

# TRAINING OF FOREIGN GRADUATE STUDENTS- Problems And Solutions\*

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Recent years have witnessed a growing influx of foreign students, graduate as well as undergraduate, into the United States. In 1950 there were only 34,000 foreign students enrolled in American Universities. In 1971 that number stood at 145,000—a fourfold increase in twenty one years. Last year graduate students not only accounted for nearly forty-five per cent of the foreign student population (Open Doors Report for 1971, Institute for International Education, 809 UN Plaza, New York, N. Y. 10017) but also constituted an estimated ten to fifteen per cent of the total number of graduate students in the country. From either point of view the number is large enough to warrant and justify a debate on the problems encountered during their training and possible solutions to these problems. In this connection mention must be made of a study being conducted by the United Nations Institute for Training and Research (UNITAR) on the development and use of talent through training abroad. A detailed questionnaire is being distributed to nearly 20,000 students and professionals in twenty countries. Upon completion the study should make significant contributions to improving the educational and employment situation in many countries.

In the following discussion we shall confine ourselves to foreign graduate students in the engineering fields, with special emphasis on chemical engineering graduates. Needless to say, some of the discussion will apply equally well to foreign graduate students in other fields such as physical and life sciences, social sciences, humanities and education. One category of graduate students, by and large, excluded from the discussion includes grantees sponsored by United States or foreign governmental and educational organizations and

foundations. These students have definite educational, financial and return plans. The problem of graduate medical doctors are peculiar and are also excluded.

## PROBLEM CAUSES

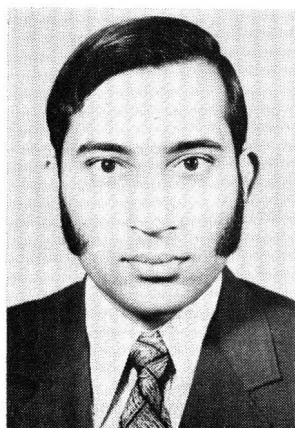
Statistics reveal that nearly ninety per cent of foreign students come from Asia, Latin America and Africa with different cultural and social backgrounds. To say that they suffer from a 'cultural shock' upon arrival in the United States would be an exaggeration. Their need for some adjustment, however, is real. The process of adjustment can be facilitated by a clear and sympathetic understanding of their problems and a non-discriminatory approach towards their solution.

The problems encountered in the training of foreign graduate students stem from several causes:

- The increasing number of foreign students seeking graduate training.
- The rising cost of training and living.
- The deficiencies in their undergraduate curricula.
- The necessity of returning to their home countries at the conclusion of their training.

**Growing Demand for Graduate Training:** There are many reasons why increasing numbers of foreign students desire graduate training. Some of the motivating factors are the same as those which influence students everywhere to seek graduate training. Foremost is the realization that a four or five year undergraduate program cannot adequately cover the large and diverse body of knowledge required for creative work. In addition to the greater knowledge to be acquired, there is increasing impetus to apply more advanced methods in the solution of problems. Economic advantages accruing from a

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graduate degree are also an important consideration. Other motivating factors are peculiar to foreign students. The educational system in underdeveloped countries, in particular, is inadequate to provide advanced curricula in specialized fields. Very often returning foreign graduates find themselves elevated to higher social status. In a few cases, foreign graduates prolong their graduate studies merely to tide over unemployment and visa status problems.

Presumably, the factors outlined above will continue to operate and increasing number of foreign students will continue to seek higher education. An immediate offshoot of this trend will be the need for a rationalized basis of selection. Furthermore, not all of the incoming foreign students can receive adequate financial support and this brings us to the financial aspect of the problems of training foreign graduate students.

**Financial Problems:** The cost of training, like the cost of living has risen substantially over the years. Its impact is particularly severe on foreign

students from developing countries whose standards of living and per capita incomes are considerably lower than those of the United States. The rates of foreign exchange between these countries and the United States only serve to compound the problem. To cite an example, four thousand dollars (which is a reasonable estimate of annual expenses for an individual student here) amount to nearly thirty thousand rupees in India at the official rate of exchange. An engineer fresh from school, in the United States can earn that amount in, perhaps, five months. In India, it would take nearly five years for him to do so.

For most foreign students, then, financial considerations are of paramount importance. Unless they receive some sort of aid from the schools they attend or from their governments, they are compelled to seek part time employment elsewhere. Current economic cutbacks and stricter enforcement of Immigration Service laws, however, make such part time employment a difficult proposition. But, the adverse effects on their studies are easy to see.

**Deficiencies in Undergraduate Curricula:** Two of the main shortcomings of the undergraduate curricula of foreign students stem from lack of financial resources. These relate to the use of the digital computer and the use of workshop tools and machinery. Another deficiency arises from their educational system itself which places inadequate emphasis on the problem-solving approach so essential in the training of engineers and technologists.

Deficiencies in the use of the English language by foreign students cannot realistically be attributed to shortcomings in their undergraduate curricula since very often they receive instruction in their native languages. Nevertheless, these deficiencies must be recognized and eliminated if the students are to make the most of their formal education and training in the United States.

**Forced Return to Home Countries:** Foreign students are normally granted training visas for a period of twelve or eighteen months at the conclusion of their studies if they gain meaningful employment in their fields. They are then required

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to return home unless they change their status to that of permanent residents. In view of the current tight job situation, their prospects of gaining meaningful employment which will enhance their professional abilities are not very bright. Recent restrictions on the granting of permanent residency visas have served to make matters worse because employers are understandably reluctant to hire those who can stay in the country no longer than eighteen months after graduation. This state of affairs also adds to the financial problems of foreign students who see little chance of recovering the huge investment they have made in their education as graduates.

#### **POSSIBLE SOLUTIONS**

The selection of foreign students for graduate training should be placed on a more rational basis. The results of the Graduate Record Examination are not always reflective of the ability and caliber of foreign students. The judgment of the Admissions Committee is subject to considerable error because of its inadequate knowledge not only with regard to the grading system in foreign universities but also with respect to their educational standards. It is suggested that a central advisory pool of educators be set up either in the United States or in the foreign country. This pool should be constituted by people familiar with the standards and the grading system of foreign universities and applications for admission to United States schools may be channeled through the pool. The pool can then rate each student and pass the information onto the concerned school.

Once a student is admitted for a graduate degree program, he should be given a placement examination to determine his deficiencies, if any, in the basic courses. His graduate program can then be suitably modified. He should also be given tests to determine his ability to use the English language and if necessary, be required to take special courses in English.

A course on the use of the digital computer should be made an integral part of his program. He should also receive instructions and training in the use of workshop tools and machinery.

Departments which require a thesis as part of the MS degree program might consider offering students a design option as an alternative to investigative research. A design oriented thesis is likely to be of more immediate value to the foreign student. The feasibility of initiating graduate co-op programs and placing students in the MIT like practice school should be examined.

Understandably, universities can do little to alter the job situation or the immigration laws of the country. Nevertheless, they can and should exert greater efforts in finding meaningful employment for their foreign students especially those who cannot stay long in the country. Such students may be prepared to work at lower salaries in order to receive the kind of training they desire. For morale purposes, however, their salaries should be treated as stipends and they can be viewed as a special kind of industrial apprentice, possibly with tax exemptions. It might be possible to establish a central clearing house for all such applicants. The benefits of such a program are obvious. The employer gets a fully qualified professional to work for him at a reduced 'salary' and the professional receives the kind of training he desires before he returns to his country and still gets paid for his efforts. It might be mentioned here that a National Program of Industrial Internships in Physics and Astronomy, financed jointly by the federal government and industry, has recently been proposed by the American Institute of Physics (Physics Today, June 1972, page 66).

To summarize, foreign students and their training present peculiar problems which deserve serious consideration and support of efforts toward their solution. We have made some suggestions with regard to their solution which require close cooperation among universities and interaction between industry and the universities. We hope that such cooperation will be forthcoming in order that the training of foreign students may become more rewarding not only to themselves and their countries but also to the universities where they study and the country they visit.

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