THE SCHOOL DYNAMICS MODEL

Different Kids: The Challenge of Differentiated School Achievement: A Systems Analysis of the Achievement Gap

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Abstract: This computer simulation analysis addresses the well-known problem of what is commonly referred to as "the achievement gap." Children begin school with significantly different levels of "readiness" for school. However, in the typical American school, these gaps persist and are reflected in lower achievement and higher dropout rates for students with low initial entry characteristics.

Many writers and researchers have addressed this problem, usually focusing on discrete contributing factors. This analysis addresses the problem holistically. It draws on an extensive literature to lay out a theory about how in most schools in this country the interactive dynamics of leadership, instruction, relationship, and motivation drive expanding academic variance among students in response to their initial entry characteristics.

The simulation results provide confidence that the basic theoretical structure of this idealized school is sound. When run in its root form as a "typical" school, it reproduces the widely observed longitudinal gaps in academic performance among students with *initially* high, average and low levels of readiness for school. Not only does academic performance reproduce this essential reference behavior but, in addition, the concurrent changes in the different levels of key internal school variables also mirror the dynamics of real schools: for example, quality and intensity of instruction, student academic motivation, student work effort, and relative student suspension rates also are consistent with these dynamics. Furthermore, when simulated experiments are performed on the model, examining the effects of policy-driven changes in teacher quality, the quality of school leadership, the level of interest in schools of community leaders, and student resiliency and personal intelligence, the effects are to alter the relative achievement gaps (and the dynamically associated variables) in empirically recognizable ways.

According to the theory, and the model that renders that theory operative in computer simulation form, these variables all matter—and while teacher quality *per se* makes a significant difference, school leadership and the interest in schools of community leaders, which influence teacher quality (through recruitment, selection, supervision, professional development, and in securing the financial resources and continuing good leadership to sustain these efforts) and which influence other factors, such as providing collateral assistance to low-achieving students and providing a rigorous curriculum to all students, work in combination to bring initially low-achieving students up to grade-level standards and to raise the academic performance of initially average- and high-achieving students to increasingly higher levels.

In this manner, this work with the simulation is useful with respect to both policy and research. With respect to policy, it highlights the importance not only of teacher quality—and, therefore, of teacher training, supervision, and professional

development—but also of inspiring school and engaged community leadership. This implies the recruitment, selection, and preparation of school leaders with well-developed in-school skills (including knowledge, vision, courage, and moral fiber) related to quality instruction, rigorous content, and to the creation and maintenance of high-performing school cultures—and, in addition, with strong personal intelligence, resilience, and political acumen.

With respect to research, the simulation exercise calls upon scholars to assess, correct, and validate the structural theory represented in the model and, in particular, the validity and effect sizes of the pairwise causal relationships that comprise the model. This is important because, while the general structure seems sound (as a reflection of the basic dynamic structure of schools), leading to model outputs that seem robust as general *patterns* of behavior, the *strength* of these effects over time—for example, in influencing the relative achievement of initially high, average, and low readiness-for-school students—is highlighted by this research as a target for further empirical study.