

## CHAPTER 1

# THE “WHY” OF MASTERY LEARNING

If you want to try an interesting experiment, walk into a third grade classroom, pick any child at random and, with the teacher’s permission, ask that child, “Would you please tell me who are the best students in this class?” Without hesitation, you will likely be told the names of one or two children. Then ask, “Can you then please tell me who are the slowest students in the class – the ones who have the most trouble learning?” Again, without hesitation, you will probably hear the names of one or two other children. Finally ask, “Suppose we put all the students in this class in order, from the best to the slowest, where would you stand?” After a slight pause, you will invariably get a fairly accurate estimate of that child’s relative standing among classmates.

That children in the third grade are able to give such accurate estimates of their academic standing is not particularly surprising to me, and may not be to you. Despite their small size and few years, third graders can be unusually clever. What troubles me deeply, however, is that this relative standing among third grade students doesn’t change much throughout their school years. In fact, research shows that achievement measured in third grade can be used to predict achievement in eleventh grade – eight years later – with 80 percent accuracy or better (Bloom, 1964; Casillas et al., 2012; Grimm, 2008; Siegler et al., 2012). All that seems to change is the relative distance between the highest and lowest achieving students in the class: each year that distance becomes greater.

As educators, we need to ask ourselves whether this high degree of predictability is an unavoidable characteristic of the educational process, or do we have other choices? Is such “determinism” in educational outcomes inevitable, or is there something we can do to alter these highly predictable results?

Consider, for example, if such predictability in results was true in the medical profession. Suppose you were feeling ill and visited a physician. And suppose that after examining you, the physician turned to you and said, “Well, all the evidence indicates that you’re sick. Too bad; you’re going to die. I can predict this with great accuracy.”

Few among of us would be satisfied with such a response. We expect physicians to do more than simply predict if we are likely to live or die. The task of those in the medical profession is to respond to health and medical problems. Certainly there are limitations to what they can accomplish. But success in medicine is

judged largely by the degree to which physicians can defy prediction – when they cure a disease that might otherwise have resulted in death, or heal an injury and prolong a life. Those in the medical profession are constantly looking for ways to intervene in biological processes specifically to defy prediction and guarantee a higher quality of health for *all* individuals.

Similarly in education, our task should be to find ways to respond to students' learning problems so that learning outcomes become much less predictable. Although there are also limitations to what we are able to accomplish, we too should be trying to defy prediction. We should be searching for ways to intervene in the educational process in order to guarantee a higher quality of learning for *all* students.

Every beginning teacher's goal is to have *all* students learn well. When they first enter the classroom or begin teaching in an online environment, beginning teachers generally feel confident that they can provide excellent instruction for *all* of their students. Their enthusiasm is boundless, and they strongly believe they will be able to reach *every* child with their teaching.

But within relatively short time, these ideas begin to fade. Some beginning teachers come to regard them as naive delusions. Psychological survival seems to compel beginning teachers to lower their sights (Harris, 2006; Pajak & Blase, 1989; Tschannen-Moran & Hoy, 2007). When asked a few years later about their classroom "successes," these now-seasoned teaching veterans typically name two or three students who became unusually excited about learning and made far greater progress than might have been expected or predicted. Such students, however, are the exceptions. They are not the rule. Furthermore, they generally represent a small minority of the hundreds of students a teacher might face.

The effects of the high degree of predictability in education and the seeming determinism in student learning outcomes are well known. A few students in each class consistently learn well and reach a high level of achievement. These students are recognized for their efforts, feel good about themselves, and develop a sense of pride and self-confidence. They generally like school, they like their teachers, and they like learning.

Many more students, however, consistently learn less well, receive little recognition, and develop a sense of inadequacy in learning situations. Often they begin to feel incapable of learning, or at least of school learning. These students thus become disadvantaged, disenfranchised, and ineffectual in a society where life success increasingly depends on the ability to learn. They fail to develop skills that are necessary for their survival and well-being in our increasingly complex world.

## DEFYING PREDICTABILITY

Over the years, research on teaching and learning has shown that there are, indeed, ways we can intervene in the educational process to defy the

predictability of learning outcomes. A number of studies have shown that when students are taught in ways that are appropriate for their needs and when they receive targeted help in overcoming individual learning difficulties, virtually *all* students learn well (Bloom, 1976, 1988; Darling-Hammond & Youngs, 2002, Harris, 1998; Hattie, 2009). Under these types of instructional conditions, learning outcomes become much less predictable. The level to which any student will learn cannot be predicted because of the strong influence of intervening instructional conditions.

Research studies also show that most teachers can provide appropriate instruction and can help students overcome their individual learning problems when they work with students in a one-to-one tutorial situation. When responsible for a single student, most teachers are able to help that student reach a very high standard of learning (Anania, 1981, 1983; Bloom, 1984a, 1984b; Elbaum et al., 2000). Unfortunately, that level of individual attention is rarely possible. In most school situations, learning takes place in classrooms or online where teachers are responsible for the learning of not one, but of twenty-five or more students. The problem thus becomes how to translate the elements of appropriateness and individualized help into classroom settings or online contexts where instruction and learning are typically group-based.

Regardless of their teaching level, virtually all teachers care deeply about the quality and appropriateness of their teaching. They know, for instance, that different students learn in *different ways*, and while one approach to instruction will be appropriate for some students, it is likely to be inappropriate for others. Teachers also know that students learn concepts and skills in *different order*, so while one sequence or “learning progression” (Mosher, 2011, Shepherd, 2018) may be appropriate for many students, it is unlikely to be optimal for all. Most teachers would like to provide more individualized help and assistance for their students. But the constraints and demands of the classroom and most online learning environments make such personalization hard to accomplish. When attending to the individual needs of one student, the needs of twenty-four or more others are left temporarily unattended and, as a result, engagement levels may diminish.

In addition, most programs designed to “individualize” or “personalize” instruction require that learning be student paced; that is, each student works at his or her own self-determined pace through a planned sequence of lessons. When students determine their own instructional pace, however, there is no guarantee that any but the most highly motivated, self-directed students with a strong sense of agency and self-regulation will learn essential concepts and skills within the time available (see Day & Connor, 2017). And because in many instances, mastery of particular concepts and skills at one level is necessary for success in the next higher level of learning, these students fall further and further behind. Together these management difficulties and curriculum issues make complete individualization and personalization extremely difficult and

impractical in most classroom or online contexts (Bangert et al., 1983; Horak, 1981; Rothrock, 1982; Kop, 2011).

If we want to alter the high degree of predictability in learning outcomes, we need an approach to teaching and learning that provides higher quality and more appropriate instruction along with more individualized help. At the same time, that approach must be sensitive to the demands and constraints of modern classroom and online learning environments. In other words, that approach must be applicable in the typical classroom settings where one teacher is responsible for the learning of twenty-five or more students, where the curriculum is well established, and where the instructional time is limited.

## MASTERY LEARNING PROVIDES A SOLUTION

For many teachers, the teaching and learning process known as *mastery learning* provides just such an approach. Mastery learning combines much of what we know about effective teaching and learning in a set of sound and useful instructional practices. These practices involve procedures for planning and organizing instruction, combined with strategies for providing students with regular feedback on their learning progress, and guidance in correcting individual learning difficulties. In essence, mastery learning provides teachers with a way to better individualize and personalize teaching and learning within group-based classroom or online environments.

Mastery learning is by no means an educational panacea. It won't solve all of the problems teachers face and certainly doesn't make teaching easier or less challenging. But in a wide variety of contexts, teachers find that mastery learning gives them a way to help many more of their students learn excellently. In essence, mastery learning allows teachers to have a stronger and more powerful influence on the learning of their students (Guskey, 1980, 1985; Ironsmith & Eppler, 2007; Whiting et al., 1994). It also gives teachers a way to break the traditional lockstep procedures of highly predictable learning outcomes.

Programs designed to help teachers implement mastery learning operate in schools throughout the world today and have been for many years. Large scale programs can be found in urban, suburban, and rural school districts throughout the United States (Anderson, 1994a b; Guskey, 2010; Benjamin, 1981; Fiske, 1980, Vickery, 1987), as well as in Asia (Hau-sut, 1990; Kim et al., 1969; Lai & Biggs, 1994; Wu, 1994), Australia (Chan, 1981), Europe (Dyke, 1988; Kazu et al., 2005; Langeheine, 1992; Mevarech, 1986, 1989, Mevarech, 1986; Postlethwaite & Haggarty, 1998; Reezigt & Weide, 1990, 1992) and South America (Cabezón, 1984). Some of these programs include hundreds of teachers and tens of thousands of students.

Several reasons account for mastery learning’s strong appeal among teachers in these school systems. Besides enhancing teachers’ influence on students’ learning, mastery learning helps teachers pass along the benefits of learning success to more of their students than ever before. Students who succeed in learning develop a sense of pride and well-being. They feel good about themselves and find school an enjoyable place to be. Successful students feel energized and are motivated to engage in higher levels of learning. They have confidence in themselves and are more assured in future learning activities. Successful students also have greater resilience and persist in learning activities even when faced with occasional setbacks. Under more traditional approaches to teaching, only a handful of students experience these positive benefits. But with mastery learning, teachers can help nearly all of their students gain these important advantages. As a result, these teachers feel more confident and more efficacious, even in challenging teaching situations (Appova & Arbaugh, 2018).

### Reasons for the Broad Appeal of Mastery Learning

1. It enhances teachers’ influence on students’ learning.
2. It helps teachers to pass along the benefits of learning success to more of their students.
3. It requires only minor changes in teachers’ instructional techniques.

Another reason for mastery learning’s broad appeal is that its use doesn’t require drastic changes in teachers’ instructional techniques. In fact, most teachers find that mastery learning blends well with their present teaching practices and can be easily adapted to differences in classes, students, and online learning contexts. The application of mastery learning is quite flexible. In most cases it can be used without any alteration in school policy, class scheduling, or classroom arrangements (Guskey, 2015).

## A RESURGENCE OF INTEREST

Although mastery learning has been around for several decades, interest in its implementation continues to grow. Most modern educational reform initiatives include aspects of mastery learning (Perlman & Redding, 2011; Zandvakili et al., 2018). In addition, every day more and more teachers discover how mastery learning gives them a more powerful influence on their students’ learning. Evidence of the effectiveness of mastery learning comes not from educational laboratories, but from actual classrooms at all education levels and in all parts of the world. In many instances, the improvement teachers see are quite remarkable (Anderson & Burns, 1987; Kulik et al., 1990, Siddaiah-Subramanya et al., 2017; Walberg, 1985; Whiting et al., 1995).

This growing enthusiasm about mastery learning has led some advocates to call for the immediate, large-scale implementation of these practices. But in most contexts, mastery learning programs expand at a more measured and incremental pace. Although some education leaders find this frustrating, considering the basic nature of most mastery learning programs shows why.

Experience has taught teachers and school leaders alike to be wisely cautious of new ideas and educational innovations. Education is flooded with innovations that may be intuitively appealing and theoretically sound, but have little or no practical utility in the classroom or in online learning contexts. In fact, many of educational innovations actually create more problems for teachers than they help to solve. For this reason, most teachers begin mastery learning programs on a tentative, small-scale basis and expand their efforts only after verifying successful results. When they confirm a positive impact and validate credibility, serious efforts to broaden implementation begin.

Another reason for mastery learning's relatively slow expansion is that it's not simply a package of educational materials that can be bought or downloaded and then applied in the classroom or online. *Mastery learning is a teaching and learning process.* It involves instruction that is carefully planned with consideration of students' needs, together with procedures for identifying and then correcting students' individual learning difficulties. Expansion of this kind of process is bound to occur at a more gradual and measured pace than would an innovation that depended only on the dissemination and use of materials.

Certainly, the implementation of mastery learning can be facilitated with online guidance and the dissemination of carefully developed educational materials. In fact, several online vendors and commercial publishers have fashioned their instructional materials in a format directly aligned with mastery learning, including *Google Classroom* (Azhar & Iqbal, 2018; ftakhar, 2016) and the Khan Academy (see Kronk, 2018). Many teachers find these resources especially useful. In addition, the curriculum staffs of many school districts have developed instructional frameworks to aid teachers in planning and organizing materials for implementing mastery learning. Other school systems employ teams of experienced mastery learning teachers to serve as coaches and mentors in order to simplify implementation efforts.

## THE GRADUAL IMPLEMENTATION OF MASTERY LEARNING

Although online resources and instructional frameworks help in the initial use of mastery learning, the most vital element in successful implementation remains individual teachers' thoughtful and sensitive application of the mastery learning process. Even with materials and resources organized in a mastery learning format, teachers must still critically review those materials, judge their appropriateness, and make changes or additions to them to match the needs of their students. No

set of online resources or collection of instructional materials is teacher-proof. None can be indiscriminately applied in classrooms or in online settings and result in successful learning on the part of all students. As Murnane (1981) stressed, “A necessary condition for effective teaching may be that teachers adapt instructional strategies and curricula to their own skills and personalities, and to the skills, backgrounds, and personalities of their students” (p. 26).

Critical judgment, sensitivity, and individual adaptation by teachers are essential for the successful implementation of mastery learning, just as they are for any approach to teaching and learning. The ideas presented in this book are specifically designed to aide teachers engaged in the important task of making those judgments and adaptations.

As we indicated earlier, mastery learning is not an educational cure-all. Neither is it the most ideal of all instructional conditions. If resources were available to pair every student with an excellent tutor, undoubtedly *all* students would learn well and attain a high level of achievement. But we simply don’t have those kinds of resources. We will never be able to reduce class size to one!

Nevertheless, many teachers find that with mastery learning, they can come a little closer to offering students that ideal. Most teachers discover that through the use of mastery learning, they can have a more positive and more powerful influence on learning, regardless of the characteristics of their students. They can better pinpoint students’ individual learning problems and help students overcome those difficulties, thus altering the lockstep procedures that lead to highly predictable learning outcomes. While mastery learning doesn’t offer a solution to *all* of the problems teachers face, it does provide a set of useful ideas and practical techniques that teachers can use to help many more of their students succeed in learning and thus gain the many positive benefits of that success.

## SUMMARY

Mastery learning is a teaching and learning process that allows teachers better individualize and personalize instruction within group-based classroom and online settings. It helps teachers carefully plan their instruction to meet the unique learning needs of their students, combined with procedures for identifying and then correcting students’ individual learning difficulties. To successfully implement mastery learning, however, teachers must adapt these procedures to their classroom or online context and to the characteristics of their students. When implemented well, mastery learning can be a powerful tool for teachers in their efforts to have all of their students learn excellently and realize the many benefits of learning success.

## QUESTIONS FOR DISCUSSION

1. How early in their school career do you believe students develop perceptions of school and of themselves as learners? How accurate are those perceptions? How much do those perceptions change? What do you believe are the consequences? Do you believe those perceptions can be changed?
2. Do you recall the hopefulness and optimism you had when you first began teaching? Has that changed? If it has, what caused the change? What are your thoughts as you reflect on that change? Do you believe that hopefulness and optimism can be recaptured?
3. The best teachers are usually not very good at predicting the learning outcomes of their students. Why might that be so? Do you have a different perspective?
4. Some educators contend that students must believe they can be successful in school in order to achieve success. Others argue that experiencing success is what prompts students to believe they can succeed. What do you believe? What experiences led you to develop your beliefs?

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