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## THE QUESTION OF LARGE CLASSES IN COLLEGE TEACHING

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I approach the subject "Large Classes in College Teaching" with some caution, knowing full well that most college professors can *rationalize* on size of class quite readily.

During the last 12 months I have discussed the problem of large classes with several college teachers. It may be that I have not taken a sufficiently large sample to draw conclusions of high accuracy, but nevertheless here is the pattern.

1. Most instructors associated large classes with increased teaching load.
  2. Most instructors were educated in small classes.
  3. They were trained to teach small classes, in so far as they were trained to teach at all.
  4. Their teaching experience had been with small classes.
  5. They had acquired faith in small classes.
- No wonder they could "rationalize" on size of classes.!

The question appears too important to be left to opinion based on such biased experience. It can only be settled after every reasonable effort has been made to adapt teaching procedure and teaching personnel to large class situations.

Why is the question of large classes important? Why not let well enough alone? If enrollments continue to increase in our colleges, and if competition for adequately trained personnel becomes keener, the business managers of our educational institutions will have need for new economies. Perhaps the greatest weakness in our college lies in the set of rules governing the traffic in Curricula.

I maintain there is an excessive offering of courses. This excess can be reduced by:

1. Removing duplication of courses
2. Increasing the size of the class

Both intradepartmental and interdepartmental duplication exists. If an educational accountant were called in to survey the economies of our college he might reveal abundant opportunities for the improvement of business methods. However, it would take a crisis to bring about some of the things he might recommend. To solve some of these educational problems it may be necessary that the classical conception of autonomous divisions and water-tight

departments give way to an organization which will coordinate the functions of our institutions.

There are several theories and definitions in our educational system that must be reevaluated before any discussion of class size can be fruitful. I shall consider only a few.

I. Is the percentage of teaching time now being absorbed by non-teaching activities justified?

Universities have reduced the traditional teaching load on the assumption that the members of the staff should be engaged in creative work or advanced study. This is an essential and wholesome policy in the development of a university. The conscientious, competent, open minded instructors—and there are a few even in college—desire a part of their time for introspection and modest research in order that they may improve professionally. An adequately prepared instructor when not doing administrative or research work has a fairly easy job teaching 12 to 14 hours a week. Many outstanding teachers with ability and competence in the organization and presentation of material would gladly increase their teaching load if it were accompanied with recognition of good teaching, the furnishing of better facilities for work, and the removal of administrative duties and details. It is a shameful misuse of human resources to allow the most scholarly teacher to waste his time in small units of competitive introductory courses, or to weight him down with administrative details, or both. Is the percentage of time now being absorbed by non-teaching activities justified ?

II. Do we *teach* too much?

The theory that everything to be learned must be taught is uneconomical, unpedagogical, and a violation of the principles of a sound philosophy of education. The student, going beyond the general introductory course into a broader field of higher education, should be thrown more and more upon his own resources. A spoon-fed student will find himself improperly conditioned for many of the conflicts in which he will have to engage in order to prepare himself for tomorrow. It is felt by many, I am sure, that the function of a university is to provide the facilities which will be an incentive for self-education. If this is the correct function of the university, then should not the instructor play a supplementary role rather than a predominant role in one's education? Let us sever the umbilical cord between teacher and student as soon as possible. The cultivation of the principle of self-help in accordance with the practice of many of our progressive universities would eliminate from the courses offered those subjects which students can pursue most effectively by going to original sources, organizing their own thinking, and working in small groups under their own initiative. This would result in a wide spread of achievement in proportion to natural ability, which in many respects corresponds to what will happen later in life. It certainly is a necessary condition for scholarly attainment. So again I frame the question—do we *teach* too much?

III. The theory of the advantages of a small class.

Whether we increase the teaching load of instructors or whether we reduce the number of courses, we should consider a movement to organize fundamental courses in larger and larger units each headed in some way by the most inspiring scholar and teacher in the department. I wouldn't be surprised to find that the theory of small classes originated in the nursery, and that it receives its greatest support and intensive cultivation from those teachers who are not leaders. The school is indeed fortunate that can boast of more than a few great leaders and great teachers. If small classes prevail a very small percent of the students will have the opportunity of coming under these truly great leaders. This unintentional discrimination is hardly in line with our idea of equal opportunities, but it appears inevitable as long as small classes prevail. As I look back, I would rather have been a student under

Dr. Gundersen in Mathematics, Professor Burris in History, Mr. Snedecor in Statistics, or Dr. Schultz in Economics, in classes of 300 than to have been pigeonholed for even a short time in each of these departments in small classes of 15 or 20 in a stale atmosphere wherein the underpaid instructor considered it necessary to give by word of mouth those facts and propositions which were already well stated in the textbook. Large classes may effect an economy which would permit an institution to hold their great teachers and attract others, or as far as that goes, permit the development of those potentially great young teachers already in our grasp. At the present time approximately three-fourth of the teaching is being done in the lower division courses; thus, only one-fourth of the facilities of the physical plant and the corresponding proportion of the energies of the faculty are available to students at a purely university level; and as long as the lower division students continue to be assigned to classes of 30 or less there seems to be no relief for this situation. Increasing the size of classes offers an obvious and tempting means for immediate educational economy.

#### IV. What is the role of the instructor in college teaching?

Certainly one of the functions of the teacher is to motivate by such procedures as outlining the specific things that the student must learn, keeping some sort of a check on the students, and fostering a spirit in the class room which will promote and develop an appreciation, and, if possible, an enthusiasm for the field of study represented by that subject. To what extent is it the function of the teacher to watch and measure the unfolding process of the student and to guide that student as an individual growing organism? Must we, as teachers, revert to individual counseling and tutoring? It is my opinion that the students in a large group under a great teacher will obtain more vital personal contact, guidance and inspiration, than the students in smaller classes will obtain from the average college teacher. The effectiveness of personal association between student and instructor varies far more with the instructor's power of leadership and methods of keeping students at work than it does with the size of the class. If a large class is to be as effective as a small class it may be necessary to radically revise our present classroom practices of content lectures and drill sections by the substitution of more appropriate methods of class room management.

I am sure that the committee that invited me to speak had hoped that I, being an experimental statistician, might be able to indicate an experimental design with appropriate statistical analysis which might shed further light on the relative merits of large and small classes. I find myself at almost a complete loss to present such an experiment. When seeking the professional assistance of the consulting statistician, the researcher should have many things clearly in mind: first, the objective of the experiment must be defined in unmistakably clear language; the experimental unit he expects to use must be clearly defined; the method and units of measurement which he intends to use must actually measure the characteristics being studied. If you merely intend to describe what happened in your experiment and not infer what to expect if the experiment is repeated on a similar population you need only the classical statistics for the reduction of such data. If you intend to make inferences from your experiment you must clearly define and limit that greater aggregate of experimental units. Many assumptions will need to be made—these assumptions should be rational and realistic. Appropriate analysis will be necessary. The old saying "You can prove anything by statistics" has been changed recently to the statement "You can't prove anything by statistics". Whenever you have a study involving characteristics that vary you always have a degree of uncertainty. It is only that a statistician by appropriate design and analysis may minimize this uncertainty. In the studies of class size that I have reviewed in the literature I have found very little agreement on how to measure the products that they were trying to compare. The exponents of the theory of small classes claim whenever no significant differences between class sizes are found, the experiment has failed to consider those advantages which can be obtained more easily by small classes. Most of

these stated advantages were beliefs that do not lend themselves to statistical measurement. For an example, how would you measure the inspiration that a student receives from an instructor? The traditional studies of class size, most of which were made some two decades ago, sought to measure the effects of class size by subject matter achievement. Many educators believe that subject matter achievement is a minor part of a college education. Incidentally most of the experiments on class size that I reviewed where subject matter achievement was used as a criterion indicated no significant subject matter difference. I withhold judgment on the accuracy of these experiments.

Some of the questions to be answered by a planned experiment on class size are: Will relative results in large and small classes be the same for (a) all students, (b) all subjects, (c) all teachers, (d) all methods of instruction? If not, what are the critical factors in class size? If mass instruction is not possible, what are the characteristics of those students who deviate significantly from the mass? What subjects lend themselves to large class techniques? If certain instructors are found to be capable of handling large classes, what is it about them that enables them to do it? If some teaching procedures are found to be peculiarly adapted to large classes, can we train our instructors to use these procedures? Do the practices necessary for the success of large classes impose unreasonable demands on teachers or students, and if so, is it possible to compensate for these unreasonable conditions? To conduct an experiment in such a way that answers to the preceding problems can be found would require a well-planned, extensive and expensive experiment requiring effective controls of the many variables present. It is also worth noting that some of these variables cannot be impounded while we study the others. A most difficult problem in such an experiment would be the finding of proper techniques of measurement to which statistical analysis could be legitimately applied. Another difficult problem is an acceptable outline of the objectives of an education, and then I think before the final word "go" were given to conduct such an experiment, that the personnel, including management, who would be affected by the findings of such an experiment, should be willing to abide by its findings. I am sure that you agree with me that none of these problems mentioned above is easy.

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