

# International Training's Present And Future: Implications For Land Grant Universities

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*"In no country today does education correspond sufficiently to the reality of world conditions, events, and issues. Given the nature of the contemporary world and the foreseeable future, every educational system should reflect much more adequately than it currently does such matters as the unity and diversity of mankind, the interdependence of nations and peoples, and the need for international cooperation in shaping an acceptable future."* [14, p. 6]

## Introduction

Colleges and universities in the United States have welcomed foreign students for training for many years. Training for those students, as well as for our own, is normally assumed to be consistent with Leestma's view of global education. It is often argued that such an international dimension adds to, rather than detracts from, traditional university functions [5]. Foreign students not only benefit directly from an internationalized education, their presence on our campuses provides the diversity and richness on which such an education should rest. Within this concept of global education in an ethnically and culturally diverse world, we discuss international training and its future implications for land grant universities.

In this paper, international training means all degree and non-degree training at U.S. land-grant institutions for students who are not U.S. citizens or immigrants (permanent residents).

Both undergraduate and graduate studies are included. The arena defined includes experiences ranging from short-courses of a few weeks to formal degrees requiring several years. Education and training are not differentiated since the global context should apply to both. Obviously, a four week short-course stressing a particular skill may not provide as much in global concepts as a three year Ph.D. program. However, one should not assume that a better job of global education is achieved just because the student stays several years.

This paper reviews a number of recent studies of international training at U.S. universities, emphasizing land grant institutions. We then speculate on the future of such training and its likely implications for our universities.

## Trends<sup>1</sup>

Enrollment in agricultural majors is declining across the land grant system. Mandersheid [15] reports a decline of 35 percent in the last decade. Foreign student enrollment in agricultural sciences has followed a similar path, declining

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<sup>1</sup> Material in this section from either Cummings [4], Zikopoulos [24] or Hively [8] unless otherwise noted.

at 1-3 percent annually from 1982 to 1987 [24].

Only in the most recent year of record was this downward trend interrupted. In 1987/88, there was a ten percent increase in foreign student agricultural enrollment and a 20 percent jump in graduate level, non-degree training.

Foreign students comprise a small fraction (less than 3 percent) of college students in the U.S. However, viewed from the perspective of graduate programs they are more significant. Foreign students account for eight percent of all masters degrees and fifteen percent of doctorates nation wide [22].

These proportions can be much higher in land grant universities as shown in Table 1. Over thirty percent of the 1987 doctorates earned in agricultural sciences were by foreign students. Agricultural engineering, agronomy and agricultural economics, the core disciplines of agricultural

**Table 1: Fiscal Year 1987 Doctorates in Food and Agriculture Sciences at U.S. Land Grant Institutions.**

	Total	Foreign	Percent Foreign
Food and Agricultural Science*	1786	550	31
Agricultural Economics	133	52	39
Agricultural Engineering	74	38	51
Agronomy	369	128	55
Animal Sciences	100	34	34
Forestry	76	20	26

\* Total also includes other disciplines not listed.

Source: [8].

foreign assistance, show particularly high foreign student participation at the doctoral level.

In 1987/88, an estimated 44 percent of the 356,190 foreign students studying in the U.S. were in graduate studies. Of the 7,930 in agricultural sciences, 72 percent were graduate students, the highest proportion in any field.

However, agriculture is one of the least popular fields among foreign students. Preferred disciplines and the percentage of foreign students who chose these fields include engineering (22%), business and management (17%), mathematics and computer science (11%), physical and life sciences (9%) and social sciences (7%). The agricultural sciences had only 2.2 percent of the total foreign student enrollment in 1987/88. Given the declining trend noted above, the agricultural portion will likely shrink further.

## Training Quality and Relevance

Faculty sometimes feel that a graduate program heavily dependent on foreign student enrollment is less desirable than one with more balance between domestic and foreign students. Reasons given include the suggestion that program quality may suffer; state support may decline if research and training are seen to serve mainly outsiders; research foci will change because of different interests; participation in sensitive or classified research may be reduced; and enrollment

can be uncertain due to political and economic gyrations abroad.

Barber and Morgan [2] studied the consequences of high proportions of foreign students within engineering graduate programs. Quality apparently did not suffer. They concluded that foreign student enrollment was generally a boon rather than a bane. However, they also stated "that differences in language, differences in styles of research, and differences in primary national allegiance can become burdensome when the proportion of foreign graduate students in engineering education is very high. The advantages of a foreign component in the student body may well be undermined when the proportion of foreign students is one half or more" [2, p. 36].

Training relevancy is a common concern not only for foreign students [10, 11, 17] but for domestic students as well [6, 15, 18]. For both groups, writers are advocating major curricula changes, including more internationalization of programs, more national and international research and training linkages, and increased emphasis on global education so that today's graduates can operate effectively in the future. Utrecht and Nobe [23] found that foreign participants wanted more training in research methodologies, planning, project evaluation, and public administration/management. Schuh adds that many universities have moved backwards in terms of their capacity to operate in a rapidly complex and changing world. He further states that "we have let our own in-house capacity decline so much that it will take a major commitment of resources and time to rebuild our capacity" [20, p. 102]. Obviously, a major challenge lies ahead to maintain or enhance the relevancy of curricula offerings.

## Other Training Issues

### Recurrent Themes

Several international training/education issues have changed little over many years. Bonner [3] noted the "recurring nature of so many of the themes we are discussing and debating", finding that today's issues were present in "10-15-20 year old papers" that he had discovered in the file cabinet when he moved into a new office. Further evidence comes from reviewing priorities set in a 1979 conference on international education (16). That conference stressed the need to:

- a. Emphasize the importance of agriculture in development,
- b. Train students in administration and management of agricultural systems,
- c. Provide many types of training, including short-term practical training, degree and non-degree opportunities,
- d. Train across disciplines,
- e. Stress analytical thinking and problem solving,
- f. Recruit more women,
- g. Be flexible in designing programs to meet specific student or country needs,
- h. Build collaboration between U.S. and developing nation schools,
- i. Find ways to maintain linkages after students return home,
- j. Have students do research in their own countries, and
- k. Generate funding to permit more faculty and student exchange among countries.

Most of these same issues are topical today. We need to assess why this is so and move to resolve those that remain realistic expectations. If they have been on the agenda for a decade or longer without resolution, are they truly feasible?

## New Issues

**Costs:** Other problems are surfacing as well. Among them, the cost of higher education is becoming a concern to many funding agencies. Prosterman and Hanstad [19] estimate that each student costs \$20,300 per year, the average cost per degree being \$63,000. Sponsors are also concerned with rising costs for short-term, non-degree training. Training suppliers are increasingly being asked to export training programs to developing countries or regional centers because of cost factors.

**Elitism:** Several factors combine to produce the allegation that "American colleges and universities are evidently increasingly educating the children of the upper classes of other countries" [22, p. 90]. First, high costs discriminate in favor of the affluent in the case of self financed studies. Second, host country governmental influence or control over allocation of training opportunities often works in favor of politically entrenched elites. Third, rigorous adherence to admissions standards can limit entry to foreign students who, through affluence or influence, were able to bypass indigenous, local language school systems. These observations may, and probably should, generate pressures to redistribute foreign assistance training toward non-elite participants.

## The Future?

### Uncertainty

Forecasting the future is always risky, and no less so for international training in land-grant universities. Consider China. Approximately 40,000 Chinese are currently studying in the U.S., the largest such contingent. Recent political upheavals, however, suggest that the number may be volatile. Turmoil in other Asian countries that are major suppliers of students like India, Pakistan, and South Korea could have similar effects.

### Collaboration

Several changes in the nature of U.S. economic cooperation with developing countries have been recently recommended, partly in search of an agenda for the 1990s. A common theme has been the need for collaborative approaches to economic cooperation, technical assistance, and training. Many countries have increased their managerial, technical, and scientific capabilities. New, relatively effective development-oriented institutions are emerging in the developing world. "The existence of this core of trained and skilled personnel necessitates new norms of equality between donors and recipients and opens up a range of potential relationships based upon more direct mutual benefit..." [21, p. 5]. In addition, common problems call for a united effort. Global environmental issues and global debt further emphasize the need for new collaborative strategies. Even within a collaborative environment, the U.S. is felt to have a comparative advantage in scientific research and training.

Fewer sympathetic views of an American education for foreign nationals can also be heard. Some suggest that the comparative advantage of U.S. universities may be declining, specifically, as U.S. agricultural technologies continue to outstrip those of the developing countries [9]. A grade of "F" was given to an important USAID financed African graduate fellowship program because "the extremely high cost of training, coupled with the very real possibility that

AID is here simply training many of these people for U.S. or third-country jobs ...” [19, p. 39]. Hansen [7] feels that the existing mode of one U.S. university providing technical assistance to one third world university is outdated and must be modified to provide a more interactive, collegial relationship. Andrew [1] argues for a complete rethinking of USAID Title XII relationships followed by a refocus from process to substance in long-term, regional and country development strategies. He has proposed the formation of a pool of U.S. universities working with a given country or region over a longer term. This would encourage commitments to language training by faculty and the development of collaborative research and training with host country institutions.

Reports of the Task Force on Foreign Assistance [9] and of the Phoenix Group [12] have also supported the collaborative mode of operation for international technical assistance, research, and training. Future foreign assistance legislation will likely reflect this thinking.

### Training and USAID

Proposed foreign assistance legislation continues to emphasize training at U.S. universities. The House Task Force report states that “U.S. institutional and technical resources are highly relevant to current development issues...[and] The research capabilities and developmental and technical expertise of U.S. universities are valuable resources that need to be utilized to deal effectively with today’s development issues” [9, pp. 25 and 28]. The report further recognizes that U.S. colleges and universities are still first choice among many foreign students seeking advanced education in science, medicine, and management.

The Phoenix Group also acknowledges U.S. leadership in education and training. They conclude that “improved training and education is one of the best ways to obtain the most out of the U.S. development dollar.” They warn, however, that some of past training has been ineffective for the developing world. To be more effective three recommendations are offered:

- Package programs specifically applied to situations trainees will face in their own countries.
- Prepare information and management packages reflecting local definitions of problems to be addressed.
- Place higher priority on programs of reform and modernization to improve the general environment for sustainable development [12, pp. 22-23].

Implicit in these recommendations is an expanded need for faculty and researchers with extensive experience in studying and solving development problems in the developing nations.

The Smuckler report also states that “advanced training is a key to practically every aspect of development... the U.S. has a great deal to gain from innovation and mature cooperation in higher education and should find ways to encourage it” [21, p. 22]. This report, as do the others, stresses the need to work collegially with a core of well-trained scientists and educators in developing countries.

This collaborative effort among institutions of higher education in the U.S. and the developing countries is especially important given recent evidence of stagnation in educational institutions in developing countries [7]. USAID

has been the primary donor in establishing or strengthening agricultural universities and colleges in many countries. Renewed cooperative research and training relationships between U.S. and the developing world’s educational institutions could be an important step in rejuvenating their programs.

A few experiments with collaborative training programs exist. The University of Minnesota has a joint Ph.D. and Masters program with the Hussain II Institute of Agriculture and Veterinary Medicine in Morocco. Colorado State University has just graduated the first class under a joint program offering a Master of Agricultural Systems degree at the Autonomous University of Guadalajara, Mexico. Undoubtedly, other institutions are considering or implementing similar programs.

We are now said to be in the information age, which also has significant implications for the future of higher education and the way in which we carry out research and training. Common data bases shared by many universities, nationally and internationally, are almost upon us. College degrees can now be earned entirely through televised curricula. Satellite teleconferencing and other rapid electronic forums to discuss research problems and results appear more feasible and cost-effective each day [Langenberg]. Rapidly evolving communication and information technologies may soon allow us to teach global education concepts to on-campus students while practicing it abroad daily.

### Implications

What can be distilled from this collection of data, opinions and observations? In summary, the following implications for land-grant institutions can be drawn.

- ① Dissipating enrollment in agricultural sciences suggests that several universities may face critical mass problems in sustaining graduate programs, especially doctoral programs. Historically, foreign students have helped to sustain many such programs at vital levels. However, the future of foreign demand for graduate education in agricultural sciences is not buoyant. Increased competition for a shrinking student population can be expected. Inevitably some institutions will face pressures to lower admission standards where a valued graduate program is in jeopardy. We note, however, that there are other ways to compete that do not risk program quality.
- ② Both cost and curriculum relevance will continue to fuel pressures for exporting the training/education function. The future will call for imagination and breaking of old molds by the land-grant community. Various forms of collaborative, institution-to-institution training programs will be explored. Overseas delivery of many of the present short courses, non-degree options, and portions of degree programs will likely see growing frequency.
- ③ Training non-elites will raise special problems. In general these participants will be less well prepared conceptually, in language, and in prerequisite academic skills for the U.S. college experience. If non-elites become a major component of participant training, new and innovative remedial programs will be needed. If this emphasis becomes significant, the numbers involved may dictate

overseas delivery of these programs. Collaborative, institution to institution arrangements can facilitate this.

④ Present trends in desired academic majors suggest that the balance may be shifting away from those disciplines usually associated with land-grant schools. Engineering, business, management, computers and life sciences are taught well in private schools and public institutions outside the land-grant system. Over time the land-grant share of the participant training dollar can be expected to shrink unless this issue is recognized. Aggressive recruiting may be needed.

⑤ Growing dichotomies between technologies in use abroad and in the U.S. suggest that the appropriate international teacher and program of the future may be characterized more by today's vocational agriculture programs than by university curricula at major research universities. New actors on the supply side might be expected, such as smaller schools in state systems. Meeting future training needs may bring to bear whole university systems in which both large and small members contribute from their areas of strength.

In summary, perhaps the main certainty is the uncertain nature of the future itself. Actors, programs, contract modes and participants are in a state of flux. The land-grant community will be called on to innovate, to be flexible and to be needs oriented. There will likely be some programs that fall by the wayside. There is, however, every reason to feel that quality programs, designed and administered with imagination and sensitivity will survive and possibly flourish.

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# BOOK REVIEWS

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Burley, R.W. and D.V. Vadehra. *The Avian Egg-Chemistry and Biology*. John Wiley and Sons, Inc. New York. 1989. 472 pp. Hardbound, \$85.00.

These authors endeavored to survey the chemistry and structure of the egg as related to biosynthesis and biological functions of eggs. They also included aspects related to processing, human uses and nutritional properties of eggs. As discussed in the preface, the authors used as their model the classic book of Romanoff and Romanoff, *The Avian Egg* (1949). A new book providing an updated approach to egg chemistry has been needed. This is especially true since Stadelman and Cotterill's book (*Egg Science and Technology*) has been recently out-of-print. Although this book does not have the detail and depth of the original *Avian Egg*, the book is excellent.

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