

Other Topics

On Mastery Learning and Mastery Teaching

Research does not support that group-based mastery learning or Madeline Hunter's methods increase student achievement.

In an interview with Ron Brandt published in the October 1988 issue of *Educational Leadership*, I called for better research on practical programs for improving student achievement. In that interview I criticized research on two widely used programs: Benjamin Bloom's (1984) mastery learning programs, and Madeline Hunter's (1982) Mastery Teaching or Instructional Theory into Practice model. Replies from prominent proponents of these approaches appeared with the interview. Benjamin Bloom, James Block, Thomas Guskey, and Herbert Walberg responded to my comments about mastery learning; Madeline Hunter responded to those relating to her model.

Mastery Learning

My critique of mastery learning is based on a review of the literature on that topic published in the *Review of Educational Research* (Slavin 1987a). I invite those interested in research on mastery learning to read the review,

critiques of it by Anderson and Burns (1987), Guskey (1987), and Bloom (1987), and my response to those critiques (Slavin 1987b), and to draw their own conclusions about where the weight of the evidence truly lies.

Bloom's response to my *Educational Leadership* interview misinterpreted my views on mastery learning.

I was amazed to find that much of the evidence cited for the effectiveness of group-based mastery learning involved very brief, often artificial experiments.

He expressed the hope that "perhaps at some time in the distant future, even Robert Slavin will declare a truce in his opposition to mastery learning" (p. 28). Both he and my other critics imply that I am opposed to mastery learning *in principle*. I'm not, and I said so in the interview and in my *RER* article. My own Success for All program (Madden et al. 1989) is based on mastery learning principles. I have written favorably about *continuous-progress* forms of mastery learning (Slavin 1987c, Slavin and Madden 1989). Further, one of my cooperative learning programs, Team Accelerated Instruction (Slavin et al. 1986, Slavin 1987d) uses continuous-progress procedures, including formative and summative testing.

My only quarrel is with *group-based* mastery learning, or Learning for Mastery (Block and Anderson 1975), where teachers teach a whole-class lesson for several days or weeks, assess student mastery, and provide a period or two of corrective instruction

to non-mastery students while the other students do enrichment activities. Again, I have nothing against this form of mastery learning in principle. Nancy Karweit and I conducted a study of this program in Philadelphia, fully expecting it to be effective (Slavin and Karweit 1984). When we found no differences between mastery learning and a control group in mathematics achievement in a yearlong study, I was surprised and began collecting other studies of group-based mastery learning. I was amazed to find that much of the evidence cited as support for the effectiveness of the approach involved very brief, often artificial experiments. I then conducted a systematic review of the literature, using a procedure I call "best-evidence synthesis" (Slavin 1986). This procedure combines the use of effect size estimates and systematic literature search methods characteristic of meta-analysis (Glass et al. 1981) with the description of individual studies and attention to substantive and methodological issues characteristic of the best narrative reviews.

Guskey and Walberg attempted to discredit my review by implying that my study selection procedures were arbitrary and suspicious, that I excluded large numbers of studies until the final set confirmed my alleged "anti-mastery" bias. This is simply false. The only selection criterion that resulted in large numbers of studies being excluded was the four-week duration requirement, which I think any educator would consider minimal. My main review then focused on 17 studies, more elementary/secondary studies of at least four weeks' duration than the 14 cited by Guskey and Gates (1986) or the 9 cited by Kulik and colleagues (1986).

I did place particular emphasis in my review on seven studies that used standardized measures of reading or mathematics, five of which had durations of almost a full school year. Not one of these studies found a statistically significant (much less educationally important) positive effect on student achievement. Despite Guskey's assertions to the contrary, these are studies of group-based mastery learning just as Block and Anderson (1975) described it; in fact, one of them is by Anderson himself (Anderson et al.

For most educators, the uncontested finding that yearlong studies show no greater effects for mastery learning than traditional methods on standardized measures should be the end of the story.

1976). I did not exclude any studies that used standardized measures, because all such studies had durations of more than four weeks. Far from arbitrarily whittling down a large literature, my seven studies with standardized measures were five more than those located by either Guskey and Gates (1986) or Kulik and colleagues (1986). No critic of my mastery learning review has ever suggested that I missed or excluded any experimental/control comparisons that found positive effects of group-based mastery learning on standardized measures. For most educators, the uncontested finding that yearlong studies show no greater effects for mastery learning than traditional methods on standardized measures should be the end of the story.

Standardized measures are important in the literature because the experimenter-made measures used in most mastery learning evaluations are often biased in favor of the experimental group—they may be keyed to the objectives taught in the mastery learning classes but not in the control classes. However, even among such studies the median effect size was only +0.26, nowhere near the estimates of close to +1.00 claimed or implied by Guskey and Gates (1986), Bloom (1984), and Walberg (1984).

Block's critique of my interview claims positive effects for mastery

learning in "quasi-longitudinal" studies—evaluations finding, for example, that this year's 3rd graders are doing better than last year's. As I noted in the interview, such evaluations, categorized as "pre-scientific" by Campbell and Stanley (1963), are worthless under today's conditions. Since about 1978, standardized achievement test scores have risen across the country as districts have discovered that scores can be inflated by increasing grade-to-grade promotion standards, by closely aligning curriculum with the standardized tests, by teaching test-taking skills, and other strategies. Often, mastery learning is introduced as an integral part of a higher standards/curriculum alignment plan; so separating out the effects of the teach-test-corrective instruction-retest cycle of group-based mastery learning is impossible.

The Hunter Model

As with mastery learning, my argument with Madeline Hunter has to do with evidence of effectiveness, not a fundamental difference in philosophy. I'm an admirer of Madeline Hunter as a staff developer; I wish every teacher could hear her speak. However, it is quite another question whether her model is in itself *effective* at bringing about improved student performance. Three studies have found that it is not (Donovan et al. 1987, Mandeville 1988, Stallings and Krasavage 1986). Each of these studies may be faulted on one ground or another, and in her response to my interview Hunter does so. It is impossible to prove that an educational method does *not* work. But where is the evidence that it *does*? Hunter cites a study by Rodney Skager in Los Angeles. I wrote to Skager to obtain his report. He responded that the study was unpublished, unavailable (even *he* had lost his copy), and deeply flawed (Skager, 1988).

On Shaky Ground

I hereby declare a truce with proponents of mastery learning and with Madeline Hunter. I have nothing against their methods in principle. Group-based mastery learning and Mastery Teaching may be beneficial in adding to teachers' repertoires or in giving them a language to describe

found to be detrimental to student achievement. School districts may certainly introduce such methods as general staff development to give teachers new ideas.

However, if school districts expect that by introducing group-based mastery learning or Madeline Hunter's methods they can measurably increase their students' achievement, there is little evidence to support them. Districts that *require* teachers to use these methods or that use teacher evaluation procedures based on them are on particularly shaky ground. Research may eventually find experimental-control differences on fair achievement measures over reasonable periods that will convincingly support one or the other of these methods. But until such evidence exists, there is no basis for asserting that either method can substantially accelerate student achievement. □

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References

Anderson, L.W., and R.B. Burns. (1987). "Values, Evidence, and Mastery Learning." *Review of Educational Research* 57: 215-223.

Anderson, L.W., C. Scott, and N. Hutlock. (April 1976). "The Effects of a Mastery Learning Program on Selected Cognitive, Affective, and Ecological Variables in Grades 1 Through 6." Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Block, J.H., and L.W. Anderson. (1975). *Mastery Learning in Classroom Instruction*. New York: Macmillan.

Bloom, B.S. (1984). "The Search for Methods of Group Instruction as Effective as One-to-One Tutoring." *Educational Leadership* 41, 8: 4-17.

Bloom, B.S. (1987). "A Response to Slavin's Mastery Learning Reconsidered." *Review of Educational Research* 57: 507-508.

Brandt, K. (October 1988). "On Research and School Organization: A Conversation with Bob Slavin." *Educational Leadership* 46, 2: 22-29.

Campbell, D.T., and J.C. Stanley. (1963). *Experimental and Quasi-Experimental*

Designs for Research. Skokie, Ill.: Rand McNally.

Donovan, J.F., D.A. Sousa, and H.J. Walberg. (1987). "The Impact of Staff Development on Implementation and Student Achievement." *Journal of Educational Research* 80: 348-351.

Glass, G., B. McGraw, and M.L. Smith. (1981). *Meta-Analysis in Social Research*. Beverly Hills, Calif.: Sage.

Guskey, T.R. (1987). "Rethinking Mastery Learning Reconsidered." *Review of Educational Research* 57: 225-229.

Guskey, T.R., and S.L. Gates. (1986). "Synthesis of Research on the Effects of Mastery Learning in Elementary and Secondary Classrooms." *Educational Leadership* 43, 8: 73-80.

Hunter, M. (1982). *Mastery Teaching*. El Segundo, Calif.: TIP Publications.

Kulik, C.L., J.A. Kulik, and R.L. Bangert-Drowns. (April 1986). "Effects of Testing for Mastery on Student Learning." Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Madden, N.A., R.E. Slavin, N.L. Karweit, and B.J. Livermon. (February 1989). "Restructuring the Urban Elementary School." *Educational Leadership* 46, 5: 14-18.

Mandeville, G. (April 1988). "An Evaluation of PET Using Extant Achievement Test Data." Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Skager, R. (September 21, 1988). Personal communication.

Slavin, R.E. (1986). "Best-Evidence Synthesis: An Alternative to Meta-Analytic and Traditional Reviews." *Educational*

Researcher 15, 9: 5-11.

Slavin, R.E. (1987a). "Mastery Learning Reconsidered." *Review of Educational Research* 57: 175-213.

Slavin, R.E. (1987b). "Taking the Mystery Out of Mastery: A Response to Guskey, Anderson, and Burns." *Review of Educational Research* 57: 231-235.

Slavin, R.E. (1987c). "Making Chapter 1 Make a Difference." *Pbi Delta Kappan* 69: 110-119.

Slavin, R.E. (1987d). "Combining Cooperative Learning and Individualized Instruction." *Arithmetic Teacher* 35, 3: 14-16.

Slavin, R.E., and N.L. Karweit. (1984). "Mastery Learning and Student Teams: A Factorial Experiment in Urban General Mathematics Classes." *American Educational Research Journal* 21: 725-736.

Slavin, R.E., M.B. Leavey, and N.A. Madden. (1986). *Team Accelerated Instruction—Mathematics*. Watertown, Mass.: Charlesbridge.

Slavin, R.E., and N.A. Madden. (February 1989). "Synthesis of Research on What Works for Students at Risk." *Educational Leadership* 46, 5: 4-13.

Stallings, J., and E.M. Krasavage. (1986). "Program Implementation and Student Achievement in a Four-Year Madeline Hunter Follow-Through Project." *Elementary School Journal* 87: 117-138.

Walberg, H.J. (1984). "Improving the Productivity of America's Schools." *Educational Leadership* 41, 8: 19-27.

Robert E. Slavin is Director, Elementary School Program, Center for Research on Elementary and Middle Schools, The Johns Hopkins University, 3505 N. Charles St., Baltimore, MD 21218.

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