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Lessons of Mastery Learning

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The core elements of mastery learning provide the foundation for other innovative models, including Response to Intervention.

Every year, educators are inundated with demands to implement new instructional interventions, all promising to improve student learning. It can be difficult, however, for school leaders to verify these claims. Under pressure to make improvements, many schools simply proceed with implementation, hoping against the odds that the promised results will materialize.

Fortunately, many innovations include elements of more established strategies for which evidence of positive effects *does* exist. Among these research-supported strategies, one of the most powerful is mastery learning. Few strategies have been implemented as broadly or evaluated as thoroughly during the last 40 years. The core elements of mastery learning also provide the foundation for many innovations and interventions that teachers are implementing in classrooms today.

How Mastery Learning Works

Most current applications of mastery learning stem from the work of Benjamin S. Bloom (1971, 1976, 1984), who considered how teachers might adapt the most powerful aspects of tutoring and individualized instruction to improve student learning in general education classrooms. Bloom suggested that although students vary widely in their learning rates and modalities, if teachers could provide the necessary time and appropriate learning conditions, nearly all students could reach a high level of achievement.

Bloom observed that teachers' traditional practice was to organize curriculum content into units and then check on students' progress at the end of each unit. These checks on learning progress, he reasoned, would be much more valuable if they were used as part of the teaching and learning process to provide feedback on students' individual learning difficulties and then to prescribe specific remediation activities.

Bloom outlined a strategy to incorporate these feedback and corrective procedures, which he labeled *mastery learning* (Bloom, 1971). In using this strategy, teachers organize the important concepts and skills they want students to acquire into learning units, each requiring about a

week or two of instructional time. Following high-quality initial instruction, teachers administer a *formative* assessment (Bloom, Hastings, & Madaus, 1971) that identifies precisely what students have learned well and where they still need additional work. The formative assessment includes explicit, targeted suggestions—termed *correctives*—about what students must do to correct their learning difficulties and to master the desired learning outcomes.

When students complete their corrective activities (after a class period or two), they take a second, parallel formative assessment that addresses the same learning goals of the unit but includes somewhat different problems, questions, or prompts. The second formative assessment verifies whether the correctives were successful in helping students remedy their individual learning difficulties. It also serves as a powerful motivational tool by offering students a second chance to succeed.

Along with the corrective activities, Bloom recommended that teachers plan enrichment or extension activities for students who demonstrate their proficiency on the first formative assessment. Enrichment activities give these students exciting opportunities to broaden and expand their learning.

Bloom believed that nearly all students, when provided with the more favorable learning conditions of mastery learning, could truly master academic content (Bloom, 1976; Guskey, 1997a). A large body of research has borne him out: When compared with students in traditionally taught classes, students in well-implemented mastery learning classes consistently reach higher levels of achievement and develop greater confidence in their ability to learn and in themselves as learners (Anderson, 1994; Guskey & Pigott, 1988; Kulik, Kulik, & Bangert-Drowns, 1990).

Elements Mastery Learning and Other Interventions Share

The following core elements of mastery learning are evident in many more recently developed instructional models and interventions. Research has consistently linked these elements to highly effective instruction and student learning success (Guskey, 2009; Marzano, 2009; Rosenshine, 2009).

Diagnostic Pre-Assessment with Preteaching

Most mastery learning models stress the importance of administering a quick and targeted pre-assessment to all students before beginning instruction to determine whether they have the prerequisite knowledge and skills for success in the upcoming learning sequence. Some teachers pre-assess students orally by asking them about previous learning experiences or understandings; others use short surveys or quizzes. For students whose preassessment results suggest deficiencies, mastery learning teachers take time to directly teach them the needed concepts and skills. In other words, teachers ensure the conditions for success before instruction begins.

Leyton (1983), a student of Bloom, studied the effects of teaching identified prerequisite skills to entering students. He began by administering a short pre-assessment to all students to measure the knowledge and skills that teachers considered essential for learning success in their

high school classes. In half of the classes, teachers used the pre-assessment results to help students identify and then review the prerequisite concepts and skills they did not possess. In the other classes, students began learning new material immediately, but at a slower pace.

After nine weeks of instruction, students in the classes that had reviewed the missing prerequisite concepts and skills were far more likely to have achieved mastery, measured by 80 percent or more correct on a cumulative, summative examination. Because Leyton's study was conducted in only a few subject areas (mathematics and foreign language) and under tightly controlled conditions, these results must be cautiously interpreted. Still, when viewed in light of similar research (Deshler & Schumaker, 1993; Vockell, 1993), the results demonstrate the potential benefit of relatively brief preteaching for students whose prerequisite knowledge and skills are weak or deficient.

Mastery learning's diagnostic assessment is similar to the idea of universal screening in Response to Intervention (RTI) models (Mellard & Johnson, 2008). Most descriptions of RTI stress the importance of initiating the instructional process with a targeted assessment of all students that is quick, inexpensive, and focused on crucial knowledge, skills, and behaviors. This universal screening helps teachers identify students who are at risk of learning difficulties and are likely to require especially close monitoring during the instructional process.

High-Quality, Group-Based Initial Instruction

Every description of mastery learning, as well as other interventions such as Understanding by Design (UbD) and RTI, emphasizes the importance of engaging all students in high-quality, developmentally appropriate, research-based instruction in the general education classroom. UbD (Wiggins & McTighe, 2005) includes a toolbox of instructional approaches for obtaining the desired results from initial instruction. In many RTI models, this is considered the first level of intervention, also called Tier 1 or primary prevention (Fuchs & Fuchs, 2006). Such instruction should be multifaceted; adapted to the context; tied to students' interests and experiences; and differentiated according to the knowledge, skills, dispositions, and background characteristics of students (Astleitner, 2005; Conroy, Sutherland, Snyder, & Marsh, 2008).

Progress Monitoring Through Regular Formative Assessments

Another element of mastery learning that many other interventions share is the use of regular formative assessments to systematically monitor student progress and give students prescriptive feedback (Hattie & Timperley, 2007). These brief classroom assessments measure the most important learning goals from an instructional unit and typically are administered after a week or two of instruction. They reinforce precisely what students were expected to learn, identify what they learned well, and describe what they need to learn better.

Formative assessments vary in form depending on the subject area, the grade level, and the learning outcomes involved. They may be short quizzes, written assignments, oral presentations, skill demonstrations, or performances. In essence, formative assessments are any device teachers use to gather evidence of student learning.

Formative assessments provide the basis of all programs that emphasize assessment "for" learning, as opposed to assessment "of" learning (Stiggins, 2009). Most RTI models refer to this component as *progress monitoring*. In many RTI classrooms, progress-monitoring assessments are administered weekly, although they may be more frequent, depending on the subject area and nature of the class.

High-Quality Corrective Instruction

It would be foolish to charge ahead knowing that students have not learned key concepts or skills well. Following formative assessments, therefore, mastery learning teachers provide high-quality corrective instruction designed to remedy whatever learning problems the assessments identified.

High-quality corrective instruction is not the same as "reteaching," which often consists simply of restating the original explanations louder and more slowly. Instead, mastery learning teachers use corrective instruction approaches that accommodate differences in students' learning styles, learning modalities, or types of intelligence (Sternberg, 1994). Some teachers engage students in peer tutoring or cooperative learning groups. Others use paraprofessional instructional aides.

In mastery learning classes, corrective activities typically add about 10–20 percent more time to initial learning units (Block, Efthim, & Burns, 1989). For a unit of a week or two in length, for example, corrective instruction might last one or two days. Bloom (1974) argued, however, that intense, individualized assistance offered early in an instructional sequence would drastically reduce the time needed for remediation in later units. Because corrective instruction guarantees that students have the learning prerequisites for subsequent units, initial instruction in later units can proceed more rapidly, allowing teachers to cover just as much material as they would using more traditional methods (Guskey, 2008).

Providing instructional alternatives based on differences in students' learning styles or modalities is the basis of differentiated instruction (Tomlinson, Brimijoin, & Narvaez, 2008). In the RTI model, mastery learning's corrective instruction may be referred to as Tier 2 intervention or secondary prevention (Fuchs & Fuchs, 2006). Like corrective instruction, this intervention usually takes place in the general education classroom but may be directed by another teacher or instructional aide.

Both corrective instruction and Tier 2 intervention emphasize the use of small-group instruction with individualized assistance organized according to the needs and skill level of the students involved. Both also stress that instruction at this level must be qualitatively different from the initial instruction, offering students an alternative approach and additional time to learn.

Second, Parallel Formative Assessments

In mastery learning, assessments are not a one-shot, do-or-die experience; instead, they are part of an ongoing effort to help students learn. So after corrective activities, mastery learning teachers give students a second, parallel formative assessment that helps determine the effectiveness of the corrective instruction and offers students a second chance to demonstrate mastery and experience success. RTI similarly requires frequent assessment of student learning

progress to check on the effectiveness of intervention strategies.

Mastery learning teachers make a point of recognizing those students who do well on the initial formative assessments. But they also acknowledge that students who do well on the second formative assessment have learned just as much and deserve the same grades as those who scored well on their first try.

The driver's license examination offers a comparable example. Many individuals do not pass their driver's test on the first attempt. On the second or third try, however, they may reach the same high level of performance as others did on their first. Would it be appropriate to restrict these drivers, for instance, to driving in fair weather only? In inclement weather, should they be required to pull over and park until the weather clears? That would be ridiculous. Because they eventually met the same high performance standards as those who passed on their initial attempt, they receive the same privileges. The same should hold true for students who engage in corrective activities and eventually show that they, too, have learned well.

Enrichment or Extension Activities

Mastery learning teachers also offer effective enrichment activities that provide valuable, challenging, and rewarding learning experiences for learners who have mastered the material and do not need corrective instruction. These activities should enable successful learners to explore in greater depth a range of related topics that keenly interest them but lie beyond the established curriculum. Many teachers draw from activities developed for gifted and talented students when planning enrichment activities, including challenging academic games and exercises, various multimedia projects, and peer tutoring (Whiting, Van Burgh, & Render, 1995). They are also a part of classrooms implementing differentiated instruction (Tomlinson, 2006).

Students engaged in enrichment activities gain valuable learning experiences without necessarily moving ahead in the instructional sequence. This makes it easier for other students who have been doing corrective work (or Tier 2 intervention in an RTI model) to resume their place in the regular instructional sequence when they are done. Otherwise, they would be placed in the impossible situation of having to remedy problems from the past while trying to keep up with the new concepts and skills presented in subsequent units.

The challenge for teachers in implementing enrichment or extension activities is to ensure that these activities engage students in truly valuable learning experiences. Having successful learners simply bide their time, doing more, harder problems or completing busywork while others are engaged in corrective instruction would be highly inappropriate. Enrichment activities must provide these students with opportunities to pursue their interests, extend their understanding, and broaden their learning experiences.

Sustaining and Extending Success

Researchers today generally recognize the value of the core elements of mastery learning. As a result, fewer studies are being conducted on the mastery learning process itself. Instead, researchers are looking for ways to attain even more impressive gains by improving students'

learning processes, curriculum and instructional materials, and the home learning environment and support and providing a focus on higher level thinking skills. Work on integrating mastery learning with other innovative strategies appears especially promising (Guskey, 1997b).

As we strive to improve achievement even further, we can continue to learn from the core elements of mastery learning. Attention to these elements will enable educators to make great strides in their efforts to close achievement gaps and help all students achieve excellence.

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