or lesson materials; watch a peer respond) and do not misbehave, it is taken as evidence of a successful lesson.

Students, and teachers, deserve more. We describe three research-based tactics—choral responding, response cards, and guided notes—that increase active student responding (ASR; Heward, 1994) and help teachers meet all five challenges of group instruction. When properly implemented, each tactic enables all students in the class to respond frequently throughout the lesson, incorporates feedback to students, gives the teacher ongoing assessment of students' understanding of the lesson, encourages on-task behavior, and promotes learning.

In addition to its strong research support, each tactic is a "low-tech" application that can be used in any classroom. Low-tech solutions are cost-free or entail only nominal expenditure for materials (e.g., pencils, paper, notecards, file folders), require no hardware or batteries, need no maintenance or software to keep current, do not involve software or Internet/connection glitches, are easy and quick for teachers to learn, and can be implemented straight away in any classroom.

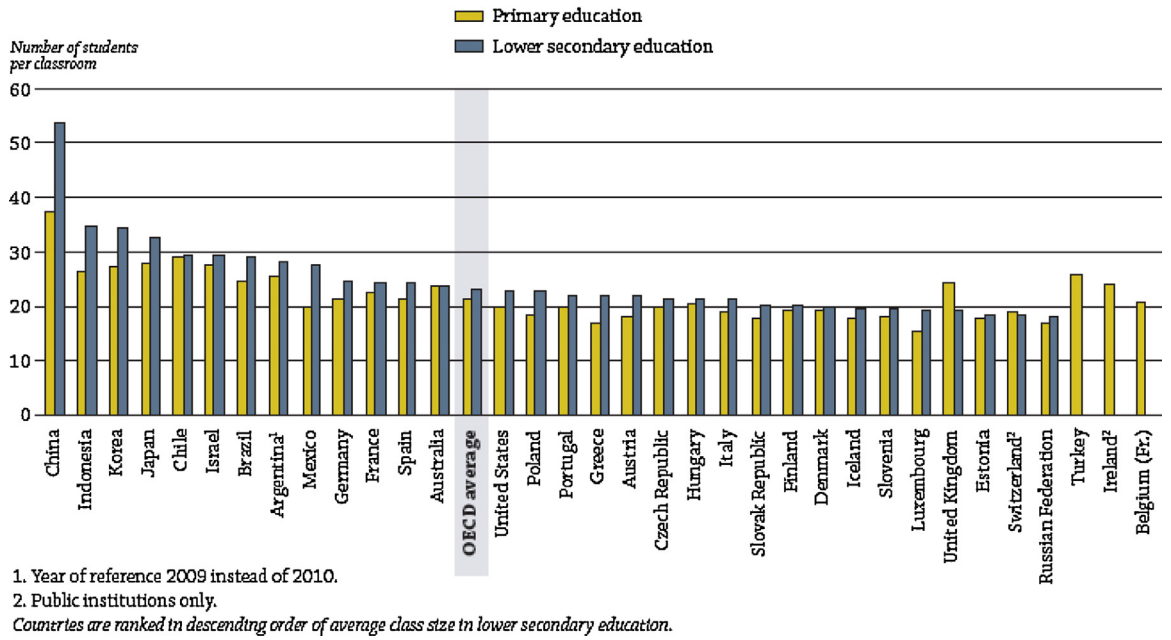

Fig. 1. Mean number of students per classroom in primary and lower secondary public schools by country.
Source: Organization for Economic Co-operation and Development (2012). "Education Indicators in Focus: How does class size vary around the world?" http://www.oecd.org/edu/skills-beyond-school/EDIF%202012–N9%20FINAL.pdf.

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