

Appendix E: An Option for Intellectual Autonomy

What it means

It is an Option because students would volunteer for it. Intellectual Autonomy means that students will be encouraged to think for themselves, start to guide their own lives, and become self-motivated to study. It is based on the idea that “all work and no play makes Jack a dull boy” only if the work is externally imposed so that it becomes drudgery. Most of the world’s great men and women are usefully active all the time, but few of them say they are “working.”

To whom it applies

It is to apply to M.I.T. undergraduates, who are a uniquely qualified group. I will cite a few statistics in order to confirm the common opinion:

(1) Academically, the upper half of an entering class at M.I.T. is drawn from a group comprising less than the highest one percent of those U.S. high school graduates who go to college; between five and ten percent of this elite group enter M.I.T. (depending on which College Entrance Examination Board test score one looks at). Stated in more commonly meaningful but less exact language, the median I.Q. of entering M.I.T. freshmen is about 150, and there is probably no freshman below about 130.¹

(2) Personality, the mean “Omnibus Personality Inventory” scores for entering M.I.T. freshmen differ from the National Averages mainly in that the M.I.T. students are significantly more given to scientifically oriented habits of thought. Neither the fraction of “hippies” nor the fraction of rigid conservatives is higher at M.I.T. than at other colleges.¹

(3) Motivation for Going to College, entering M.I.T. freshmen are more typical, in the reasons which they give for going to college, of those who enter liberal arts colleges rather than of those who enter engineering schools. A significantly larger fraction come to M.I.T. in order to become learned, than is the case for students entering all U.S. colleges.¹

There is no other university which has simultaneously such large numbers of gifted students comprising such a large fraction of its classes. Other universities have large numbers of gifted students comprising small fractions of their classes (e.g., Berkeley) or small numbers comprising large fractions (e.g., Caltech); but in most institutions there is only a tiny minority (a few percent at most) of such students.

The problems

M.I.T. clearly has a national responsibility therefore to lead the way towards a more flexible education of gifted students. (In the opinion of a sample of the M.I.T. Faculty, M.I.T.’s educational methods are deficient in that they inhibit curiosity, work the students too hard, and are otherwise repressive.²)

The less important problems

(1) Because the quality of exposition by the M.I.T. faculty is relatively high compared to that of teachers in other colleges, improving teaching does not seem to be a problem which requires a great deal of additional effort (although M.I.T. should, as a separate endeavor, maintain some kind of unit for training young teachers in verbal communication).

¹Cf., Sections A and B of “Reference Manual, The Freshman Year at M.I.T., Classes of 1968, 1969, 1970.”

¹Cf., Sections A and B of “Reference Manual, The Freshman Year at M.I.T., Classes of 1968, 1969, 1970.”

²“What 45 Members of the M.I.T. Faculty Seem to Like or Dislike About M.I.T. Undergraduate Education.” by G. E. Valley, March 1, 1968.

(2) Because good books exist and our staff willingly continue to compose newer and better ones, this also is not a problem area which requires increased encouragement (although some new texts might nevertheless come out of the new program of education described below). Similar remarks apply to movies, programmed learning, etc.

(3) Nor is there an urgent need to devise new kinds of classes in which a single teacher interacts with students: all combinations of discussion groups, lectures, tutorial sessions and so on have been tried already, and with consistently fuzzy and inconclusive results. All that can be said is that students uniformly want, and say they enjoy, very small classes. I shall propose therefore to utilize this enjoyment in the furtherance of the intellectual autonomy of the student.

There is good reason to doubt the efficacy of recitation sections and I propose a plan which might eventually involve giving up recitation sections and using the space, faculty time, and other resources thus made available to support the new methods. In this way the cost of the new methods might be kept within M.I.T.'s present budget for undergraduate education.

The following are the more important problems:

(1) The syllabuses are too rigid, and suit neither the most able nor the least able students. At the present time syllabuses are devised according to someone's conception of what a typical student ought to be taught. This is probably true in all schools, but only at M.I.T. is there an urgent need to more flexibly educate such large numbers of gifted young men and women. This proposal is based on the idea that the "typical student" comprises only a minority of the M.I.T. student body.

(2) There is too much emphasis on teaching the student rather than on the student's learning for himself. This means that it is the teacher who tends to be active whereas the student tends to sit passively. It is particularly important for highly able students to learn to be active participants in their own education.

(3) Students tend to become "syllabus bound." This is one of the most important problems because the U.S. school system habituates students to study what they are told to study when they are told to study it. As a result, they come to college expecting to be led by the nose, and this is what M.I.T. and most of the other colleges tend to do with them. In most colleges students meet for the first time teachers who are smarter than they are themselves; the caliber of M.I.T. students is so high that we need to modify this statement: M.I.T. freshmen meet for the first time teachers who are as smart as themselves. It is because practically all our incoming students have for all their lives been pushed around by comparative dullards, that we can hope to guide them into the responsible use of intellectual freedom.

(4) Students tend to become incurious, because even if not actually overworked at M.I.T., they nevertheless have so much material to absorb that they lose their appetite for more. Einstein's famous remark about satiating the tiger's appetite is relevant.

(5) Students tend to become intimidated and afraid to express opinions, or to ask dumb questions in class; and they are otherwise subdued.

(6) The well-publicized problem of the "obsolescence of engineers."

(7) The faculties of many colleges, including M.I.T.'s, worry that students are insufficiently "creative;" that they have poor taste, whether it be artistic taste or scientific "taste;" that too few students have ever examined their own motivations.

Objectives of the Proposed
"Option for Intellectual Autonomy"

The objectives are of course to solve or remedy the problems. At the present time many educators seem to believe that only those educational objectives are valid which can be clearly stated and whose attainment can be objectively assessed. This may be true for those subjects of instruction primarily concerned with techniques; it cannot be true for those objectives which may be highly desirable but which are inherently a matter for individual judgment such as “taste,” or for objectives the attainment of which can be objectively tested, but only years after graduation, such as “non-obsolescence.”

The following list of objectives is ordered approximately in harmony with the above list of problems, and the immediately testable objectives are marked with an asterisk (*).

(1) To allow students to learn, each at his own pace: “A” students would cover more than the normal syllabus; “D” students would cover less but learn it more thoroughly (*).

(2) Students would be encouraged, even forced, to learn—they could attend lectures, take exams, etc., etc., or not, as they chose; but each would be examined regularly, although informally by a staff member; there would be seniors and graduate students to go over problem sets with each student individually. The idea is that the student would be given, for each subject of instruction, only a list of topics, and references to a few carefully chosen books of graduated difficulty (*).

(3) Students would be referred to several texts and each student would be required to study a given subject from several books (*).

(4) Students would be encouraged to formulate original homework problems and to ask questions in face to face contact with teachers (*).

(5) There would be “freshmen colloquia” attended not only by freshmen but also by the student teachers and the staff. These would mostly be on “open-ended” subjects. Freshmen might give one or two short talks at each session, and then there would be general discussion. In order to encourage freshmen to speak up, there may need to be rules to prevent their superiors from downing them. Such a set of rules might be something like the following: Freshmen would be allowed to question everyone; student teachers could only question faculty; and faculty could only answer when asked by a student or could question one another in order to be invited by the students to participate (*).

(6) By putting the emphasis on “learning” rather than on “teaching,” the student would be put into the habit of educating himself from the start. It is hoped that this habit once acquired would stay so that he would continue to consult books and attend (and give) lectures freely the rest of his life. He would therefore be able to avoid “obsolescence.”

(7) “Grading” would be by faculty approbation, e.g., by smiles, cordiality, and other such marks of approval—as much as possible like real life. The homework tutorials would be regarded as part of a “weaning away from needing to be taught” (*).

The student would learn by whatever means suited him best (including, but not limited to, lectures, recitations, written exams, etc.—which he might or might not attend—we wouldn’t care how he learned as long as he did learn) (*).

All this, in my view, should be done in a structured rather than a permissive atmosphere—and students should be allowed to give up their tutorials based on their individual attitudes and progress, as informally assayed by the teaching staff. Such students would continue to have weekly interviews with a faculty member however.

The supporting of creative impulses, the inculcation of good taste—both cultural and scientific, the encouragement of self-examination are all desirable objectives.

Although I do not see how the attainment of these can be assessed, I nevertheless believe that the M.I.T. faculty is competent to exemplify these qualities strongly enough so that students will rub some of

them off.

The overall principles behind these objectives can be summarized as follows:

(1) M.I.T. should create an atmosphere of learning which is conducive of self-disciplined autonomous intellectual effort by the student.

(2) M.I.T. should experiment with all kinds of classes (including those with more than a single teacher present—which has rarely been tried) in order to see if some methods suit only some kinds of student, and, if so, to find out how to help students discover their own best methods.

(3) M.I.T. should show students how mature men and women behave and how they reward one another in the real world.

Proposed procedure

Phase 1: This would be a joint student-faculty study group to convene in the Fall of 1968 for the purpose of modifying and detailing the foregoing.

Phase 2: This would be a fumble-stumble period, possibly starting with a few freshmen in January 1969, for the purpose of seeing if any of the plans should be tried out more seriously on a larger scale.

Phase 3: This might start in the Fall of 1969 with perhaps 25 entering freshmen. If successful, it might be continued and enlarged.

All would be subject to periodic Administration and C.E.P. review.

Methods, and estimated costs

An instructor who gives two 25-student recitations per week will typically spend a total of 10-12 hours/week on this duty—preparation, grading, and counseling included. If recitations were abolished, then an equivalent amount of faculty time could be utilized as follows: On the above basis he could alternatively interview about 10 students one hour each week (possibly seeing two students simultaneously) seeing any particular student at least once every four weeks for the purpose of general technical conversation, exposition of principles, and forming an opinion of the student's progress and ability (problems would be corrected and explained by seniors or graduate students, who would meet each student each week). If the student took four subjects, he would have a single interview with a professor each week, seeing each individual professor three or four times per semester as well as informally; each week he would also have four one-hour tutorials with student teachers. Thus the professor would supply technical and other kinds of understanding and also approbation; this would require only a small amount of preparation on the part of the professor.

This means that Phase 3, which would have only about 25 students, would be twice as expensive in faculty time per student as physics and humanities now are; if the plan were more widely used, the faculty load in those subjects would be about the same as now. Subjects which now employ graduate students as recitation instructors would be more expensive this new way.

Incoming freshman students would be given a prospectus, and would volunteer for the experimental college, knowing beforehand its risks as well as its potentialities. They might sign up for a curriculum of their choice just as now, but could leave the standard system prior to the first hour exam or theme.

The principal added costs would be in Phases 2 and 3 which would involve several thousand square feet of space, payment (if necessary) of student instructors, purchase of several hundred books (including autobiographies and other less technical works of great men—from Alfred Sloan and Theodore Von Karman

through Darwin and Poincare; there may also be need for a shelf of great novels which are also fun for adolescents to read. There will have to be lots of copies of about two dozen standard texts.), computer time (for those who find computer instruction to their taste), movie facilities, etc. It is hard to see how this could add up to more than the current Institute expenditure per freshman—e.g., about \$100,000 for 25 freshmen. (However during Phases 1 and 2 this would have to be additional money.)

In principle this kind of plan can be successful economically in the long term whenever there are sufficient students to fully occupy the time of a professor; this is the only reason that I can see now why, if this works for freshmen, it can't be extended for all students who desire it (there is a little questionnaire evidence that as many as half the undergraduates might want to try this).

It is not contemplated that all undergraduates would ever be educated this way—a large fraction of our undergraduates are content with the present system.

G. E. Valley
April 17, 1968

Appendix F

Here are a few of the many questions I received from members of the Committee on October 3, 1968,¹ together with my answers.

“What sort of students will the Experiment appeal to?”

“What sort of students will benefit the most from it?”

Ans: It is easier to define who won't be interested: namely, the play-it-safe type who is interested in making a career out of having a career.

“How many students?”

Ans: Between 25 and 50

“Should the use of computers, films, tapes, television, etc. be emphasized?” Ans: They should be used when convenient and desirable, but we should not emphasize their use as a special feature of the Experiment.

“How is the erratic but creative student to be handled?” “How encouraged?” Ans: By exercising patience and forbearance with him, I suppose.

“Will the Experiment have an identifiable center but use the classrooms and laboratories of the Institute as departments do now?” Ans: It should under no circumstances use regular classrooms or seminar rooms; much of the teaching ought to be informal.

“Except for Academic Programs will students in the Experiment live as other students live?” Ans: Yes; I am against total institutions.²

“What system of rewards can substitute for the ‘satisfaction of a good grade?’” Ans: What is the “satisfaction of a good grade?” The student should be allowed to make a good reputation; he needs approbation both from his peers and from his teachers.

“Should there be formal examinations?” Ans: Certainly not the kind we give now in which all the students are herded into big rooms.

“Is the immersion of the student in an atmosphere of intellectuality, to manipulate him? If so, is this bad?” Ans: If manipulation means coercion then it's bad because coercion is bad... How free can you get and still associate with other people?... I am against deliberate indirection, but no one can promise to be tactless all the time.

“Will students' speeches be so dull as to turn off their student audiences?” Ans: If students' speeches are dull, we will show how to make interesting ones.

“How much time can an individual faculty member give to this enterprise?” Ans: On the average no more than he now devotes to undergraduate instruction; however in some fields there might be more contact hours and fewer hours at home spent on this.

“As residents of Boston or Cambridge, what are the responsibilities of the Experiment and of the students and professors to the larger communities of which they are part?” Ans: The same as they are now.

“What is the name of this enterprise?” Ans: I don't know—clearly it is an “experimental” something.

¹G.E. Valley, “88 Questions about the Experiment,” report to the members of the Experimental Study Group, October 4, 1968.

²Erving Gottman, “Characteristics of Total Institution,” in Report of the Symposium on Preventive and Social Psychiatry, Walter Reed Army Institute of Research, Washington, D.C., 15-17 April 1957. I had just finished reading this paper when I answered the question.

“For how long will it continue?” Ans: I don’t know—if it is a success, then it ought to continue indefinitely.

“What sorts of things might happen outside of the Experiment in which members of the College might participate?” Ans: All kinds of things.

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