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By-Heathers, Glen

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Pittsburgh Univ., Pa. Learning Research and Development Center.

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The idea of "grouping" in schools ranges from group teaching to grouping of pupils, with many variations on these two themes. The self-contained classroom, found usually in the elementary grades, consists of one teacher with one grade-level class for the full day and for all subjects. The departmental approach, found at all levels, employs teachers to teach a particular subject or two only, and the pupils, during a school day, move from class to class. Team teaching occurs when two or more teachers share in teaching one particular group of students, usually in just one curricular area. Nongraded instruction enables students to advance in the curriculum according to their individual capacities. Perhaps most research in the grouping area has involved ability grouping, in which students of a given grade are divided up according to degree of ability or achievement. Other within-grade organization has been attempted; for example, planned heterogeneous grouping and teachability grouping. The research in many of these areas is inconclusive and incomplete and fails to determine the contribution of the organizational plan being examined. (WD)

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Glen Heathers

Learning Research and Development Center
University of Pittsburgh

Grouping is a much-used term in the vocabulary of school organization because group teaching is the prevailing practice and because many varieties of grouping have been devised to make the teaching of groups more effective or more manageable. For over a century, group teaching of grade-level classes has dominated instruction in elementary and secondary schools. Both grade placement and group teaching tend to ignore differences among students. The grade system calls for presenting the same basic grade-level curriculum to all students having the same number of years of schooling. Group teaching has been mainly whole-class teaching in which the methods and pacing of instruction, as well as the lessons taught, are largely the same for all members of the class.

The large differences in intellectual abilities and educational attainments among students of any age level have forced a continuing examination of grouping practices and of instructional methods. A result has been the invention and tryout of many ways of setting up instructional groups as well as various methods of instruction that are intended to take account of differences among the students in a group. These two approaches to dealing with individual differences usually have developed independently of each other. Innovators either have tried changing the composition or size of the group, or have tried new methods for differentiating the instruction given group members, not both.

VARIETIES OF GROUPING

The most comprehensive review of grouping practices and research is the volume edited by Yates (1966). This report was sponsored by the Unesco Institute for Education in Hamburg and deals with grouping in various countries including England, Italy, Sweden, The United States, and West Germany. A feature of the book is a 125-page section presenting abstracts of 50 selected research studies on grouping.

Shane (1960) offers a list of 32 grouping plans within the elementary school. Yates (1966) presents a list of 17 varieties of grouping in elementary and secondary schools. A partial list of major sorts of grouping includes grade-level grouping; tracking students into different curricular sequences; ability or achievement-level grouping within a grade; assigning students to special classes; multi-age or multi-grade grouping; differential grouping, subject to subject; flexible grouping according to students' capabilities with different learning activities; and numerous methods of intra-class grouping. Most grouping practices are intended to produce classes that are relatively homogeneous in one or more characteristics related to learning. Some practices, however, seek to make the group heterogeneous in abilities, achievement, age, personal-social characteristics, etc.

A valuable selection of articles reporting studies of grouping has been reprinted by Hillson (1965). Anderson (1962) offers a concise summary of grouping practices. An early review of grouping practices and research is the 35th Yearbook of the N.S.S.E., Part I edited by Whipple (1936). A number of recent general surveys of bibliographies on grouping is available: Franseth and Koury (1963, 1964), Goodlad (1960), Morganstern (1966), Otto (1964), Wrightstone (1957), and Yates (1966).

INTER-SCHOOL GROUPING

Yates (1966) presents a survey of the approaches used in various countries to allocate students to schools. In reviewing the sparse research on the effects of assigning students to selective rather than comprehensive schools, he concludes that virtually all the studies of inter-school grouping at the secondary level have found that schools with heterogeneous populations maintain achievement at least as high as selective schools. The ablest students are not found to suffer losses in achievement in comprehensive schools. There is some evidence that less-able students do not learn as well when segregated into special schools as when left in comprehensive schools.

SCHOOL ORGANIZATION AND GROUPING

Grouping is an aspect of organization for instruction that has intimate relations with such other aspects as staff assignments, scheduling, uses of

space and equipment, and intra-staff communications. Goodlad (1963) offers an important distinction between vertical and horizontal organization of instruction. The former concerns how students move upward along the curricular sequences from year to year. It covers graded, nongraded, and multigraded progression. Horizontal organization concerns the assignment of students to teachers and instructional groups. It includes the self-contained classroom and departmentalization, heterogeneous and homogeneous inter-class grouping, patterns of flexible scheduling, and team organization. Summary descriptions and analyses of three major types of organizational plans are presented by Heathers (1966).

Self-contained classroom. The commonest basis for organizing instruction in the elementary school is the so-called self-contained classroom in which a general elementary teacher is assigned one grade-level class for the full day and is called upon to teach all curricular areas except as assisted or replaced by specialists in art, music, physical education, remedial reading and speech, library, or foreign language. This plan of organization contrasts with the departmentalized program based on specialist teaching that is usual in secondary schools.

Proponents of the self-contained classroom, as represented by the contributors to the volume edited by Snyder (1960), have claimed that the young child needs the one-teacher plan in order to meet his emotional-social needs and to be assured of instruction in the several curricular areas that is properly correlated. They have sharply criticized departmentalization in the elementary school, claiming that it leads to subject-centered rather than child-centered teaching and that it destroys the unity of the child's instructional program. An example of this position is found in Fleming and others (1960) who take issue with the semi-departmentalized dual progress plan devised by Stoddard.

Opponents of the self-contained classroom, as represented by Stoddard (1961), contend that the all-purpose teacher cannot offer knowledgeable and inspirational instruction in all of the major curricular areas. Also they claim that the grade-level curriculum and grade-level grouping as found usually in the self-contained classroom fail to provide for individual differences among learners of a given age level.

Research on the self-contained classroom largely consists of studies conducted by proponents of other plans who have compared outcomes of departmentalization, team teaching, or nongrading with outcomes of instruction in the self-contained classroom.

Departmental organization. Between 1900 and 1930 departmentalization became a common practice in America's elementary schools. Otto (1932) found that some variety of departmental organization existed in 84 percent of eight-year elementary schools as of 1929 and in 37 percent of six-year elementary schools. The practice declined thereafter. According to Dean (1960), over 75 percent of elementary schools employed only the self-contained classroom at the time of his study and less than one percent were fully departmentalized.

A trend began about 1955 toward the increased use of departmentalization in elementary schools, especially in the upper grades. This trend is shown in a national questionnaire survey of elementary school principals conducted by the National Education Association (1962). In the survey, 20 percent of respondents reported that there had been some departmentalization in their schools in 1956. As of 1961, 36 percent of the principals reported some departmentalization and 49 percent predicted that their schools would have some in 1966.

The usual reason for departmentalizing instruction in elementary school is to provide for having specialist teachers of the major curricular areas. In the 1950's, demands arose for specialist teaching of science and mathematics because of concerns about improving instruction in these areas in the interest of national security. Also, the new curricula being developed in these areas called for subject-matter knowledge that most general elementary teachers did not possess. In a study of attitudes of elementary teachers in an eastern city of about 25,000, Ackerlund (1959) found that the majority of teachers in the upper grades would prefer teaching in a departmental program to teaching in the self-contained classroom. A majority of them did not feel adequately prepared, either in knowledge of subject matter or of teaching methods, to teach all of the major subjects.

Research on departmentalization is limited, much of it is of poor quality, and the reports of studies do not provide the data needed to identify

the features of departmentalization that are responsible for the outcomes. In many departmental programs, the only readily observable differences from the self-contained classroom involve moving from room to room and teacher to teacher; student grouping remains unchanged and no major changes can be observed in the contents or methods of instruction. Rouse (1946) found few differences in classroom practices in an observational study of departmentalized and non-departmentalized programs in the elementary school. There is little reason to expect such differences when one considers that the teachers in departmentalized programs usually have had training and experience only as general elementary teachers. Elementary teachers assigned as specialists of science, mathematics, English, or social studies often have had few more content or methods courses in their specialty than the average among general elementary teachers as Gibb and Matala (1962) and Heathers (1967) have shown.

Studies of the effects of departmentalization on academic achievement and on students' personal-social adjustment have not yielded consistent findings. Spivak (1956) found that ninth-grade students who had been in the self-contained classroom in Grades VII and VIII achieved significantly more than students who had been in a departmentalized program during these grades. Gibb and Matala (1962) obtained some reliable differences favoring departmentalization, though most of the comparisons did not reliably favor either the departmental plan or the self-contained classroom.

Tulsa, Oklahoma employed a semi-departmental plan in its elementary schools in which students received instruction in language arts, social studies, and mathematics under a homeroom teacher during one half-day, while they studied during the other half-day under different specialist teachers of art, music, physical education, speech, and library. Broadhead (1960) presents evidence that pupil adjustment as measured with the SRA Junior Inventory was higher with Tulsa fifth-graders than with a control group composed of pupils from other school systems who had studied in the self-contained classroom. However, the validity of the Junior Inventory as a measure of adjustment is doubtful, and Broadhead does not offer sufficient evidence that population characteristics of his comparison groups were controlled.

Another semi-departmental plan for the upper years of the elementary school is the dual progress plan devised by Stoddard (1961). The plan, as employed in Grades III-VI or IV-VI, calls for full-time specialist teachers of English and social studies, mathematics, science, art, music, and physical education. Instruction in English, social studies, and physical education is on a grade-level basis and occupies one half-day. Instruction in mathematics, science, art, and music in the plan is organized on a nongraded basis with cross-graded, achievement-ability grouping of students for each subject separately.

The pilot test of the plan reported by Heathers (1967) accomplished implementation of the major structural features of the plan. However, numerous requirements of the plan were not implemented in the conduct of instruction. Thus, a mastery criterion was not employed in determining whether a student had completed a learning task and was ready to proceed to the next task in the curriculum sequence. Also, teachers often did not advance students at different rates as called for in the nongraded curricular areas. Interpreting results of the dual progress plan is made difficult because the plan introduces at the same time a semi-departmental schedule, specialist teaching, ability grouping, differential grouping from subject to subject, and nongrading in some curricular areas. The major findings with this plan are referred to in the later section of this article on ability grouping since this appeared to be the most influential feature of the dual progress plan.

In the junior high school, core programs provide a compromise between the self-contained classroom and the fully-departmentalized programs of most secondary schools. In the core approach as described by Wright (1958) and Della-Dora (1960), English and social studies are taught as one integrated curriculum, in one time block, and by one teacher. Similarly, in many core programs, mathematics and science are taught together by one teacher. Core programs are meant to offer a more secure emotional-social setting than regular departmental programs, and to correlate instruction in related subjects better. Research studies reviewed by Michelson (1957) have not demonstrated any major effects of core programs on students' achievements or their adjustment at school. In the pilot study of the dual progress plan, the attempt was

made to implement the plan in Grades VII and VIII of the junior high school. This called for having one teacher conduct instruction in English and social studies according to the core approach. This feature of the plan had to be dropped since, as reported by Heathers (1967), teachers could not be found who were prepared and willing to teach both curricular areas.

Research on departmentalization in the elementary school does not provide evidence that the practice lessens the unity of the child's educational program or that it has negative effects on his personal-social growth. The studies reported by Gibb and Matala (1962) and Heathers (1967) found that the great majority of students preferred having different teachers and liked changing classes. Also, Heathers (1967) reports that about 75 percent of elementary teachers in the pilot test of the dual progress plan expressed a preference for being assigned as specialists in one curricular area. In the same study, over 80 percent of parents who responded to an anonymous questionnaire expressed favorable attitudes toward the semi-departmental program.

Team organization. Team teaching, also called cooperative teaching, occurs when two or more teachers share in planning and conducting instruction that is offered to the same group of students, whether at elementary, secondary, or college levels. Departmentalization, in contrast, occurs when two or more teachers divide the instruction offered students without joint planning and correlated teaching. Elementary school teams usually cover all or almost all areas of instruction with the students assigned to the team. Teams in secondary schools usually cover instruction in one curricular area or in two closely-related areas. A team organization frequently has been employed at college, especially in education courses.

A detailed treatment of the theory and practice of team teaching is available in the volume edited by Shaplin and Olds (1964). Briefer general accounts of cooperative teaching can be found in Anderson (1966) and in a special issue of The National Elementary Principal (1965). The program at Lexington, Massachusetts is described and evaluated in Bair and Woodward (1964). Extensive bibliographies on cooperative teaching are to be found in the references just cited, in Davis (1964) and in Lambert and Others (1964).

A great variety of organizational patterns are included under the umbrella label of team teaching. Teams vary in size from two elementary teachers who share the instruction offered 40 or 50 students to teams made up of as many as eight teachers and over 200 students. Some teams are organized on one grade level while others contain students from two or three adjacent grade levels.

Teachers' assignments within teams represent a considerable number of roles and specializations. Team roles include those of team leader, master teacher, part-time teacher, intern teacher, teacher aide, and team clerk. Team members may specialize in teaching one curricular area, in teaching certain units within a curricular area, in teaching large or small groups, in teaching children with certain kinds of learning difficulties, in conducting instruction with the use of technological aids, or in supervising intern teachers.

The term team teaching is misleading since it usually happens that one teacher conducts the instruction offered a group at any given time. Woodring (1964) suggests that a better descriptive label would be "team organization and planning." However, in many teams, planning of instruction in a given area is done mainly by one or two team members who specialize in teaching that area. It should be clear that there cannot be sufficient time in whole-team meetings to do the many hours of instructional planning required. Team planning tends to focus on making over-all curriculum decisions, on scheduling, on discussing special problems of students, and assessing and reporting students' progress. Grannis (1964) offers an exploration of team planning of a curriculum unit that elucidates both the potential of teamwork and the demands it places on team members.

Some educators prefer introducing specialist teaching in the elementary school within the context of cooperative teaching rather than departmentalization in order to ensure that the instruction the student receives in different subjects is properly correlated. Cooperative teaching, however, does not guarantee that instruction in different fields will be correlated adequately. Many times the members of a team lack the training required for planning effectively together, and usually a team lacks the time needed for cooperative planning of individual students' programs.

A central aspect of most team plans is flexible grouping. The plans call for varying group size from very large to very small, depending on the learning task and the abilities of students. A working assumption has been that some curricular areas--particularly social studies, science, and literature--are well-suited for large-group instruction. A bonus that can result from large-group teaching is that some members of the team are freed to work with small groups or with individual students, to plan, or to confer with other teachers or parents. Wallace (1965) explored the issue concerning whether large-group instruction can take account of individual differences among students. His answer was positive, but called for following large-group sessions with small-group activities that involved all members of the instructional team.

The theme of flexibility applies to virtually all aspects of team organization and functioning. In addition to the continual variation of group composition and size, flexibility also occurs in scheduling of time, space, and personnel. The plan for the secondary school described by Trump and Baynham (1961) places emphasis on flexibility. Bush and Allen (1964) offer a method for flexible scheduling in the high school that uses an electronic computer.

Research on cooperative teaching is generally of poor quality. Most of the studies have been descriptive rather than evaluative. In a review of the research conducted up to 1963, Heathers (1964) found no well-controlled studies that measured outcomes of team teaching. The results reported could not be interpreted because of a lack of data on the implementation of the plans being compared. Also, the reports did not provide a basis for determining spearately the effects of different features of the team organization such as flexible scheduling, flexible grouping, staff specializations, the use of teacher aides, or team planning. The reports available then did not indicate any substantial effects of the plans on student achievement. Generally, attitudes of students, parents, and teachers were favorable toward the team plans.

Bair and Woodward (1964) report favorable outcomes of the Lexington Plan with respect to student achievement and attitudes of participants. Their analysis on financing team teaching led to the conclusion that the

Lexington Plan need not be more expensive than conventional plans. Lambert and Others (1964), in a study comparing team teaching and the self-contained classroom, found significant differences between the two plans in classroom interaction patterns and in student achievement, but not in student adjustment. Interpreting their findings is made uncertain by the fact that they did not offer data on the conduct of instruction in the two plans. Also, they did not offer data on the comparability of the staffs serving the two plans.

Nongraded organization. Nongrading, as the concept is presented by Goodlad and Anderson (1963), refers to any approach that breaks away from conventional grade-level instruction and enables students to advance in the curriculum at rates corresponding to their individual capabilities. While nongrading or "continuous progress" can be accomplished by differentiating instruction within any organizational pattern, many school systems with nongraded programs make use of multi-age grouping to bring together students who are at about the same level of advancement in one or more subjects. Other schools set up within-grade achievement-level grouping to facilitate differential pacing. In elementary schools, nongraded programs are most numerous in the primary years though some school systems have introduced nongrading on a K-6 basis. Usually nongrading in the elementary school applies only to skill learnings in reading and mathematics. Some high schools have adopted nongraded programs, most frequently following the model developed by Brown (1963). In this plan, nongraded advancement applies to mathematics, science, English, and history.

The general assumptions underlying nongrading are that learning effectiveness, motivation to learn, and mental health all will be enhanced by gearing the student's advancement in the curriculum to his learning rate. With slow learners, allowing more time for studying a unit is intended to permit them to master each task before proceeding to the next. With rapid learners, nongrading is intended to permit faster progress and to reduce experiences of boredom and cheap success associated with a pace geared to slow-learning students.

The use of achievement-level grouping to foster nongraded advancement assumes that teachers will differentiate instruction in level and range from

group to group and from individual to individual within a group. Unfortunately, research studies on nongrading usually have been silent on how, or to what extent, teachers actually adapted their instruction to promote nongraded advancement. The research reports ordinarily offer a description of the structural features of the new program without giving data on how instruction was adapted to suit the purposes of the program. Lacking data on actual implementation, the reader is unable to interpret outcomes of so-called nongraded programs. The seriousness of this matter is indicated by the fact that Goodlad and Anderson (1962), in a survey of nongraded programs at the elementary level, found many where the local school leadership had set up homogeneous groups but appeared to practice no nongrading.

Despite the fact that nongraded programs have been in operation in hundreds of elementary schools for a number of years, there is an extraordinary paucity of research studies of nongrading. As Goodlad and Anderson (1963) indicate, most of the studies that have been conducted are subject to one or more of these weaknesses: a failure to report instructional practices within the nongraded structure, confusing interclass grouping with vertical progression, and using improper bases for comparing progress with graded and nongraded instruction. These authors review several studies, as does Halliwell (1963). Hillson and Others (1964) report a controlled study of nongraded reading in the primary school. The commonest finding is that nongraded programs at the elementary level result in gains in the skill subjects that are made the foci of the programs. The researchers report favorable reactions of students and teachers toward the nongraded programs. However, Hopkins and Others (1965) report no reliable effects of nongrading on reading achievement and Carbone (1961) reports that a graded program was superior to a nongraded program in terms both of achievement and mental health of students. Anderson and Goodlad (1962) criticize the Carbone study because the report indicates that there were no significant differences in instructional practices between the graded and nongraded programs. The assumption underlying nongrading is that it introduces differences in vertical progress in the curriculum. When no such differences are introduced, there is no reason to expect that a nongraded program will produce changes in instructional outcomes.

As of 1966, no research study of the effects of nongrading at the secondary level was found in the literature. Brown (1963) asserts that the program at Melbourne High School led to a great decrease in the frequency of dropouts. However, he does not present the data needed to support this assertion. Also, Brown claims that the proportion of Melbourne graduates attending college increased to 70 percent from a base of 40 percent prior to the nongraded program.

Despite the emphasis its proponents have placed on using nongrading as a way of removing the stigma associated with being a slow learner, no research reports were found that offer objective data on this matter. Also, no research reports were located that dealt with the role of nongrading in eliminating remedial problems through ensuring that a slow learner masters each level of work before proceeding to the next level.

ABILITY GROUPING

The great bulk of research on grouping has dealt with attempts to measure the effects of dividing students of a given grade level in a school into classes of restricted range in ability or achievement. Ability grouping, as that term is conventionally used, includes achievement-level grouping of members of a grade level. Achievement-level grouping that brings together students from different grade levels is variously called nongraded, ungraded, multi-grade, multi-age, or inter-age grouping.

The term ability grouping covers a great array of methods for setting up instructional groups. In the elementary school, a frequent practice has been to assign the students of a grade level to groups made relatively homogeneous in I.Q., reading achievement, or the two criteria combined. In secondary schools, a frequent practice has been to assign students to one of three tracks representing high, medium, and low levels of intellectual performance. The criteria for assigning students to tracks may be I.Q., general grade average, achievement test scores in such subjects as reading and mathematics, and teachers' ratings. Because of the variety of methods included under the rubric of ability grouping, it is vital to specify the students, curricular areas, and criteria involved in any instance of ability grouping.

Ability grouping became common in the United States around 1920, following closely on developments in testing that provided standardized group measures of intellectual performance. The rapidity of adoption of ability grouping is indicated by Otto (1964) who reports that, as of 1926, elementary pupils in at least some grades were ability-grouped in 36 out of 40 American cities with populations over 100,000. In the late 1930's and the 1940's, there was a decline in ability grouping, related in good part to objections raised by proponents of progressive education who felt that the practice stigmatized slow learners and made snobs out of the ablest students.

Since 1955, there has been a marked resurgence of interest in ability grouping, stimulated by the increased concern about academic attainment, especially on the part of gifted children. In a survey by the National Education Association (1962), it was found that 52 percent of a national sample of principals of large elementary schools saw an increase in ability grouping in their schools between 1956 and 1961 while only seven percent saw a decrease during that period. However, heterogeneous grouping through Grade VIII remained the commonest practice in America's schools according to a study by Dean (1960). In that year, a national sample of school leaders reported ability grouping in Grades I-VI at only 17 percent of schools and, in Grades VII and VIII, at 34 percent of schools.

Research on ability grouping in the United States has been concentrated within two periods, 1920-35 and since 1955. The number of studies runs into the hundreds. However, all but a few of these studies are so poorly designed that little reliance can be placed in their findings. Billet (1932) judged that 104 out of 108 studies he reviewed were not adequately controlled. Eckstrom (1959) reviewed studies of homogeneous grouping, finding just 33 that were designed well enough to justify reporting their findings. The years between 1959 and 1967 were a banner period for research on ability grouping with more major controlled studies reported than during all the previous years taken together. Several recent publications offer valuable reviews of research in the field: Borg (1966), Daniels (1961), Eash (1961), Eckstrom (1959), Gold (1965), Goldberg and Others (1966), Svensson (1962), and Yates (1966).

The basic assumptions underlying ability grouping are that it materially reduces the range of learning-related differences within a group as compared with random grouping, and that this reduction of range facilitates teaching and learning. There is no doubt that one can achieve the intended reduction of range in terms of any one grouping criterion, or in terms of a set of closely correlated criterion variables. Thus, if 75 students are divided into three classes of 25 in terms of rank-order scores on an intelligence test, the mean range for the three classes will be one-third that of the total group. However, students' characteristics as learners are not adequately represented by their scores on a general intelligence test. A student's ease and rate of learning varies greatly from one learning task to another. Also, his level of achievement varies considerably from one curriculum area to another, and from topic to topic or task to task within each area.

It is generally recognized that scores on intelligence tests and standardized test of achievement are substantially correlated. However, when pupils are grouped on the basis of I.Q. alone it has been found that the range of scores on achievement tests is still great. Goodlad (1960) cites evidence to indicate that dividing students of a grade level into two or three groups in terms of a measure of general intellectual performance reduces variability in school achievement only about seven and 17 percent, respectively. With larger numbers of groups, the reduction of range becomes greater. The most effective way to reduce the range of a class in achievement is to group differentially, subject by subject, and to base this grouping on separate measures of achievement for each area. However, within such groups, there would remain large differences in ability and in many other variables that influence learning.

The theoretical bases for ability grouping ordinarily have been implied rather than stated in research reports. A common assumption is that a teacher can more readily adapt instruction to differences among students when the range of differences within a class is reduced. Why should this be so? The answer, seldom stated in reports of studies, is that group teaching becomes more manageable when the members of a group have more characteristics in common. In short, the chief working assumption underlying ability grouping is that it facilitates teaching the members of a group as though they did not differ from one another.

Usually reports of studies of ability grouping are vague about the ways in which teachers are expected to differentiate the instruction they offer classes representing different ability levels. Most often, the reports infer that teachers will vary one or more of the following: learning tasks, including the use of enrichment activities or advanced materials with gifted students; instructional methods - drill with slow groups, projects with abler groups, etc.; and the pace of advancement, with slow groups normally being allowed more time with a unit of work.

Some assumptions about the effects of ability grouping concern reactions of students to their group assignments. It has been claimed often that the rapid learner should benefit from ability grouping through being freed from instruction geared to less-capable learners and through being challenged to keep up with his intellectual peers. The slow learner, it is claimed, should benefit from instruction geared to his capabilities and from experiencing success more often in the absence of the ablest students. Opponents of ability grouping have claimed that slow learners are stigmatized by being placed in low groups and that they are apt as a result to lose interest in studying.

A limitation in research on ability grouping is that virtually all of the studies, including the large-scale researches conducted most recently, have failed to measure ways in which the instruction given to ability groups compared with that given to the relatively heterogeneous groups making up the control populations. As Passow (1962) has noted, some studies called for differentiating the instruction given to high-and low-ability groups, while others called for keeping course content and methods similar with all groups. Even when the study design called for differentiating instruction, usually no objective data were obtained on the manner and extent of such differentiation. Data on the independent variables in the study usually were restricted to details on how groups were set up and on how teachers were assigned to groups. In some studies, impressionistic data were obtained on how teachers conducted instruction with the experimental and control groups. Such data usually have consisted of teachers' reports.

The lack of objective measures of independent variables is not uncommon in educational field studies. The explanation is not far to seek.

Obtaining specific data on instructional practices in the classroom is enormously difficult and time-consuming. Valid and efficient ways to measure classroom practices are virtually lacking. Teachers are unprepared to provide reliable data on how they teach. Staffs of research projects are never large enough to gather the needed data from a large number of classrooms over a lengthy period of time.

What effects has ability grouping been found to have on students' achievements? No consistent effects have been found when mean scores of experimental and control populations representing the full range of abilities were compared. Thus, Eckstrom (1959) identified 13 studies with findings favoring ability grouping, 15 where no significant effects were found or where results with heterogeneous groups were superior, and five where results were partially favorable and partially unfavorable to ability grouping.

Major studies conducted since 1959 have found no clear and consistent effects of ability grouping on student's achievement when total student populations were used. This finding has been obtained in the studies by Goldberg and Others (1966) and Wilcox (1961) where no efforts were made to differentiate the instruction given to groups of different ability levels, and in the studies by Borg (1966) and Drews (1963) where such efforts were made. In some studies, the results varied significantly with the learning tasks under consideration. Thus, Borg found that achievement in subject matter tended to be greater with ability grouping while study methods tended to be superior with heterogeneous grouping.

In the study by Goldberg and Others (1966), a broad range of ability within a group, as compared with a narrower range was associated with somewhat greater gains in all subjects except reading. It is important to note that this study sought to measure the effects of ability grouping per se without making specific provisions for varying instruction according to ability level. As Borg (1966) notes, this sort of study tells nothing about the effects of ability grouping when it is accompanied with appropriate differentiation of instructional contents and methods. However, Borg's study does not solve this difficulty since it merely calls for using enrichment to differentiate instruction given gifted students in the heterogeneous control classes, while using

differences in the rate of advancement with ability-grouped classes in the experimental treatment. The report of the study does not offer measures of the actual differentiation of instruction along the lines called for in the study design.

There is mounting evidence that ability grouping is apt to have significant, and significantly different, effects on the achievement of students of high and low ability even when it does not significantly influence the achievement means of total student populations. The studies reported up to about 1955, as summarized by Goodlad (1960), tended to favor ability grouping for both rapid and slow learners, with the latter benefiting more from the practice. Recent studies have cast serious doubt on this conclusion from earlier studies. Daniels (1961) found ability grouping to produce losses with both high-ability and low-ability students, though the latter suffered the greater losses. Some investigators, notably Borg (1966) and Heathers (1967), have found ability grouping to be associated with gains for rapid learners that were offset by losses for slower learners. This is a case of the rich getting richer and the poor getting poorer. The fact that Daniels (1961) and Heathers (1967) have found ability grouping to be associated with an increase in the dispersion of student's scores on nationally standardized achievement tests is readily understood when one considers that the practice tends to widen the gap in attainments between educationally advantaged and disadvantaged students.

Recent studies have in some cases found ability grouping to be associated with increased attainments by high-ability students and in other cases with lowered attainment. The former relationship was found in studies by Borg (1966) and Douglas (1964) and Heathers (1967) while the latter was found by Abrahamson (1959) and Goldberg and Others (1966). Probably these opposite findings reflect differences in adapting instruction to meet the capabilities of superior students.

Major studies reported in the 1960's lend strong support to the view that ability grouping is associated with detrimental effects on slow learners. Such learners have been found to receive lower scores on achievement tests when placed in low ability groups than comparable students received when

taught in heterogeneous groups. This finding has been reported by Borg (1966), Dockrell (1964), Douglas (1964), and Heathers (1967). Several explanations can be offered to account for this. One is that slow learners, in the absence of superior students, have fewer opportunities to learn vicariously through paying attention during classroom discussions. Other explanations fall under the heading of "self-fulfilling prophesies," namely, that teachers expect less from students who are assigned to low groups and teach them correspondingly less. Also, students who are assigned to such groups expect less of themselves and behave accordingly.

The most dramatic evidence for the self-fulfilling prophesy comes from a study by Rosenthal and Jacobson (1967). In this study, randomly-selected students from a class were identified to the teacher as "academic spurters." Over the next several months, these students showed reliable gains in I.Q. scores as compared to other students. This finding was true equally with students who were in fast, medium, or slow groups. Teachers rated students who were labeled academic spurters more favorably in a number of characteristics, provided that they were members of the fast or medium ability groups. They did not extend these favorable attitudes toward members of the slow groups. Evidently, they had difficulty believing that students in slow groups had desirable characteristics even though they had reacted to "academic spurters" in these groups in ways that increased their scores on an intelligence test.

There is evidence from some studies that the quality of instruction offered low groups tends to be inferior to that offered groups made up of abler students. In the study reported by Heathers (1967), teachers indicated that they stressed basic skills and facts with slow learners and used drill a great deal with these students. On the other hand, they stressed conceptual learning with high-ability groups and encouraged students in these groups to conduct independent projects. Squire (1966) reports that a national study of the teaching of English in high school revealed that teachers tended to employ dull, unimaginative instructional approaches with slow-learning groups.

Ability grouping has been criticized as a form of segregation that has unfavorable emotional-social effects on children who are assigned to low

groups. Such groups tend to be used as dumping grounds for students who, for a variety of reasons, perform poorly in their academic work. Low achievement in school subjects results sometimes from limited intellectual endowments, but it may result also from low motivation to study, from emotional difficulties, from poor health, and from environmental handicaps. It is commonly recognized that low-ability groups in elementary school have a disproportionate number of boys, of children from lower-class origins, and of children from minority groups. Ability grouping is an agency for maintaining and enhancing caste and class stratification in a society.

Studies have shown that children from the middle and upper classes are found mainly in the high-ability groups, while children from the lower classes are found in the low-ability groups. This finding appears in reports by Douglas (1964), Husen and Svensson (1960), and Willig (1963). Deutsch (1963) presents a strong case for heterogeneous grouping in integrated schools.

Daniels (1961) found that, once a child is assigned to an ability level, he is very likely to remain there. In his study, while teachers thought that about 17 percent of students were shifted from one level to another each year, actually only about two percent were shifted.

Research on the effects of ability grouping on non-cognitive variables has been summarized by Borg (1966). In Borg's own study, high-ability students were found to lose sociometric status with ability grouping, while low-ability students gained. However, both categories of students showed a loss in self-concept with ability grouping. In studies by Drews (1963) Goldberg and Others (1966), and Wilcox (1961), slow learners had higher self-concept ratings with ability grouping. Evidence that students prefer membership in high-ability groups comes from the study by Luchins and Luchins (1948) where bright students indicated they would not want to be transferred from the topmost ability group to the next lower group even though the teacher in the latter group was "better and kinder."

A pair of studies by Atkinson and O'Connor (1963) tested the prediction that the effects of ability grouping would vary depending upon the

strength of the student's motivation to succeed relative to the strength of his anxiety about failing. A study with sixth graders found that ability grouping had positive effects on achievement with those students who had high motivation to succeed relative to the strength of their anxiety about failing. A study with ninth graders did not support this finding. These studies have added an important dimension to research on ability grouping by seeking to test whether students' personality characteristics are determinants of the effects of such grouping.

OTHER INTER-CLASS GROUPING PATTERNS

The bases for setting up instructional groups most often have involved the issue of heterogeneous versus homogeneous grouping at grade level, or that of graded versus nongraded grouping. Other bases that have been used in setting up classes are planned (rather than random) heterogeneous grouping and "teachability" grouping.

Planned heterogeneous grouping. School systems often have set up within-grade heterogeneous groups on some bases other than random assignment. Sometimes they have balanced groups in terms of I.Q. distribution. Other times, they have tried to distribute leaders or trouble makers equitably among the groups at a grade level. No studies have been located that test outcomes of such grouping practices.

Recently, heterogeneous multi-age grouping has been tried, notably in elementary schools at Torrance, California. In reporting the program there, Hamilton and Rehwoldt (1957) contend that grouping should be on the basis of differences rather than similarities on the assumption that "by their differences they learn." They describe a controlled study in which the experimental subjects were in groups composed of students from Grades I-III or IV-VI. They found that academic achievement of students in wide-range classes was superior to that of students in single-grade classes. Also, the authors report favorable effects of multi-grade grouping on students' social adjustment and their personality development. Similar results are reported by Hull (1958). Hull interprets the results as due to students being stimulated by the wide range of differences, to older students teaching younger ones, and to teachers'

acceptance of the challenge to adapt their instruction to the widely-different needs and readinesses of children in the group.

Teachability grouping. Thelen (1963) had developed a method of setting up a so-called teachable class on the basis of assigning the teacher a group made up of students similar to those in former classes whom the teacher felt "got a lot out of class." From a controlled study of teachability grouping, Thelen concluded that the practice resulted in more manageable classes, better attainment of the teacher's purposes, and a more satisfied teacher. However, Thelen did not conclude from his study either that students learned more in these groups or that they gained greater satisfaction from being members of such groups. The choice of teachers remained a critical consideration.

INTRA-CLASS GROUPING

Teachers often subdivide their classes to facilitate instruction. Subgrouping is more apt to occur in heterogeneous classes than in ability-grouped classes since teachers employ it to accomplish within-class ability or achievement-level grouping. Such subgrouping is most common in elementary schools and is used most frequently with instruction in the skill areas of reading, spelling, and arithmetic. In a recent survey conducted by the National Education Association (1962), a sample of elementary school principals reported intra-class grouping for reading in about four-fifths of large school districts and similar arrangements for arithmetic in about two thirds of such districts. Subgrouping also occurs often in the conduct of project activities in science or social studies. Group projects and individual learning activities are more apt to involve abler students since these students are more capable of directing their own learning than are less-able students.

Spence (1958) studied intra-class ability grouping in arithmetic in Grades IV-VI. Content and instructional methods were adapted to suit the three group levels. In each of Grades IV-VI, subgroup teaching produced significantly higher achievement scores than whole-class teaching. Jones (1948) found that subgroups using individualized, nongraded materials achieved significantly more in reading, spelling, and arithmetic than the

control group that learned the usual grade-level materials with whole-class teaching. Dewar (1963) found subgrouping for arithmetic instruction in the sixth grade to produce reliable gains in achievement by the high and low subgroups but not by the middle subgroup.

Durrell and Others (1959) tested a pupil-team learning plan in which the elementary teacher divided the class into groups of two to five students who studied arithmetic and spelling team-fashion. They worked with programed materials and were required to pass the mastery test for a learning task before proceeding to the next task. Each student learned on a nongraded basis, advancing as rapidly as he could learn. In the study, pupil-team learning produced significant gains in students' achievement as compared with a control group and the plan was well-liked by pupils, parents, and teachers. Zimmerman (1965) employed another sort of pupil teamwork for the study of English in Grade IX. The ablest students in the class ran "mastery booths" where they helped less-able students learn both skills and problem solving.

Thelen (1949) proposed that principles of group dynamics should be employed in setting up a social organization for learning in the class. He recommended using a principle of least group size where the subgroup would contain the smallest number of students who had among them the capabilities required to accomplish the learning task.

The mere handful of studies on intra-class provisions for meeting differences among learners contrasts sharply with the large volume of research on inter-class grouping. Very likely the explanation is that reliance has usually been placed on structural approaches to meeting individual differences rather than on methods of adapting instructional approaches to meet such differences. In support of this interpretation is the fact that most research reports on inter-class grouping have not presented data on how instruction differed from one type of group to another. In this connection, it is significant that the most-used way of measuring classroom teaching, the interaction analysis method designed by Flanders (1960), was devised to measure teacher-student interaction in group settings without making provisions for measuring how the teacher adapted instruction to individual differences.

It appears likely that the 1970's will see a great deal of research on intra-class differentiation of instruction that utilizes new approaches to individualizing instruction. A major influence in this direction should be the programs of individually-prescribed instruction under development that have been described by Goodlad (1965) and by Lindvall and Bolvin (1967). Even more influential should be the emerging uses of electronic computers, both for individualized scheduling as described by Bush and Allen (1964) and for individualized learnings as described by Silberman and Carter (1965) and by Suppes (1967).

CRITIQUE

Writing an epitaph for grouping may well be the task of the reviewer of research on grouping for the 1980 edition of this encyclopedia. Even today it appears that grouping as a central theme of organization for instruction has nearly run its course and is in process of being replaced by a familiar theme--individualized instruction--that became a focus of educational reform in the mid-1960's.

The concept of individualization has acquired such potency that it is reducing to subordinate status even those grouping arrangements being promoted under the banners of nongrading and team teaching. A major factor in the increasing attention being given to individualization is the development of technological devices and learning programs suitable for independent study. Also, recent research has made important contributions to the growing disenchantment with grouping as a theme in organization for instruction.

It may happen also that the practice of designing, testing, and marketing new organizational plans will have gone out of fashion by 1980. Instead of adopting pre-packaged organizational plans, school systems would then design their own plans to incorporate a number of organizational themes that might include individualized programming, flexible scheduling, specialist teaching of several types, team organization, the use of teacher aides, and nongraded progression.

The research that is done during the next decade on school organization and grouping should correct a number of major shortcomings that are present in

the research studies conducted up to the present. One of these shortcomings is the failure to measure the implementation of the arrangements that are being tested. Oddly, behavioral scientists who would never neglect measuring the independent variables in laboratory studies routinely commit this error when they conduct educational field studies.

A second major fault with the research studies has been the failure to design the plan under test on the basis of an adequate theoretical model. Typically, the learning outcomes that the program is intended to foster are not specified. Likewise the requirements for implementing the plan at the point of instruction are not spelled out in the study design. The criteria used for judging the success of the organizational or grouping plan usually have been crude and often have been inappropriate. At best, nationally-normed achievement tests give rough indications of instructional outcomes. The group measures of attitudes, interests, and emotional-social factors that have been employed in the studies usually have not been validated.

The evaluation of new organizational or grouping patterns has in virtually every instance been a comparison with outcomes of conventional practices. The purpose has not been to determine how well the new practices accomplish desired outcomes but rather to determine whether they do a better job than existing practices. Had the innovators employed the research-and-development approach, they would have started by specifying the purposes the new organizational or grouping plan was intended to serve, then would have evaluated the plan in terms of its success in realizing these purposes.

A serious fault with all studies on grouping or school organization that have been conducted to date is that the study designs did not permit determining the contribution made to outcomes by each of the features of the plan under test. We need to develop designs for field tests that permit analysis of the factors, or combinations of factors, that are responsible for the results obtained. Computers can be programmed to facilitate this analysis once we have developed and put to use appropriate measures of input and output variables in the instructional program.

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