

largest proportion of space and attention is devoted to the problems of specifying objectives and creating tests. Teachers are instructed to use their current materials and methods for initial instruction. Discussions of remediation are vague, with the provision of textbook page numbers for student self-help being the typical concrete suggestion. In the Chicago program, *instruction* is the focus. Teachers are, of course, provided with formative tests with pre-specified mastery levels for each instructional unit. But more important, they are provided with instructional materials: detailed and structured teaching activities for presenting the instructional narrative and learning cues; corresponding learning activities that allow the pupils to practice the skills in the formats in which they will be evaluated; and self-contained, corrective, instructional exercises that provide alternative learning cues and additional practice opportunities.

Learning from Experience

We didn't begin our work with this design in mind. In fact we started, like most mastery learning projects, by attempting to create formative tests and instructional correctives that would be used in conjunction with a commercially-published textbook. The problem was that the method didn't work; teachers had trouble organizing materials into sequences of instructional activities; too many pupils failed the formative tests; and remediations became multiple, unwieldy, and overly time-consuming. As a result, we began again, developing and simultaneously field

testing our own instructional materials. We used Bloom's general descriptions of successful mastery learning instruction as our field test criteria. If a given sequence of instructional activities did not lead 60 to 80 percent of the pupils to mastery, we modified it. If a learning unit proved to be too long, we split it up. If a remediation did not lead pupils to mastery, we redesigned it. These practices are in sharp contrast to the widespread method reported by Terwilliger (1979) of simply lowering the mastery level in order to allow more students to attain mastery.

Success was our criterion. Successful mastery learning instruction is supposed to lead to successful learning outcomes. When that doesn't happen, it is not mastery learning, even if the teacher has used a diagnostic test and attempted corrective instruction. Therefore, we used the formative test data to assess the effectiveness of the instructional activities we had provided, modifying them until we obtained the expected results. In this way, we took responsibility for demonstrating the validity of mastery learning theory to both teachers and pupils, as well as to ourselves.

The basic assumption of mastery learning—that all children can learn—is not a truth in the school experience of most teachers and pupils. They are not predisposed to believe. However, when our pilot classrooms began to experience successful learning, when both teachers and pupils *perceived* and *believed* the success, a transformation occurred. Teachers reported that classroom disruptions decreased as pupils more eagerly and actively participated in the learning activities. Pupils “pushed” teachers, mastering units

The Chicago Plan: Mastery Learning in the Chicago Public Schools

It has frequently been said that education is an enterprise dominated by fads. Before we can really integrate a set of principles and procedures into our instructional system, a new set of ideas captures our imagination. “Mastery learning” could be one such vogue. However, the difference between a fad and an effective instructional innovation is not a function of the underlying ideas, but rather is related to the extent to which the school system is committed to the ideas. Over the last few years, we in Chicago have been developing and implementing a comprehensive reading program based on the ideas of mastery learning. This program involves the entire school system, from board chambers to classroom, in a unified program of curriculum, instruction, evaluation, and management.

1. *A Continuous-Progress Curriculum.* The foundation of the program is the curriculum: a continuous sequence of 1,400 instructional objec-

tives. The *Curriculum Guides* in reading define the skills from kindergarten through the end of elementary school in four strands: word attack, study skills, comprehension, and literature. The objectives are grouped into 13 different reading levels, and objectives are hierarchically sequenced between levels. These instructional levels of the curriculum serve as the organizational basis for instruction because schools are ungraded, and students are grouped homogeneously by age and reading level.

2. *Criterion-Referenced Testing Program.* Of the total sequence of objectives, 273 have been identified as “key” or terminal objectives, and we have developed a set of criterion-referenced tests to evaluate mastery of these specific objectives. In every classroom in the city, pupils demonstrate successful learning by performing at or above pre-specified mastery levels (usually 80 percent) on these individual tests. Pupils must

far faster than expected, and teachers began to indicate acceptance of the basic premise of mastery learning.

Observations

What we observed were the effects of success: changes in attitude and behavior exhibited by both teachers and pupils as they experienced successful teaching and learning. We have come to believe that this experiencing of success is the basic phenomenon of mastery learning. The formative tests and instructional correctives are just some of the tools we use to achieve it. In the Chicago reading program, we have welded together a variety of features and elements into a single instructional package designed to build success into the learning unit. We would like to share some rather unsystematic observations about specific features of our program that illustrate how we promote success and how we help teachers and pupils be aware of it.

1. *Instructional format:* The basic design of the instructional activities is based on the simplest interpretation of Bloom's "cues" and "participation." In our instructional units, there is a sequence of from two to four instructional activities, each including a structured teaching presentation and an accompanying worksheet for practice. These differ from basal reader activities and workbooks primarily in the sequencing and in the regular alternation of teaching and practice activities. We have observed a number of advantages to this format. By breaking the instruc-

tional sequence into discrete activities, we give the teacher more accurate control of pace and progress. Activities can be lengthened or shortened as the teacher deems appropriate, and progress to the next activity occurs only when the teacher is satisfied that pupils have mastered the current activity. Furthermore, both teachers and pupils respond to the very perceptible progress from activity to activity. Finally, the connection of presentation to worksheet to following presentation seems to increase the effective time on task in both activities.

2. *Instructional sequencing:* The most difficult problem we confronted was the basic problem of instruction: the lack of cognitive prerequisites. No matter how homogeneously the class is grouped, some pupils in the group always seem to lack some prerequisites to the learning unit. And while diagnosing and remediating individual deficiencies is impractical, ignoring them is foolhardy.

Our solution was to design learning units that begin with activities requiring few prerequisites. As explained in Figure 1, these are activities that involve little or no reading, that are teacher directed and untimed, that have simple, concrete content, and that provide for structured response (such as multiple choice questions).

This arrangement of discrete activities gradually ascending in difficulty has tremendous benefits. Both pupils and teachers can observe visible progress as the class moves through the activities; each one is slightly different and each represents a reasonably increased demand over the previous exercise. The

show mastery on at least 80 percent of the tests within a reading level in order to progress to subsequent levels.

3. *Administrative Goals.* Many school systems are implementing instructional management systems to help administrators pace and monitor pupil progress. In Chicago, we have adopted the "Plan for Improvement in Reading," which differs from many other plans in that it is based on the objectives of the reading curriculum and is an integral part of the instructional program. Individual goals have been established in terms of the numbers of objectives mastered in each school term for each of the 13 reading levels. Teachers record pupil mastery of objectives on a goal chart, and they review these bi-weekly with principals. In this way, individual and classroom problems can be identified and remediated before instructional time is lost. Similarly, building goals have been established in terms of the numbers of

pupils who are reading "on level," and progress toward these goals is reviewed regularly by the district administrator.

4. *Mastery Learning Instructional Materials.* In order to help teachers and pupils reach the learning goals that have been established, we have been developing, testing, and implementing our own mastery learning instructional system, based specifically on our continuum of objectives. This system consists of a series of "learning packets" that includes all the materials necessary for conducting mastery learning instruction: structured teaching activities, corresponding pupil practice activities, formative tests to identify those who need further work on the objectives, and self-contained, corrective instructional exercises for those who fail to reach mastery on the initial effort. In addition, we have developed *TU-READ* tutorial materials to provide still further instruction and practice for those who require it. With

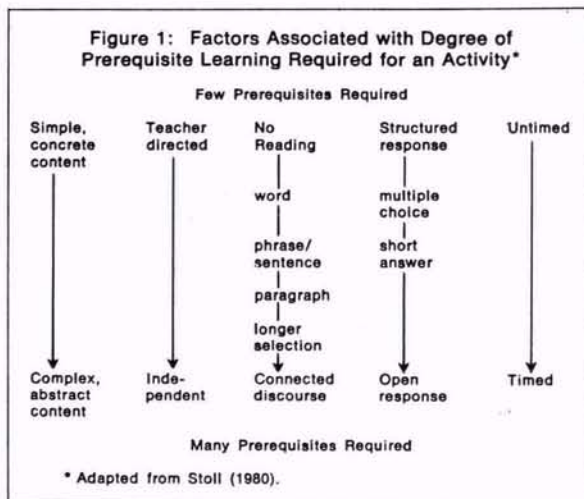
Joseph P. Hannon, assisted by Michael Katims

instructional supports help the pupil get involved in the instruction, after which they are gradually withdrawn as the pupil no longer needs them.

3. *Learning strategies:* One of the features of our curriculum that helps promote achievement is that in addition to teaching reading skills, our units teach specific learning strategies. As we observed pupils working with the criterion-referenced tests in reading, we saw that the tests required not only language skills, but cognitive skills as well. So we began to teach specific strategies for organizing memory, facilitating comprehension, and approaching problems. For younger pupils, these strategies and procedures are modeled in the instructional presentation. In the materials for upper elementary pupils, they are specifically taught. The instruction focuses explicitly on the higher cognitive skills, promoting development of what Bloom calls "learning to learn." Pupils are taught how to think about the problem and thus gain confidence to confront new learning situations.

4. *The formative test:* We found that the most critical aspect of the formative test is that it be perceived and accepted by teachers and pupils as *fair*. When the instructional sequence had prepared stu-

dents adequately for the test, and when the test results corresponded to the shared expectations of the class, the formative test was perceived as a non-



threatening feedback tool. Pupils actually asked to take it to find out if they had mastered the objectives,

Hannon (continued)

this instructional system, teachers are able to diagnose and correct learning errors as they occur, thereby helping the large majority of their pupils to achieve mastery.

5. *Competency-Based Promotion Policy.* In an effort to ensure that entering high school students are prepared for secondary level instruction, many school systems are attempting to upgrade their promotion standards. However, because the criteria are usually stated in terms of norm-referenced test scores, independent of the instructional program, these efforts are often seen as punitive, designed to exclude certain groups of students from high school. In Chicago, promotion to high school has been linked to progress through the matrix of reading objectives. The promotion policy specifies that pupils who have not mastered 80 percent of the objectives in each of the 13 reading levels shall be retained in elementary school for an additional year. Students who have not reached the graduation criteria after their eighth year are allowed to attend a mastery learning summer reading review. But in order to go on to high school, students must demonstrate an acceptable level of mastery on a selection of the criterion-referenced tests. Thus, the Chicago promotion policy is an integral part of the reading program, extending the basic principles of mas-

ttery learning by providing additional instruction and learning time to those pupils who need it.

It is far too soon to state that we have "solved" the reading problem in Chicago. Though our test scores have risen continuously in each of the last four years, our city norms are still well below national norms, and many of our children are reading one or two years below level. But this is to be expected. The continuous progress/mastery learning program has not as yet been fully implemented. The instructional materials will not be completed for all reading levels until a year from now, and other components, such as the record keeping system, are still being revised to meet the needs of teachers and principals.

What can be stated unequivocally is that the Chicago Public Schools are committed to the philosophy and the techniques of mastery learning. We believe that *all* children can learn and that it is our responsibility to help them to do so. Furthermore we believe that the techniques of mastery learning, particularly the use of instructional feedback and correctives, can help us fulfill our responsibility and to consolidate the many administrative and instructional aspects of schooling into a single, comprehensive program that mobilizes administrators, teachers, and pupils towards a common goal: successful learning achievement.

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