

Designing A Mastery Learning Program

Jerry W. Klein



Staff members interested in mastery learning can follow a four-step process for designing their own program.

The notion of mastery learning has a great deal of appeal for most educators. Few teachers or administrators would disagree with the idea that instructional programs should be designed with the intention that all students will learn. The difficulty lies in the organizational and management aspects of implementing the idea.

Block and Anderson (1975) have provided suggestions for one way to implement mastery learning,

but there are a variety of other ways to do it. A major task of a school staff interested in developing a program is to design their own model of mastery learning. They may find it helpful to proceed in four steps: (a) deriving the program standards; (b) selecting the pattern of instruction; (c) selecting the forms of instruction; and (d) deriving the instructional programming procedures.

Program Standards

The first step is to ensure that all concerned understand and agree upon what is meant by "mastery learning" and what its implications are for instruction. Block (1971), Bloom (1976), and Carroll (1963) have provided elaborate discussions of mastery learning, and their works should be carefully analyzed and openly discussed by the staff. The process of coming to an understanding and consensus can be formalized by identifying assumptions on which the program will be based and then specifying the assumptions as program standards. Program standards are defined here as statements that specify qualitative characteristics of the program. For example, one assumption of mastery learning is that all students can learn if they are provided appropriate amounts of time. The corresponding program standard might be stated as: "The program provides a way for students to have varying amounts of time to learn each skill." Another standard might be: "Assessment of student learning is based on individual achievement of specific objectives." This standard would be derived from the assumption that most learning can be specified in terms of observable performance (which, I might add, is a source of argument among some educators).



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In deriving program standards, the staff should consider the literature pertaining to a variety of relevant educational concepts including competency-based education, individualized instruction, and open education.¹ The staff should determine the assumptions associated with these concepts, select those assumptions with which they agree, and then translate them into program standards. At the end of this step, the staff should have a list of statements that specify what they are trying to accomplish. How to meet the standards is the concern of the remaining steps in the design process.

Patterns of Instruction

Before the staff gets involved in details of deciding how to organize, manage, and conduct instruction, they should formulate a basic pattern of instruction. The term "pattern of instruction" was used by Edling (1971) to indicate differences in programs with respect to who makes decisions regarding the selection of objectives and instructional activities. These patterns, depicted in Figure 1, provide an excellent starting point for conceptualizing a mastery learning program.

The most structured pattern of instruction is the individually diagnosed and prescribed pattern. It is most commonly used in subjects involving basic skills in which student achievement is highly dependent upon learning skills in a given sequence. The self-directed pattern may be used for sequential learning of skills, but it is less structured in that students are permitted to select instructional activities. For subjects or portions of subjects in which sequence is not critical, the personalized and independent study patterns are sometimes used. In these two patterns, the teacher usually serves as an advisor to the student in determining appropriate goals.

In selecting the patterns of instruction, the staff should consider using a combination of patterns. For example, some teachers prefer to begin students with the diagnosed/prescribed pattern for basic skills and the personalized pattern for facilitating the development of "thinking abilities." At a later time, the teacher gradually moves students into the self-directed and independent study patterns. In making decisions regarding the pattern of instruction, the staff should consider the capabilities of the students, the nature of the subject matter, and the instructional requirements for the type of learning represented in the objective (basic skills, thinking skills, attitudes, and so on).

Form of Instruction

Just as there are a variety of patterns of instruction that can be employed for mastery learning, there are a variety of ways to deliver, manage, and conduct

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instruction. The different "forms" of instruction can be differentiated along the dimensions of who or what delivers instruction, who or what manages instruction, and the type of grouping used for the learning activities. These dimensions are shown in Figure 2. Labels are not provided for a given form. The dimensions are offered only to illustrate possible approaches.

In selecting the form of instruction, the staff should decide the following: (a) the primary means by which students will receive instruction (delivery); (b) how they will be informed of what to do and when to change activities (management); and (c) the type of instructional grouping to be used.

When instruction is based upon the use of instructional materials, a distinction should be made between adjunct materials and self-sufficient or "packaged" materials. Adjunct materials are parts of texts or workbooks, filmstrips, cassettes, and other materials that have been identified by the teacher for independent or small group use in learning particular objectives. Materials are located in various centers and, in many programs, students are directed to the mater-

¹ For a discussion of open education assumptions, see: R. A. Horwitz. *Psychological Effects of Open Classroom Teaching on Primary School Children: A Review of Research*. Grand Forks: University of North Dakota Press, 1976.

ials and corresponding activities by the use of learning contracts, learning guides, task cards, or study guides.²

Another way to conduct instruction based on the use of instructional materials is to employ "packaged" materials. These are the kinds of resources that have been predesigned or programmed to provide all the instruction for a given objective. They are often called learning activity packages (LAPS). While that term has taken on a variety of meanings, it is used here to denote the kind of instruction in which the majority of the instructional resources are contained in a single package, box, or folder.

Rather than being based primarily on the use of instructional materials, mastery learning programs can be designed using small group, teacher-led instruction. In this form of instruction, the teacher conducts instruction in a traditional manner for a group of students working on a common unit or objective. Programs that employ this form of instruction often use team teaching to facilitate the grouping process.³

While it is not uncommon to find mastery learning programs relying on teachers and materials to deliver and manage instruction, some schools are realizing the benefits of using students themselves to provide instruction. Students can tutor other students with good results, they can work in small teams to solve problems, and they can conduct group discussions.⁴ Using students as a means of instruction is not as common as the other forms, but it appears to have great promise.

In making decisions concerning the form of instruction, the staff should review and study descriptions of operating programs. For instance, Individually Prescribed Instruction (Glaser and Rosner, 1975) uses the "packaged" approach, Project PLAN* (Flanigan, Shanner, Brudner, and Marker, 1975) employs a learning guide approach, and Individually Guided Education (Klausmeier, 1975) uses small group teacher instruction. Descriptions of other programs that can

Figure 1. Patterns of Instruction

		Objectives	
		School Determined	Student Selected
Instructional Activities	School Determined	Individually Diagnosed and Prescribed	Personalized
	Student Selected	Self-Directed	Independent Study

serve as a basis of analysis have been presented by Briggs and Aronson (1975).

Instructional Programming Procedures

The fourth step is to specify details of the program's operational features. Instructional program-

Figure 2. Forms of Instruction

Instruction Delivered By	Instruction Managed By	Type of Instructional Grouping and Activity
Adjunct Instructional Resources Print and Mediated	Laboratory Guides Learning Contracts Learning Centers Learning Guides Study Guides Task Cards Computers (computer managed instruction)	Independent and Small Group Instruction: Laboratory Sessions Learning Activities Study Projects Work Sessions
Self-Sufficient ("Packaged") Instructional Resources Print, mediated and computers	Laboratory Packages Learning Activity Packages Programmed Instruction Books and Materials Skill Folders Computers	Independent and Small Group Instruction: Laboratory Sessions Learning Activities Study Projects Work Sessions Computer Assisted Instruction
Teacher	Teacher	Large Group Lecture/ Discussion One-to-one Student-Teacher Tutoring One-to-one Conferences Small Group Teacher-Directed Instruction
Student	Student	Student Discussion Groups Student Tutoring Team Problem Solving

ming is a term used by Klausmeier (1975) to describe the sequence of events and decisions that occur as a student progresses through an instructional program.

In formulating programming procedures, teachers should first develop and diagram a general programming model for mastery learning and then elaborate upon the model to coincide with the patterns of instruction and forms of instruction selected in the previous design steps. An example of a general mastery learning programming model is provided in Figure 3. Figure 4 shows a proposed programming model for a mastery learning reading program. It should be emphasized that this is just one programming model that one group of teachers developed in designing their model of mastery learning. The programming

² For information on developing and using learning contracts, see: D. W. Chapman and R. M. Goldman. *Handbook for Managing Individualized Learning in the Classroom*. Englewood Cliffs, New Jersey: Educational Technology, 1975. For information on developing and using learning guides, see: H. D. Dell. *Individualized Instruction: Materials and Classroom Procedures*. Chicago: Science Research Associates, 1973.

³ For information on organizing and using small group teacher-led instruction, see: E. J. Nussell, J. D. Inglis, and W. Wiersman. *The Teacher and Individually Guided Education*. Reading, Massachusetts: Addison-Wesley, 1976.

⁴ For a discussion of students as a means of instruction, see: V. L. Allen. *Children as Teachers: Theory and Research on Tutoring*. New York: Academic Press, 1976.

procedures can assume an infinite number of forms; each staff must develop their own.

Additional Steps

After completing the above steps, the staff should have developed detailed specifications of the program standards they hope to attain, descriptions of the patterns and forms of instruction they intend to use in the program, and a diagram representing the instructional decisions and events that will occur in the program. While the design phase is critical, additional activities must be undertaken before the mastery learning program can become operational. These activities include: (a) development or selection of student learning goals and objectives; (b) development or selection of various assessment instruments for pre-testing, posttesting, diagnosis, and placement; (c) development or selection of instructional materials; (d) organization of the physical space in the classroom; and (e) the design and development of various record keeping forms. In designing, developing, and selecting these components the reader is referred to the works of Gagné and Briggs (1979), Posner and Rudnitsky (1978), and Stephens (1974).

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Figure 4. Example of Programming Procedures for a Mastery Learning Reading Program

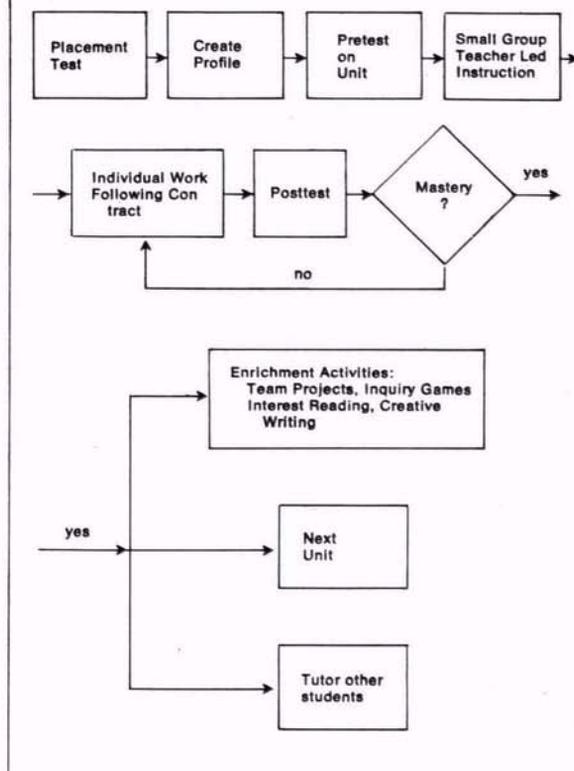
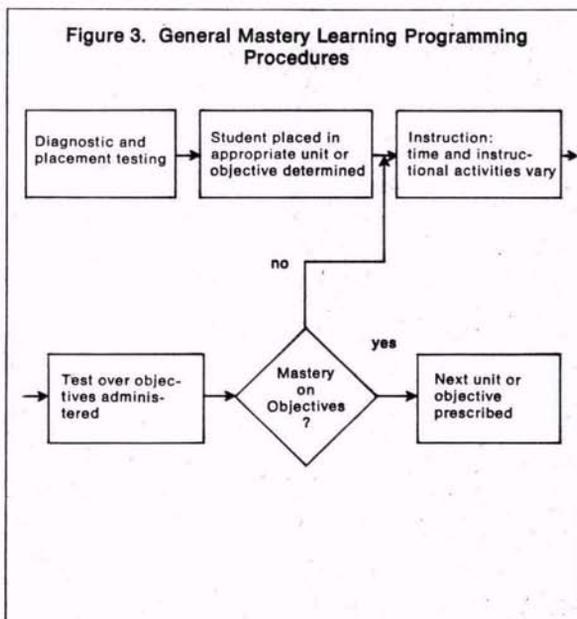


Figure 3. General Mastery Learning Programming Procedures



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