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Closing Achievement Gaps:

Revisiting Benjamin S. Bloom's "Learning for Mastery"

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Disparities or "gaps" in the achievement levels of different groups of students have concerned political and educational leaders for decades. President Lyndon Johnson's "War on Poverty" in the 1960s focused on inequities in the educational achievement of economically disadvantaged students and their more advantaged counterparts. The Economic Opportunity Act (EOA) of 1964, which established the Head Start program, and the Elementary and Secondary Education Act (ESEA) of 1965, which created the Title I and Follow Through programs, were specific attempts to address these gaps in educational attainment.

More recently, the No Child Left Behind (NCLB; 2001) legislation revived these concerns. This law requires schools to report achievement results separately for various poverty, ethnicity, language, and disability subgroups. If achievement gaps among these different subgroups of students are identified, then schools must take specific steps to close them.

Over the years, researchers have learned a great deal about identifying and reducing these achievement disparities. One of the most important contributors to that knowledge base was Benjamin S. Bloom (Guskey, 2006). Although known primarily for his pioneering work developing the *Taxonomy of Educational*

Summary

The problem of achievement gaps among different subgroups of students has been evident in education for many years. This manuscript revisits the work of renowned educator Benjamin S. Bloom, who saw reducing gaps in the achievement of various groups of students as a simple problem of reducing variation in student learning outcomes. Bloom observed that teaching all students in the same way and giving all the same time to learn—that is, providing little variation in the instruction—typically results in great variation in student learning. Students for whom the instructional methods and amount of time are appropriate learn well, and those for whom the methods and time are less appropriate learn less well. Bloom believed that all students could be helped to reach a high criterion of learning if both the instructional methods and time were varied to better match students' individual learning needs. In other words, to reduce variation in the achievement of diverse groups of students and have all students learn well, Bloom argued that educators and teachers must increase variation in instructional approaches and learning time. Bloom labeled the strategy to accomplish this instructional variation and differentiation *mastery learning*. Research evidence shows that the positive effects of mastery learning are not limited to cognitive or achievement outcomes. The process also yields improvements in students' confidence in learning situations, school attendance rates, involvement in class sessions, attitudes toward learning, and a variety of other affective measures.

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Objectives: The Cognitive Domain (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956), commonly labeled Bloom's Taxonomy, Bloom's later work on Learning for Mastery offered keen insights into the challenge of reducing gaps in the achievement of diverse groups of students.

The Contribution of Benjamin S. Bloom

In the 1960s, Bloom and his graduate students were engaged in a series of studies on individual differences in school learning. Although their evidence showed that many factors outside of school affect how well students learn (Bloom, 1964), Bloom was convinced that teachers have a potentially strong influence.

While observing classrooms, Bloom noted that teachers displayed very little variation in their instructional practices. Most teachers taught all of their students in much the same way and provided all students with the same amount of time to learn. Students for whom these instructional methods and time were ideal learned successfully. The largest number of students found these methods and time only moderately appropriate and learned somewhat less. Students for whom the instruction and time were inappropriate due to differences in their backgrounds or learning styles tended to learn very little. In other words, little variation in teaching resulted in great variation in student learning. Under these conditions, the pattern of student achievement was similar to the normal curve distribution shown in Figure 1.

To attain better results and reduce variation in student achievement, Bloom reasoned that teachers would have to increase variation in their teaching. Because students vary in their learning styles and aptitudes, Bloom suggested that educators at all levels must differentiate instruction to better meet their individual learning needs. The challenge was to find practical ways to do this within group-based classrooms so that all students learn well.

In searching for such a strategy, Bloom considered two different sources of evidence. First, he explored research on the

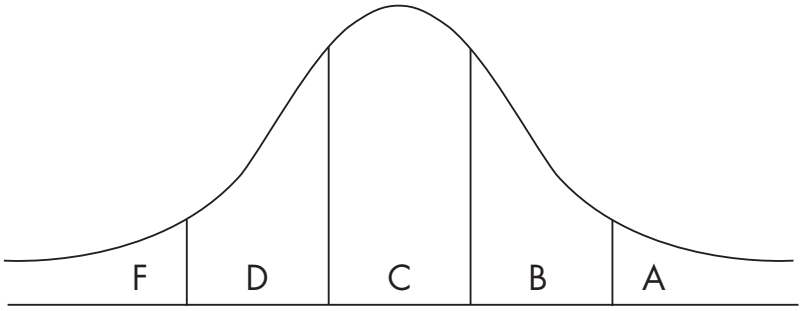

Figure 1. Distribution of achievement in traditional classrooms.

ideal teaching and learning situation in which an excellent tutor is paired with each student. Particularly impressive to Bloom was the work of early pioneers in individualized instruction, especially Washburne (1922) and his Winnetka Plan and Morrison (1926) and his University of Chicago Laboratory School experiments. In examining this evidence, Bloom tried to determine what critical elements in one-to-one tutoring and individualized instruction could be transferred to group-based classroom settings.

Second, Bloom looked at studies of the learning strategies of academically successful students, particularly the work of Dollard and Miller (1950). From this research he tried to identify the activities of high-achieving students in group-based classrooms that distinguish them from their less-successful classmates. Bloom saw value in the traditional practice of organizing the concepts and skills to be learned into instructional units. He also thought it vital for teachers to assess student learning at the end of each unit. But to Bloom, most teachers' classroom assessments did little more than verify for whom their initial instruction was and was not appropriate.

A far better approach, according to Bloom, is for teachers to use their classroom assessments as learning tools, both to provide students with feedback on their learning progress and to guide the correction of learning errors. In other words, instead of using assessments only as evaluation devices that mark the

end of a unit, Bloom recommended they be used as part of the instructional process to diagnose individual learning difficulties and to prescribe remediation procedures.

This is precisely what takes place when an excellent tutor works with an individual student. If the student makes an error, the tutor first points out the error (feedback) and then follows up with further explanation and clarification (correctives) to ensure the student's understanding. Similarly, academically successful students typically investigate the mistakes they make on quizzes and assessments. They ask the teacher about the items they missed, look up the answer in the textbook or other resources, or rework the problem or task so that they do not repeat those errors.

Bloom's Mastery Learning

Benjamin Bloom then outlined a specific instructional strategy to make use of this feedback and corrective procedure, labeling it *learning for mastery* (Bloom, 1968), and later shortening the name to simply *mastery learning* (Bloom, 1971a). To use mastery learning, teachers first organize the concepts and skills they want students to learn into instructional units that typically involve approximately 1–2 weeks of instructional time. Following initial instruction on the unit, teachers administer a brief formative assessment based on the unit's learning goals. Instead of signifying the end of the unit, however, this formative assessment is designed to give students information, or feedback, on their learning. It helps students identify what they have learned well to that point and what they need to learn better (Bloom, Hastings, & Madaus, 1971).

Teachers pair specific "corrective" activities for use in correcting learning difficulties with each formative assessment. The correctives typically are matched to each item or set of prompts within the assessment so that students need work on only those concepts or skills not yet mastered. In other words, the correctives are individualized. They may point out sources of information on

a particular concept, such as page numbers in the textbook or workbook, where that concept is discussed. They may identify alternative learning resources such as different textbooks, learning kits, alternative materials, DVDs, videos, or computerized instructional lessons. Or, they may simply suggest sources of additional practice, such as study guides, independent or guided practice activities, or collaborative group activities.

With the feedback and corrective information gained from formative assessment, each student has a detailed prescription of what additionally needs to be done to master the concepts or skills from the unit. This just-in-time correction prevents minor learning difficulties from accumulating and becoming major learning problems. It also gives teachers a practical means to vary and differentiate their instruction in order to better meet students' individual learning needs. As a result, more students learn well, master the important learning goals in each unit, and gain the necessary prerequisites for success in subsequent units.

When students complete their corrective work after a class period or two, Bloom recommended they take a second formative assessment. This second, parallel assessment covers the same concepts and skills as the first, but includes slightly different problems or questions. As such, it serves two important purposes. First, it verifies whether or not the correctives truly helped students overcome their individual learning difficulties. Second, it offers students a second chance at success and, hence, has powerful motivational value.

Bloom also recognized that some students perform well on the first assessment, demonstrating their mastery of the unit concepts and skills. For these students, the teacher's initial instruction was highly appropriate, and they have no need for corrective work. To ensure their continued learning progress, Bloom recommended that teachers provide these students with special enrichment or extension activities to broaden their learning experiences. Enrichment activities often are self-selected by students and might involve special projects or reports, academic games, or a variety of complex but engaging problem-solving tasks. Figure 2 illustrates this instructional sequence.

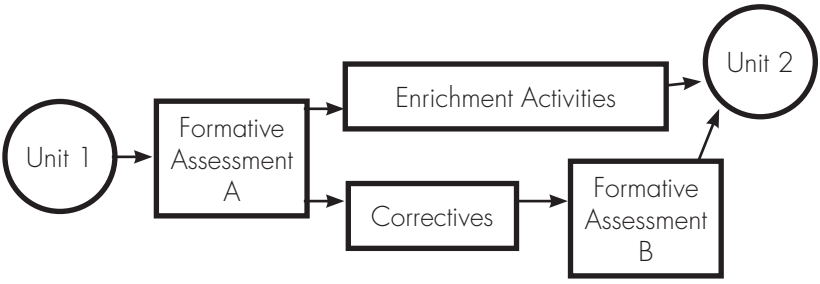

Figure 2. The mastery learning instructional process.

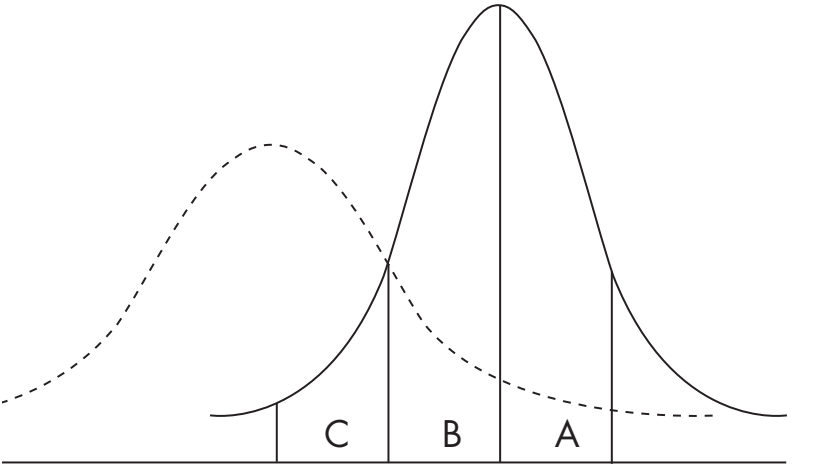

Figure 3. Distribution of achievement in mastery learning classrooms.

Through this process of formative classroom assessments, combined with the regular correction of individual learning errors, Bloom believed all students could be provided with more instruction than is possible under traditional approaches to teaching. As a result, nearly all students might be expected to learn well and truly master the unit concepts or learning goals (Bloom, 1976). This, in turn, would drastically reduce the variation in students' achievement levels, eliminate achievement gaps, and yield a distribution of achievement more like that shown in Figure 3.

In his descriptions of mastery learning, Bloom emphasized, however, that reducing variation in students' achievement does not imply making all students the same. Even under these more favorable learning conditions, some students undoubtedly will learn more than others, especially those involved in enrichment activities. But by recognizing relevant, individual differences among students and then adapting instruction to better meet these diverse learning needs, Bloom believed the variation among students in how well they learn specific concepts or master a set of well-articulated learning goals could eventually reach a vanishing point (Bloom, 1971b). In other words, all students would be helped to learn the knowledge and skills prescribed in the curriculum. As a result, gaps in the achievement of different groups of students would be closed.

Essential Elements of Mastery Learning

After Bloom described his ideas, numerous programs based on mastery learning principles appeared in schools throughout the United States and around the world (see Block, 1971, 1974; Block & Anderson, 1975; Hymel & Dyke, 1993; Reezigt, & Weide, 1990, 1992; Wu, 1994; Yildiran, 2006). Although they differ from setting to setting, those programs true to Bloom's ideas included two essential elements: (1) the feedback, corrective, and enrichment process; and (2) instructional alignment (Guskey, 1997).

Feedback, Correctives, and Enrichment

Teachers who use mastery learning provide students with frequent and specific feedback on their learning progress through regular, formative classroom assessments. This feedback is both diagnostic and prescriptive. It reinforces precisely what students were expected to learn, identifies what they learned well, and describes what needs to be learned better. The National Council of Teachers of Mathematics (NCTM; 2000) emphasized this

element in its latest iteration of the standards for school mathematics. To overcome inequities in mathematics instruction, NCTM stressed the use of assessments that support learning and provide useful information to both teachers and students. Ainsworth and Viegut (2006); Marzano (2003); Smith, Smith, and DeLisi (2001); and Stiggins (2008) similarly emphasized the vital nature of feedback from assessments for learning.

By itself, however, feedback does little to help students improve their learning. Significant improvement requires feedback to be paired with correctives: activities that offer guidance and direction to students on how to remedy their learning problems. Because of individual differences among students, no single method of instruction works best for all. To help every student learn well, therefore, teachers must differentiate their instruction, both in the initial teaching and especially through the corrective activities (Bloom, 1976). In other words, to decrease variation in results, teachers must increase variation in their teaching.

To be effective, correctives must be qualitatively different from the initial teaching. They should offer students alternative approaches and additional time to learn. The best correctives present concepts and involve students in learning differently than the initial instruction. They incorporate the varying learning styles, learning modalities, and types of intelligence represented by students. Developing effective correctives can prove challenging, of course. Many schools find, however, that providing teachers with time to work collaboratively, in which they share ideas, materials, and expertise, greatly facilitates the process (Guskey, 2001).

Most applications of mastery learning also include enrichment or extension activities for students who master the unit concepts from the initial teaching. As described earlier, enrichment activities offer students opportunities to broaden and expand their learning. They reward students for their learning success and challenge them to go further. Many teachers draw from activities developed for gifted and talented students when planning enrichment activities, both to simplify implementation tasks and to guarantee these students a high-quality learning experience.

Teachers implement the feedback, corrective, and enrichment process in a variety of ways. Many use short, paper-and-pencil quizzes as formative assessments to give students feedback on their learning progress. But formative assessments also can take the form of essays, compositions, projects, reports, performance tasks, skill demonstrations, oral presentations, or any other device used to gain evidence on students' learning progress. In essence, teachers adapt the format of their formative assessments to match their instructional goals.

Following a formative assessment, some teachers divide the class into separate corrective and enrichment groups. While the teacher directs corrective activities, guaranteeing that all students who need the extra time and assistance take part, the other students work on self-selected, independent enrichment activities. Other teachers pair with colleagues and use a team-teaching approach. One teacher oversees corrective activities while the other monitors enrichments. Still other teachers use cooperative learning activities in which students work together in teams to ensure all reach the mastery level. Because students have their own personal scores on the formative assessment, individual accountability is assured. Offering the entire team special recognition or credit if all students attain mastery on the second formative assessment encourages group responsibility (Johnson, Johnson, & Holubec, 1994).

Feedback, corrective, and enrichment procedures are crucial to mastery learning, for it is through these procedures that mastery learning differentiates and individualizes instruction. In every instructional unit, students who need extended time and opportunity to remedy learning problems receive these through the correctives. Students who learn quickly and find the initial instruction highly appropriate have opportunities to extend their learning through enrichment. As a result, all students experience more favorable learning conditions and more appropriate, higher quality instruction (Bloom, 1977). Similar elements provide the foundation for more recently developed instructional approaches including differentiated instruction (Tomlinson, 2003) and understanding by design (Wiggins & McTighe, 2005).

Managing Feedback, Correctives, and Enrichment

Some teachers fear that taking time for corrective and enrichment activities in each instructional unit will lessen the amount of material that they will be able to cover. In other words, they believe that they will have to sacrifice coverage to allow a higher level of learning and, as a result, "Some students may learn better, but all will learn less."

Corrective and enrichment activities initially do add time to instructional units. Teachers who provide class time for students to complete corrective activities often find themselves behind other teachers who teach in more traditional ways after the first two or three units. Especially in early units, these activities must be done in class, under the teacher's direction, and typically require a class period or two. Teachers who ask students to complete correctives outside of class as a homework assignment or during special study sessions held before or after school rarely experience success. Instead, they quickly discover that those students who could benefit most from the corrective process are the least likely to take part. Teachers who engage students in corrective activities in class, under their direction, however, help students gain direct evidence of the personal benefits the process offers. As a result, students develop increased confidence in learning situations and are more likely to undertake corrective activities on their own.

After students become accustomed to the corrective process and realize its advantages, most teachers begin reducing the class time they allocate to correctives. They use more student-initiated activities and ask students to complete more of their corrective work outside of class, often as homework. As students remedy their learning problems in early units, they perform better on formative assessments in subsequent units. This leads to more students becoming involved in enrichment activities and fewer engaged in correctives. The amount of corrective work students need in order to reach the proficiency standard also diminishes (Whiting, Van Burgh, & Render, 1995).

Modest changes in instructional format further lessen the extra time needed. Many teachers, for example, eliminate review sessions prior to formative assessments. Instead, they shift that time to the corrective and enrichment process. With the results from the formative assessment, teachers become more efficient in their reviews. Rather than reviewing everything, they can concentrate on only those concepts and skills that pose problems for students. In addition, by allowing fast learners to demonstrate their proficiency and move to enrichment activities, teachers can spend their time working with a smaller group of students who most need their assistance. With more students reaching the proficiency standard in each succeeding unit, most teachers also find that their instructional pace in later units can be more rapid.

In general, teachers do not need to sacrifice content coverage to implement corrective and enrichment activities, but they must be flexible in pacing their instruction. The time used for correctives and enrichments in early units yields powerful benefits that later will make things easier. This extra time can then be recouped in later units by spending less time on reviews and increasing the instructional pace. Teachers at all levels must keep in mind what needs to be accomplished by the end of any learning sequence, but they also must see students' pathways to that end in more flexible and accommodating terms.

Instructional Alignment

Besides feedback, correctives, and enrichment, one additional element is essential to mastery learning. Bloom stressed that reducing variation in student learning and closing achievement gaps further requires consistency among all instructional components. He labeled this instructional alignment (Bloom, 1971a).

Bloom believed three major components composed the teaching and learning process. To begin, there must be specific ideas about what students are expected to learn and be able to do; that is, learning goals or standards. Next comes instruction that, ideally, results in proficient learners—students who have learned well and whose proficiency can be assessed. Mastery learning

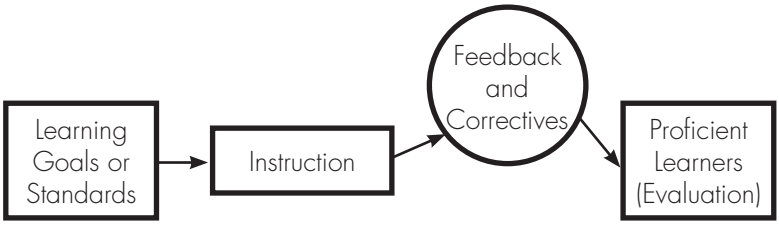

Figure 4. Major components in the teaching and learning process.

adds a feedback and corrective component, allowing teachers to determine for whom their initial instruction was appropriate and for whom an alternative approach may be needed.

Although essentially neutral with regard to what is taught, how it is taught, and how learning is assessed or evaluated, mastery learning requires consistency or alignment among these instructional components, as shown in Figure 4. For example, if students are expected to learn higher level skills such as those involved in making applications, solving complex problems, or developing thoughtful analyses, mastery learning stipulates that instructional activities must be planned to give students opportunities to practice and actively engage in those skills. It also requires that students be given specific feedback on how well they have learned those skills, coupled with directions on how to correct any learning errors. Finally, procedures for assessing or evaluating students' learning should reflect those higher level skills as well.

To ensure alignment among instructional components, teachers must make a number of crucial decisions. First, they need to decide what concepts or skills are most important for students to learn and most central to students' understanding. Teachers must determine, for example, if they want students to learn only basic skills, or if they want students to develop higher level skills and more complex cognitive processes. Second, teachers need to decide what evidence best reflects students' mastery of those basic or higher level skills. Critics sometimes challenge

teachers' abilities to make these crucial decisions. But, in essence, teachers at all levels make these decisions in conducting regular classroom activities. Every time they administer an assessment, grade a paper, or evaluate students' learning, teachers communicate to students what is most important to learn. Using mastery learning simply compels teachers to make these decisions more thoughtfully and purposefully.

Misinterpretations of Mastery Learning

Some early attempts to implement mastery learning were based on narrow and inaccurate interpretations of Bloom's ideas. These programs focused on only low-level skills; attempted to break learning down into small, patchy segments; and insisted that students master each segment before being permitted to move on. Teachers in these programs were regarded as little more than managers of materials and record keepers of student progress.

Nowhere in Bloom's writing, however, can this kind of narrowness and rigidity be found. In fact, Bloom emphasized quite the opposite. He considered thoughtful and reflective teachers vital to the successful implementation of mastery learning and continually stressed flexibility in its application. In his earliest description of the process, Bloom (1968) wrote:

> There are many alternative strategies for mastery learning. Each strategy must find some way of dealing with individual differences in learners through some means of relating instruction to the needs and characteristics of the learners. . . . Guiding students with respect to courses they should or should not take, providing different streams for different groups of students, the nongraded school, and alternative high school schedules are all attempts to provide an organizational structure that permits and encourages mastery learning. (pp. 7–8)

Bloom further emphasized his belief that instruction in mastery learning classrooms should focus on higher level learning goals, not simply basic skills. He noted:

> I find great emphasis on problem solving, applications of principles, analytical skills, and creativity. Such higher mental processes are emphasized because this type of learning enables the individual to relate his or her learning to the many problems he or she encounters in day-to-day living. These abilities are stressed because they are retained and utilized long after the individual has forgotten the detailed specifics of the subject matter taught in the schools. These abilities are regarded as one set of essential characteristics needed to continue learning and to cope with a rapidly changing world. (Bloom, 1978, p. 578)

Modern research studies have shown mastery learning to be particularly effective when applied to instruction focusing on higher level learning goals such as problem solving, drawing inferences, deductive reasoning, and creative expression (Arredondo & Block, 1990; Blakemore, 1992; Clark, Guskey, & Benninga, 1983; Kozlovsky, 1990; Mevarech, & Werner, 1985). When well implemented, the process helps teachers close achievement gaps in a broad range of learning goals from basic skills to highly complex cognitive processes.

Other misinterpretations come from secondary teachers who believed that the constraint of limited class time would inhibit their efforts to implement mastery learning (Guskey, 1997). They assumed that introducing feedback, corrective, and enrichment procedures would reduce the amount of material they would be able to cover. In other words, they would have to sacrifice coverage for the sake of mastery. But, as discussed earlier, minor alterations in instructional pacing typically resolve this concern. Because students in mastery learning classes spend a larger portion of their time actively engaged in learning, they make more rapid progress than students in more traditionally taught classes

(Arlin, 1973; Fitzpatrick, 1985). Further, because mastery learning students learn the concepts and skills from early units well, they are better prepared for later, more advanced units. Most teachers discover that with slight adjustments in the pacing of their instruction—slightly more time spent in early units but less time in later ones—they can cover just as much material using mastery learning, and in some cases more, as they were able to using more traditional approaches to instruction (Block, 1983; Guskey, 1983, 1987).

Research Results

Teachers generally find that implementing mastery learning requires relatively modest changes in their instructional procedures. Excellent teachers use many aspects of mastery learning in their classes already, and others discover that the process blends well with their current teaching strategies (Guskey, 1989).

Despite the modest nature of these alterations, however, extensive research evidence shows that using mastery learning can have exceptionally positive effects on student learning. A study by Whiting et al. (1995) representing 18 years of data gathered from more than 7,000 high school students showed mastery learning to have a positive influence on students' test scores and grade point averages, as well as their attitudes toward school and learning. Another field experiment conducted in elementary and middle school classrooms showed that the implementation of mastery learning led to significantly positive increases in students' academic achievement and their self-confidence (Anderson et al., 1992). Even more impressive, a comprehensive, meta-analysis review of the research on mastery learning concluded:

> We recently reviewed meta-analyses in nearly 40 different areas of educational research (J. Kulik & Kulik, 1989). Few educational treatments of any sort were consistently associated with achievement effects as large as those pro-

> duced by mastery learning. . . . In evaluation after evaluation, mastery programs have produced impressive gains. (Kulik, Kulik, & Bangert-Drowns, 1990, p. 292)

Developing procedures for feedback, correctives, and enrichments, and ensuring instructional alignment takes relatively little time and effort, especially if tasks are shared collaboratively among teaching colleagues. Studies consistently show, however, that deliberate implementation of these elements helps many more students learn well, significantly reduces variation in student learning outcomes, and closes gaps in the achievement of different groups of students at any level of education (Walberg, 1986). Some researchers even suggest that the superiority of Japanese students in international comparisons of achievement in mathematics operations and problem solving may be due largely to the widespread use in Japan of instructional practices similar to mastery learning (Nakajima, 2006; Waddington, 1995).

Research evidence shows that the positive effects of mastery learning are not limited to cognitive or achievement outcomes. The process also yields improvements in students' confidence in learning situations, school attendance rates, involvement in class sessions, attitudes toward learning, and a variety of other affective measures (Block & Burns, 1976; Guskey & Pigott, 1988, Whiting & Render, 1987). This multidimensional impact has been referred to as mastery learning's *multiplier effect*, and makes it an especially powerful tool in school improvement efforts.

Conclusion

Numerous factors influence student learning, many lying beyond classroom walls and outside of the control of educators. A recent Educational Testing Service report, for example, identified a wide range of environmental factors that may contribute to achievement gaps, the majority of which are external to schools (Barton, 2003). Denying the role of these outside influences will not endow teachers and schools with the capacity to

reduce achievement gaps, and efforts to address these home and community-based challenges must continue (Rothstein, 2004).

Nevertheless, the impediments to learning in students' environments outside of school should never become a basis for lowering expectations about what can be done to help them learn well in school. The feedback, correctives, enrichment process, and instructional alignment elements of mastery learning represent powerful tools that teachers can use to capitalize on the influence they have. They are not, of course, the only factors of importance. In his later writing, Bloom (1984a, 1984b, 1988) described exciting work on other ideas designed to attain results even more positive than those typically achieved with mastery learning.

Two of Bloom's doctoral students, Anania (1981, 1983) and Burke (1983), compared student learning under three different instructional conditions. The first was conventional instruction in which students were taught in group-based classes that included about 30 students and where periodic assessments were given mainly for the purposes of grading. The second was mastery learning, where students again were taught in group-based classes of about 30 students but were administered regular, formative assessments for feedback, followed by individualized corrective instruction and parallel second assessments to determine the extent to which they mastered specific learning goals. The third was tutoring, where a good tutor was paired with each student. Under tutoring, students also were administered regular formative assessments, along with corrective procedures and parallel second assessments, although the need for corrective work under tutoring was usually quite small.

The differences in students' final achievement under these three conditions were striking. Using the standard deviation (sigma) of the control (conventional) class as the measure of difference, Bloom's students discovered that:

> The average student under tutoring was about two standard deviations above the average of the control class (the average tutored students was above 98% of the students

> in the control class). The average student under mastery learning was about one standard deviation above the average of the control class (the average mastery learning student was above 84% of the students in the control class). . . . Thus under the best learning conditions we can devise (tutoring), the average student is 2 sigma above the average control student taught under conventional group methods of instruction. (Bloom, 1984a, p. 4)

Bloom (1984a) referred to this as the "2 Sigma Problem":

> The tutoring process demonstrates that *most* students do have the potential to reach this high level of learning. I believe an important task of research and instruction is to seek ways of accomplishing this under more practical and realistic conditions than the one-to-one tutoring, which is too costly for most societies to bear on a large scale. This is the "2 Sigma" problem. Can researchers and teachers devise teaching-learning conditions that will enable the majority of students under *group instruction* to attain levels of achievement that can at present be reached only under tutoring conditions? (pp. 4–5)

Bloom believed that attaining this high level of achievement would probably require more than just improvements in the quality of group instruction. Researchers and teachers might also need to find ways of improving students' learning processes, the curriculum and instructional materials, the home environmental support of students' school learning, and attention to higher level thinking skills. Nevertheless, careful attention to these elements of mastery learning allows educators at all levels to make great strides in their efforts to reduce variation in student achievement and close achievement gaps. These elements offer educators the tools needed to help students of different racial, ethnic, and socioeconomic backgrounds all learn excellently, succeed in school, and gain the many positive benefits of that success.

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