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Remediation Is No Remedy

A study conducted in Utah shows that ability grouping is harmful to remedial students.

I recently directed a research study that compared the effects of different mathematics programs on similar students. The results of this study have implications for programs designed for remedial students. Here I report findings pertaining only to the remedial students in the study.

Population and Sample

We selected three Utah school districts for this study, based on similar size, average income, and proximity to a major university. All 7th grade students in the districts were tested and observed. From among those in the same mathematics class for the entire school year, we selected 300 from each district—100 identified as "remedial," 100 as "average," and 100 as "accelerated," as determined by scores on the California Test of Basic Skills (CTBS) from the end of the previous school year. These groups were also matched according to I.Q. scores obtained from school records.

Treatment

No new program was imposed on any school or teacher; teachers in the study selected the programs they would teach. The remedial students were taught under the following programs. The teacher-student ratio was the same in all classes, approximately 30 students per teacher.

Group A: These students spent the entire school year studying mechanical skills that they had been taught earlier but had not yet mastered. No concepts beyond the standard expectations for 6th grade mathematics were presented.

Group B: These students used a standard 7th grade mathematics text but moved through it at a slower pace than the average students. The material was approximately 30 percent mechanics and 70 percent problem solving.

Surprisingly, remedial students in the ungrouped program designed for accelerated students showed significantly more improvement than remedial students in other programs.

Group C: These students spent the entire school year in a pre-algebra program designed for accelerated students. All students in the district received the same program at the same pace, with no ability grouping and no identification of remedial students, except in our records.

Procedure

We obtained CTBS scores, both general and area, for the end of the 6th grade and then for the end of the 7th grade (the year the study was made). Graduate teaching majors made and recorded classroom observations throughout the year. At the end of the year, we measured differences in achievement in computation, problem solving, and mathematical concepts among ability groups, among programs, and among teachers. We used analysis of co-variance to adjust for initial differences among the matched groups.

Findings

Surprisingly, remedial students in the ungrouped pre-algebra program designed for accelerated students

showed significantly more improvement (at the .01 level of confidence) in all three skill areas than the remedial students in either of the other programs. This result was independent of teacher or school. Apparently, while many of these students did not learn a great deal about mathematical concepts and pre-algebra, they learned arithmetic and problem-solving skills indirectly by using them in pre-algebra. In fact, they learned these skills more effectively than did those students who spent the entire school year studying them directly.

Classroom observers noted that in the classes consisting of remedial students only, students asked few questions and showed little interest in mathematics; thus the teaching mode was largely lecture rather than discussion. The students reinforced one another's attitude that mathematics could not be fun and that it was natural to dislike it. The noise levels and discipline problems in these classes were the greatest of any of the groups in the study. These classes also moved more slowly than the other groups, causing the gap between ability groups to widen.

By contrast, remedial students in group C (the mixed classes) were in classes where most of the students participated, asked questions, and seemed to enjoy mathematics. The teaching mode included more discussion. Discipline problems were minor and infrequent compared to the other two groups. Because students at all achievement levels were in the same program, these remedial students could move ahead as fast as their increased achievement allowed.

Of the 100 remedial students in the advanced program, end-of-the-year achievement tests placed 17 of them in the "average" category and 2 in the "accelerated" category. Not one student in either of the other programs was able to advance to a higher category. In fact, the gaps dividing the categories became much wider in both cases. Even those students with high I.Q.'s (above 120) in remedial programs became more "remedial" when compared to students in the other groups within the same school and district.

While many of these students did not learn a great deal about mathematical concepts and pre-algebra, they learned arithmetic and problem-solving skills indirectly by using them in pre-algebra.

What We've Learned

Many studies agree that, while ability grouping can help some students, it hurts remedial students (see Recommended Readings below).

We found that remedial students tend to learn more in mathematics programs designed for advanced students than in programs designed for remedial students. Whether the cause is the difference in materials studied, ability grouping itself, or the effect of the remedial label on the student has not been determined.

Once a student is placed in a remedial mathematics program that is quite different from the program given to other students, it is unlikely that the student will ever return to the regular classroom. This is true even when the student has been misplaced in the remedial program.

If schools use ability grouping, they should ensure that all tracks use the same basic materials and move at the same pace to allow student transfer from one track to another when appropriate. Advanced tracks should cover the material more deeply. If there is a remedial track, it should be taught by the best teachers available and in classes small enough that individual help can be given. The difference should be in the attention given rather than in the subject matter taught.□

Recommended Readings

Gamora, A. (Fall 1987). "Organization, Instruction, and the Effects of Ability Grouping: Comment on Slavin's 'Best Evidence Synthesis.' " *Review of Educational Research* 57, 3: 341-345.

Hallinan, M.T., and A.B. Sorensen. (December 1983). "The Formation and Stability of Instructional Groups." *American Sociological Review* 48, 6: 838-851.

Hiebert, E.H. (Fall 1987). "The Context of Instruction and Student Learning: An Examination of Slavin's Assumptions." *Review of Educational Research* 57, 3: 337-340.

Kulik, C.-L.C., and J.A. Kulik. (May 1982). "Highlights from Research on Ability Grouping." *Educational Leadership* 39, 8: 620.

Newfield, J., and V.B. Mcelyea. (Fall 1983). "Achievement and Attitudinal Differences Among Students in Regular, Remedial, and Advanced Classes." *Journal of Experimental Education* 52, 1: 47-56.

Slavin, R.E. (Fall 1987). "Ability Grouping and Student Achievement in Elementary Schools: A Best Evidence Synthesis." *Review of Educational Research* 57, 3: 293-336.

Slavin, R.E. (Fall 1987). "Ability Grouping in Elementary Schools: Do We Really Know Nothing Until We Know Everything?" *Review of Educational Research* 57, 3: 347-350.

Sorensen, A.B., and M.T. Hallinan. (Winter 1986). "Effects of Ability Grouping on Growth in Academic Achievement." *American Educational Research Journal* 23, 4: 519-542.

Veldman, D.J., and J.P. Sanford. (Fall 1984). "The Influence of Class Ability Level on Student Achievement and Classroom Behavior." *American Educational Research Journal* 21, 3: 629-644.

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