

## The Bay High School Experiment<sup>1</sup>

THE setting was a principal's office. The characters included a principal, several teachers, and a college professor. The subject was a cooperative research study<sup>2</sup> which was being designed by the faculty of Bay High School, Panama City, Florida. Its object: to improve their effectiveness in providing for the individual needs of their students.

Briefly, these teachers sensed they were not achieving their teaching purposes as effectively as they might. The group identified the range of individual ability in classes as being a big block to achieving purposes. The teachers hypothesized that if they could reduce the range of individual ability in their classes in English, biology, and algebra, they could do a more effective job of helping students master the subject matter, of improving their attitudes toward school, of aiding students in becoming more acceptable to themselves and to their classmates.

The entire sophomore class was ranked by ability. Odd-numbered students were then put in an experimental

group to be organized so as to *reduce* the range of individual differences as much as possible in each class in English, biology, and algebra. Even-numbered students were placed in a control group so as to *increase* the range of individual differences as much as possible. There are approximately 250 pupils in each group. In the experimental group the top 30 students in a particular subject made up one class. The next 30 students made up the next class and so on down the line. In the control group each class was developed to contain a balance of exceptional, average, and below average students.

All students were given standardized achievement tests in the particular subject at the beginning of the year and were given another form of the same test at the end of one year. A sociometric instrument was used to evaluate the way the students felt about each other in the various classes and was again administered in May. To determine whether or not there were any significant changes in the way the students accepted themselves and others, the Index of Adjustment and Values was employed. Finally, a student attitude questionnaire was developed and used to determine changes in students' attitudes toward their school situation in the areas: (a) degree of learning; (b) student behavior, (c) student

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interest in subject, (d) work on subject outside of class, (e) friendliness of students, (f) teacher interest in subject, (g) teacher interest in students, (h) honesty of students, and (i) learning needs of student met in subject.

An attempt was made to keep within rigid experimental controls. The grouping situation was specific and every effort was made to control the variables of scholastic aptitude and achievement. After the experimental and control groups were formed, F values were computed by the analysis of variance. The values did not approach significance. The time between the initial test and retest was held constant for the experimental and control groups. To control the quality of teaching variable, sections included in both groups were taught by the same teachers. It was assumed, therefore, that any significant differences found in the two groups could be attributed to the grouping situation.

1. *Comparison of subject matter mastery of the control and experimental groups:*

Comparison of the subject matter gains of the experimental and control group in the subject areas of English, biology, and algebra was achieved through the employment of the analysis of variance, analysis of co-variance, and the *t* statistics. Results indicated that the experimental group made greater gains in English than the control group. The *California Language Test* results showed that the experimental group had a mean grade placement gain of 1.29 compared to the control group's mean grade placement gain of 1.04. This difference was significant beyond the .05 level.

Differences in gain of the upper third of the students were even greater. Mean gains of 1.63 for the experimental group and 1.18 for the control group were re-

corded. This difference is statistically significant in favor of the experimental group beyond the .01 level of confidence.

The difference in the mean gain of the lower ability classification was not statistically significant.

Analysis of the *Cooperative Literary Appreciation Test* did not indicate statistically significant differences between the experimental and control groups.

In biology, no statistically significant differences were found between the two groups. It is interesting that a *t* value of 1.04 was obtained in favor of the experimental group for the upper  $\frac{1}{3}$  of students whereas a *t* value of only .37 in favor of the experimental group was obtained for the lower  $\frac{1}{3}$  of students. A value of 1.96 was required for significance at the .05 level of confidence.

The comparison of the two groups in algebra by the *t* test revealed no statistically significant differences. The differ-



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ences that were indicated were in favor of the experimental group and the upper  $\frac{1}{3}$  of the experimental group.

#### 2. *Comparison of acceptance of students by classmates:*

A sociogram was administered to the two groups at the beginning of the school year and at the ending of the school. The Mann-Whitney U statistic was used to determine the significance of difference in gains of the two groups. No significant differences were found.

#### 3. *Comparison of acceptance of self and others:*

To determine whether or not there had been significant changes in the control and experimental groups with respect to students' acceptance of self and others as measured by the Index of Adjustment and Values, the chi square statistic was used. Again, no differences were evident.

#### 4. *Comparison of student attitudes toward their school situations:*

In the English sample the experimental group felt their teachers were more interested in teaching English. This difference was statistically significant at the .01 level of confidence. No significant differences in student attitudes were found in the algebra groups. In biology significant differences in favor of the experimental groups and meeting the .01 criterion were obtained on items of student learning, student interest in subject, teacher interest in subject, teacher interest in students, and learning needs in biology being met. Significant differences meeting the .05 criterion included the items, student friendliness and student honesty.

The conclusions of this study are really a progress report, since the study was designed to cover a five-year period. However, it is felt that certain findings even at this early date have strong im-

plications for hypothesizing about grouping procedures.

The hypothesis that students would make greater academic progress when grouped according to reduced range of ability was sustained by the findings of this study only in the case of the English classes. There were no statistically significant differences in the algebra and biology groups.

Indications are that grouping children in reduced range of ability groups as it was done at Bay High School has no statistically significant effect on the acceptance of students by their classmates as measured by the sociogram used, or the students' acceptance of self and others as measured by the Index of Adjustment and Values.

The experimental group developed a more positive attitude toward their school situation. This was especially true in the biology classes. There were no statistically significant differences in the algebra classes and only one in the English classes, but all the differences were in favor of the experimental group.

One interesting observation of the results is that the F value for the upper  $\frac{1}{3}$  in the experimental group was substantially higher in all cases than the lowest  $\frac{1}{3}$ . The higher ability students profited more from the reduced range of ability grouping. In no case did the lower  $\frac{1}{3}$  in the experimental group profit more.

One significant factor in the Bay High School situation was that the teachers had a strong bias in favor of the reduced range of ability grouping at the beginning of the year and still had this strong bias at the end of the year. There is no way to assay the effect this might have had on the results of the study.

—JOHN T. LOVELL, *associate professor of education, Auburn University, Auburn, Alabama.*

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