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*Schools have devised several ways to adapt instruction to a wide variety of student abilities and needs. Judged by criteria for what adaptive education should be, most Learning for Mastery programs look good.*

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# Adaptive Education

Lorin W. Anderson

The decade of the 1960s has had a profound impact on American education. At the beginning of the decade, the post-Sputnik panic gave way to a genuine concern for the future of education in this country. In a remarkably short period of time new curriculums appeared in a wide variety of subject areas—mathematics, science, social studies, and others. The assumption underlying this emphasis on curriculum was simple and straightforward. If only we could teach the “right things” then all would be well. Unfortunately, subsequent research suggested that the “new things” were being learned no more effectively than the “old things.”

In a reaction to this research finding, the focus during the latter half of the decade turned to instructional improvement, that is, attempts to improve the effectiveness of learning whatever the curriculum had to offer. Individually Guided Education (IGE), Individually Prescribed Instruction (IPI), Program for Learning According to Needs (PLAN), and Learning for Mastery (LFM) were created during this period.

Designers and advocates of these programs suggested that the reason that the learning of the new curriculums was no more effective than the learning of the old curriculums was that the instructional programs were not sensitive to the needs of and differences among students. Thus the proposed instructional programs, in contrast with those embedded within the old curriculums, focused on ways of being more sensitive to these needs and differences. This focus led Robert Glaser<sup>1</sup> to use the term “adaptive education” to refer to such programs.

The idea of adaptive educational programs is quite simple. Suppose, as is the case in the vast majority of schools, that students enter a particular instructional setting possessing a wide variety of abilities, skills, knowledge, attitudes, and values. Some

<sup>1</sup>Robert Glaser. “Individuals and Learning: The New Aptitudes.” *Educational Researcher* 1:5-12; June 1972.

students possess the abilities necessary for success in the instructional setting; others do not. Adaptive educational programs attempt to *modify* the instructional setting so that students with a variety of abilities can succeed. An attempt is made to provide an instructional setting that will *accommodate* a diversity of students.

### How It's Done

The form this accommodation or modification takes depends on the nature of the program. In IGE programs, accommodation takes the form of providing "an environment in which the individual students learn at rates appropriate to each student and in a manner suitable to each student's learning style and other intellectual and personal characteristics."<sup>2</sup> That is, students are provided with instructional conditions that differ in mode (independent study, tutoring, small group learning, large group learning) and in pacing (some students progress more rapidly than others).

In IPI programs, students are accommodated by placing them into a highly sequenced set of instructional packets and then allowing them to progress at their own pace. While some students may move through three or four packets in a single week, others may move through a single packet in three or four weeks.

PLAN programs also allow for differential pacing of students, and are based on a carefully sequenced set of objectives. In addition, however, accommodation takes place through a variety of instructional materials and activities, the belief being that certain instructional materials and activities will be more appropriate for certain types of learners.

Finally, LFM programs attempt to accommodate students by identifying errors and misunderstandings as they occur and then providing supplementary instruction to help students correct those errors and misunderstandings. This supplementary instruction can take the form of tutors, aides, self-instructional materials, parents, or the teachers themselves.

In sum, then, the accommodation component of adaptive educational programs typically takes *one or more* of the following forms: 1. matching types of learners with appropriate instructional modes or procedures;<sup>3</sup> 2. placing students at appropriate points in a relatively fixed instructional sequence and permitting them to progress at their own rates; 3. providing a wide variety of materials and activities; and 4. providing supplementary instruction in order to correct student errors and misunderstandings.

### Goals of Adaptive Educational Programs

What should be the goals of adaptive educational programs? Although this seems to be a difficult ques-



tion, the answer is deceptively simple. The major goal should be the development of adaptive learners. That is, the goals and objectives of adaptive educational programs should be those that, when attained, will allow students to adapt effectively to a variety of situations.<sup>4</sup> Bloom has termed such students "independent learners."<sup>5</sup> And, according to Bloom, they possess four characteristics.

First, they possess several "higher mental processes." That is, they can analyze situations and problems, solve problems, apply what they have learned to

<sup>2</sup> H. J. Klausmeier, R. A. Rossmiller, and M. Saily, editors. *Individually Guided Elementary Education: Concepts and Practices*. New York: Academic Press, 1977.

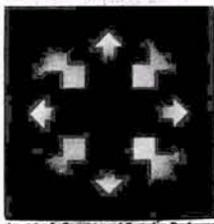
<sup>3</sup> In addition to Klausmeier and his colleagues, other educators have suggested methods for operationalizing this type of accommodation. See: L. J. Cronbach and R. E. Snow. *Aptitudes and Instructional Methods*. New York: Irvington Publishers, Inc., 1977; and, R. S. Dunn and K. J. Dunn. "Learning Styles/Teaching Styles: Should They . . . Can They . . . Be Matched?" *Educational Leadership* 36:238-44; January 1979.

<sup>4</sup> It is interesting to note that several educators and psychologists have considered intelligence to be the ability to adapt effectively to one's environment. Could it be that the major goal of schooling is to teach students to behave intelligently?

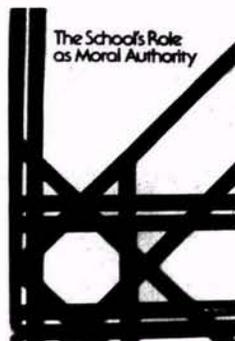
<sup>5</sup> B. S. Bloom. "New Views of the Learner: Implications for Instruction and Curriculum." *Educational Leadership* 35: 563-76; April 1978.

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new situations, make and defend decisions, and reason deductively and inductively. Second, they possess a high degree of self-confidence. That is, they are confident in their ability to learn new things and to succeed in new situations. Third, they are intrinsically motivated rather than extrinsically motivated. That is, they are motivated more by learning in order to attain some goal or objective than by learning in order to get some type of reward (praise, money) for attaining the goal or objective. Fourth, they are socially adept and socially responsible. That is, they can work with and learn from other people in a variety of settings.

To the extent that adaptive educational programs focus on the development of such characteristics in learners, such programs represent a bright spot in the future of American education. To the extent that adaptive educational programs focus on *nonadaptive* goals (memorization of facts, paired associates such as poems and poets, and other material with little later usefulness) or accidentally contribute to the attainment of *maladaptive* goals (production of students who require increasingly more adaptation from their environment), the desirability of such programs is highly questionable.

### Characteristics of "Good" Adaptive Programs

The type of accommodations made by "good" adaptive educational programs are those that will most likely contribute to the development of adaptive learners. Such programs, then, must attempt to foster the ability of students to think and reason, the self-confidence of students, and the development of intrinsic motivation and social responsibility. How can this best be accomplished?

First, cognitive goals beyond recall of knowledge should be included in the curriculum. A large number of cognitive goals focusing on the development of higher mental processes should be included. This is not to say that recall of knowledge is not important. Rather, such knowledge is a means to an end, not an end in itself. The "end" of cognitive learning should be the ability to think and to reason.

Second, the programs must actually help more students to learn, and the students must be able to see that they are learning. In addition, they must be able to secure help when they are having difficulties. These components are necessary if the learners are to develop self-confidence. As a consequence, these programs must have evidence that they are effective. They must contain explicit standards of performance; standards which, when attained, inform the learners and teachers that the objective has been mastered. These programs must also provide opportunities for supplementary instruction as needed.

One final aspect of adaptive educational pro-

grams must be considered in terms of learner self-confidence. For learners to develop self-confidence, they should be able to see that they can learn in a variety of settings (including the ones in which they initially had difficulty and those they will most frequently encounter in future schooling situations).

Third, the programs must develop students who are motivated more by learning in order to obtain goals or objectives than by the rewards that may accrue from learning the goals and objectives. Adaptive educational programs must have explicit goals and explicit performance standards. Without explicit goals, learners do not even know what they are to learn. Without explicit standards, learners are dependent on others for the acknowledgement of success and provision of rewards. Without explicit standards, then, learners continue to be dependent on the values and reward structure of significant others (teachers, parents, and peers). With explicit standards, learners can become independent since they can ascertain for themselves when they have and have not learned. Students can even learn to set standards for themselves.

Fourth, the programs must encourage interpersonal relations if they are to develop socially responsible learners. Two aspects of these programs seem especially important in this regard. First, students must be allowed to learn from and with each other. Second, the evaluation of students on the basis of explicit preset performance standards also encourages positive interpersonal relations since all students can attain positive evaluations. (Conversely, of course, all students can attain negative evaluations under certain circumstances.) In any case, students are not competing with one another for scarce rewards.

Several criteria can be suggested for the evaluation of an adaptive educational program. According to these criteria "good" adaptive educational programs would possess the following six characteristics: 1. a number of cognitive goals that focus on the development of the learner's higher mental processes; 2. explicit goals and performance standards; 3. a documented or demonstrated increase in the number of learners who attain the specified goals; 4. opportunities for supplementary instruction when needed; 5. a focus on helping the learners to learn in instructional conditions that they will encounter frequently in the future; and 6. the provision of opportunities for learning in social settings.

### Learning for Mastery as an Adaptive Educational Program

How do Learning for Mastery programs stack up against these criteria? Most LFM programs that I have observed have a fairly small number of goals that are concerned with the development of higher

mental processes. The vast majority of the goals tend to be written at the two lowest levels of Bloom's taxonomy. This condition is not unique to LFM programs, however. Most adaptive educational programs suffer from this problem.

LFM programs do contain explicit goals and performance standards. And, in general, LFM programs are effective in accomplishing those goals. Evidence



Lorin W. Anderson is Professor of Education, The University of South Carolina, Columbia.

suggests that an increase in learning does occur within LFM programs.<sup>6</sup>

LFM programs do provide opportunities for supplementary instruction. LFM programs also focus on helping students learn in instructional conditions that they will encounter in the future. LFM programs tend to "force" the students back into "typical" group-based instruction after they have experienced more "individualized" supplementary instruction. This criterion is one that most clearly differentiates LFM programs from other adaptive educational programs.

Finally, LFM programs do provide opportunities for learning in social settings. The majority of LFM programs use peer tutors and/or small group study to provide the necessary supplementary instruction. A small amount of evidence<sup>7</sup> suggests that the use of peer tutors and small group study increases the cohesiveness of the class. In contrast to LFM programs, some adaptive educational programs actually discourage social and interpersonal relations.

In sum, then, LFM programs compare quite favorably with the desired characteristics. To the extent that these are valid criteria, then, LFM programs tend to be "good" adaptive educational programs. And, to the extent that the criteria are valid, all adaptive educational programs should be examined relative to these criteria before they are widely embraced.

<sup>6</sup> In addition to the Block and Burns article mentioned earlier, a variety of nonpublished LFM project reports present such evidence.

<sup>7</sup> See: Gregg Strasler. "Student Learning Outcomes of Mastery Learning." Unpublished doctoral dissertation, University of South Carolina, 1979.

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