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FINAL REPORT

A STUDY OF RESEARCH PRIORITIES IN THE FIELD OF INTERNATIONAL TRAINING

Under Contract No. AID/SOD/PDC-C-0394
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PREFACE

This study was prepared by Development Associates, Inc., under contract #AID/SOD/PDC-C-0394, Work Order No. 17.

The principal purpose of the study was to identify research priorities for the Office of International Training through a number of activities including a literature review, extensive interviews with professionals from the international training community, a mail survey and a workshop which was conducted at the National Academy of Sciences.

Particular mention is due to the participants of the workshop who represented a diversity and depth of experience which would be difficult to duplicate in any one setting. Their extensive and profound contributions to the field of international training provided an intellectual perspective which lent a quality of universality and totality to the workshop proceedings. Grateful acknowledgement is extended to all of the participants who shared their insights and helped shape the research agenda.

It should be noted that the Research Agenda for the Office of International Training (Chapter 4) was developed as a result of all the study efforts including the workshop which supported findings and conclusions drawn from interviews, the literature search and the mail survey. While the workshop was the major thrust of the study in terms of recommendations on research priorities, other research areas were identified from other sources.

Development Associates wishes to extend appreciation to Dr. Raga S. Elim, the AID project officer, whose insightful guidance facilitated the study efforts, Ms. Dona Wolf, Director of S&T/IT who initiated and supported the study and, other members of the Advisory Committee who contributed invaluable assistance and suggestions: John Daly (Office of the Science Advisor), Floyd O'Quinn, (S&T/RUR), Frank Method, (PPC/PDPR) and Norman Nicholson (S&T/HR).

Finally, appreciation is owed to Tania Romashko, Loretta Johnston and Ruth O'Brien of Development Associates' staff who contributed to the study and workshop proceedings.

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EXECUTIVE SUMMARY

This study was completed for the Office of International Training, Bureau for Science and Technology, (S&T/IT), Agency for International Development, under contract AID/SOD/PDC-C-0394, Work Order No. 17.

The objective of the study was to arrive at a set of research priorities in the field of international training by a review of literature and relevant documents, interviews with AID and non-AID personnel, a mail survey of selected organizations and a workshop on research priorities for S&T/IT.

The workshop was attended by representatives from the international education and training community which included many major organizations and institutions concerned with developing countries and the problems of training and education.

GENERAL FINDINGS

- The results of this study indicated that International Training is one of the most important components in meeting the Human Resources needs of third world countries and that unless some of the major problems in training foreign nationals are resolved, developing countries will face serious and regressive problems in achieving some degree of self-sufficiency in science and technology, thereby affecting the socio-economic conditions in adverse ways, creating problems for both the developing and developed countries.

  Research in several important areas were considered and recommended in order to improve the role of international training in development and to develop a statement of research priorities for AID. These recommendations covered such areas as (1) analysis of third country and regional training institutions, (2) analysis of alternative training modes, (3) role of the private sector and the military in training innovations and resources, (4) role of women in training and development, (5) results of brain drain and alternative training designs, (6) studies on cultural perceptions affecting the transfer of science and technology, (7) training technology as it relates to third world countries, and (8) building science and technology

infrastructure in developing countries. Many other research topics were identified in terms of costs/benefits and training to improve project implementation (i.e., management/administration) but the problems associated with the lack of a basic science and technology foundation in developing countries was considered by the workgroup participants as one of the most serious concerns in the development process.

- It was also evident that a great deal of valuable interchange of ideas, techniques, and approaches to problems was provided through the workgroup and that participants felt some kind of network should be established where the international training community could continue to pursue and exchange ideas on the training experience for development.

RECOMMENDATIONS

The results of the study and particularly the workshop activities should provide AID with a wealth of ideas and opportunities to improve the Agency's training programs and contribute to international training and development in general. Specifically, AID should establish an interagency committee on training with high priority for integrating the training process to development objectives in a meaningful way. In addition, an international network should be established for conducting a dialogue on training issues and problems, exchange of ideas, collaboration on research and studies, and dissemination of information.

Both the interagency committee and the international network should be under the direction of the Office of International Training in the Bureau for Science and Technology.

Research Agenda

The following research agenda was developed with specific recommendations to conduct an immediate study on the output of training in order to determine who has been trained, what former participants are doing and where they are located. This is seen as necessary in order to ascertain the relative effectiveness of training with regard to project goals and objectives.

There is generally universal agreement on the lack of clear, unambiguous information on what happens to participants after training. Without such information, it is difficult to either pursue established policy with cogency or to develop a logically coherent one. This should be a first priority in research. Other research priorities recommended for S&T/IT, but with no particular hierarchy of importance or ordered sequence are the following:

1. Role of Women in Development

   Topic/Approach

   The role of women in development is one of the most important questions in terms of costs and benefits of training and the likelihood of increasing the labor force in developing countries. A study should be conducted which examines the role of women in economic and social development, and the types of training which has been done contrasted to potentially new fields of career professionals. The study should analyze the relative tradeoffs in training of women, likelihood of employment, differential earnings, longer term investment, and the social consequences of increased labor force participation at administrative and managerial levels.

   The study methodology should focus on Asian, African and Latin American countries, but with particular emphasis on societies which have long histories of traditional divisions of male/female labor. Sample sites would include both urban and rural women in development. This study should be undertaken within the next two years.

2. Utilization of the Private Sector in Training

   Topic/Approach

   The private sector has made significant contributions to training in developing countries and, therefore, research should be done on how the donor countries, AID, and other organizations can effect cooperative linkages and relationships with the private sector, but particularly in the field of technology transfer. A study is needed to examine what specific contributions the technology of the private sector can make to improving technology training and reinforcing the technological infrastructure of developing countries.

3. Use of Regional and Third Country Training Institutions

   Topic/Approach

   A critical feature of the development process is the lack of indigenous training institutions and the resulting potential brain drain when students study abroad. A research study is imperative to assess national and regional training institutions in developing countries with regard to U.S. training and educational institutions. The study should look at existing institutions and examine their relative success or failure.

Such variables should be examined as numbers of courses and levels offered, curriculum, language of instruction, faculty, institutional credentials, resources for research and contributions to national, regional, or international problems in development. Of particular importance would be to sample existing institutions of developing countries in comparison to the level of education and training which is provided at U.S. institutions. An analysis of present and future capability, resources needed for self-sufficiency, and credentialing in particular areas, would also be examined.

4. Alternative Training Methodologies

Topic/Approach

A study on the alternative methodologies of training and its cost effectiveness represents a subject of importance to AID and other donor agencies. For example, research relating to when participants should be sent to overseas institutions for training (i.e., mid-career, junior management level) can provide a different dimension to AID training policy. A mid-career scientist or technician might benefit more from training at a U.S. institution on a short-term or intermediate basis than compared to a participant who is just entering the job market after a protracted study period in the United States. A research project to examine the cost effectiveness of alternative training modes could have significant implications for AID and the developing countries.

5. Analysis of Followup Career Assistance and Information Dissemination

Topic/Approach

Once participants return home from training and education in the United States, there is virtually no further contact between the former student/trainer and AID, training institutions or contractors, professionals in the field and professional organizations. This is one of the factors which account for "Technology Loss" when there is no mechanism for keeping the professional informed on scientific and technical advancements and achievements. This situation also affects the development process and may specifically have an impact on the success of AID developmental projects for which training and education were provided. A yield on the training investment is therefore lost when no followup assistance and/or followup information is provided. A study on followup would sample a number of past and recently returned participants to examine how science and technology was used, what jobs and career ladders have been established, what issues and problems can be identified regarding state of the art, and what mechanisms can be established for effective followup career assistance and information dissemination on science and technology.

6. Study of Management Technology and its Applicability and Relevance to Developing Countries

Topic/Approach

The improvement of management and its application to third world environments continues to be a concern of AID and other international training institutions and organizations.

A research study on how management technology is affected by cultural, social, political, and economic conditions is one which directly relates to AID's success with development projects. The study should comparatively examine the socio-cultural contexts in which management plays a role and determine what management skills and knowledge are relevant for developing countries. The research should also identify how different cultures accommodate or adapt management technology, and whether different socio-cultural conditions determine management utilization of skills and what is relevant to local needs. A cross-cultural study which looks at different levels of development and organization, economic, and social resources as well as cultural attributes should be designed with a view to adapting more effective training methods for developing countries.

7. Study on Innovations in Training

Topic/Approach

A study on innovative training approaches that have been developed by private industry and/or the military can provide some fresh insight to AID's participant training program as well as other international training programs. The private sector and the military have often been very effective and innovative when dealing with civilian education and training in developing countries.

A study, particularly in short term technical skills, could reveal some very cost effective and innovative approaches to training in nonformal and technical environments. This study could be a relatively quick survey research type which selectively samples a number of private sector and military training programs in selected areas and countries. An analysis of training methodologies and innovations would then form the basis for further research, if warranted.

8. Research on Participant Selection Criteria

Topic/Approach

The principal obstacle to the success of most training programs and development projects funded by AID and other donor agencies is the qualities and skills of the persons being trained. The selection of trainees (participants) is an important part of the training effort. Factors such as relative age, background, and fields of study in addition to other characteristics are crucial in terms of training success.

Also, how close is the correlation between developing country needs, projects, and student objectives? A research study on the differential success by selection criteria variables could provide some critical information on the characteristics of persons being trained and their relative success in the country's development and/or professional jobs for which they were trained.

Questions such as "Are we training the right persons?" or "What are the predictors of successful training for participants?" might be useful outputs of this study. It may also provide missions with guidelines in

working with host country officials in selection of the participant and, parenthetically, in setting criteria for aggressive recruitment of participants.

9. Analysis of the Impact on Development From International Training

Topic/Approach

This study would attempt to identify the key variables in terms of training impact on the development process.

A series of case studies on countries which have made significant progress in science and technology and cross-national studies of science and technology indicators would provide some benchmarks on success criteria. The impact on training as it relates to other development processes such as national policy and strong commitment to development would also be examined as well as other government policies on trade, taxes, the private sector, etc. The extent to which this could provide a basis for looking at training as part of a larger development process may indicate training for upper level bureaucrats, scientists, and other technical fields. Training could be part of a national development plan on human resources (i.e., Human Resource Planning Boards and the relationship to training programs). This study would sample both successful and relatively unsuccessful efforts at institutionalizing science and technology in agriculture, energy, health, nutrition, and could provide crucial information on the role and degree of training in development.

10. Study of Costs and Benefits of Training in Different Fields

Topic/Approach

An economic study should be conducted on the relative costs and benefits of participants trained in a select number of scientific, technical and professional disciplines. Such a study would provide AID with key information on the costs of training to AID and the host country (including the participant) and the relative benefits both personal and institutional as they relate to the development process and AID's training goals and objectives.

The potential outcome of this study would be to compare training in a sample of professional and technical fields (i.e., agriculture, bio-technology, engineering) in order to determine relatively whether costs and benefits justify training and to provide basic information for decisions on which areas AID yields a better return vis-a-vis development goals.

Moreover, such a study could document the relative costs and benefits of particular countries in terms of their relationship to socio-economic development in general and AID training and development projects in particular.

The above research topics should be considered as key factors for improving the agency's training program but also to provide a sharper perspective of how training relates to development and overall policy and program decisions.

Hopefully, the workshop results and recommendations can be useful to AID's training efforts and shared with the international training community for third world development.

CHAPTER 1. BACKGROUND

This study was conducted for the Office of International Training, Bureau for Science and Technology (S&T/IT), Agency for International Development. The principal purpose was to identify research priorities for S&T/IT in the field of international training and to make recommendations concerning how AID's training programs can be improved. However, the field of study covered international training in general but with a specific focus on issues confronting AID's development process as it relates to international training. Therefore, the issues (and problems) embraced a general understanding of how international training contributes to developing countries' needs and other donor country and agency strategies. This provided a broader dimension of international training which helped to clarify AID's perspective with regard to policy, goals, objectives, and resources necessary to pursue them.

For example, not only were AID's training programs and research needs examined but those of other organizations, agencies and donor countries. Specifically, the World Bank, National Academy of Sciences, National Science Foundation and other private and public training institutions all contributed to the study findings.

The task of examining the nature of international training in its entirety constitutes a basis for clearly distinguishing AID's role in terms of overall Agency policy and its more limited programs in international training. On the other hand, non-AID organizations hopefully benefitted from the opportunity to compare approaches and share training experiences which may contribute to improved programs and policy in training and education for development.

A. Study Methodology

The study methodology involved a review of research currently being carried out by the international training community, conducting interviews with AID officials and representatives from other organizations and institutions which are concerned with international training, a mail survey, and finally a workshop on research projects. While there are a number of studies conducted

on the development process, very little of what may properly be called research is in the field of international training, although some research and studies have been periodically carried out by such organizations as the National Association for Foreign Student Affairs (NAFSA), World Bank, National Science Foundation (NSF), the American Association of Collegiate Registrars and Admissions Officers (AACRAO) and others. It should also be noted that a portion of the existing research is on foreign students or international education per se. Thus, the findings and conclusions are not always relevant to the issues in which AID is particularly concerned.

A number of research issues were identified during the course of the interviews. In particular, four critical issues of international training related to developing country needs and human resource development were emphasized. These are:

1. The appropriateness of science and technical training.
2. The transfer of management technology.
3. Institutionalization of training capability in developing countries.
4. Costs and benefits of international training.

The four broad topics described above subsume a number of subtopical research and study areas which are to be defined as a function of the unique policy and program goals of developing countries, donor agencies, and available resources. Moreover, the degree to which each of the topical research areas are relevant to the development process is governed by the characteristics and conditions of particular developing countries, involving the social, economic, environmental, cultural and political considerations. By and large, however, the four research areas were identified through a consensus of opinion, a restricted mail survey, as well as personal interviews and were viewed as the principal, overriding issues with regard to human resources development and needs of developing countries. (See Section III, Workshop Findings.)

CHAPTER 2. MAIL SURVEY

A select number of organizations and institutions were identified as subjects of the mail survey. (See the mailing list and the questionnaire in Appendices A and B, respectively.) The questionnaire was designed to obtain information on research priorities in international training. In addition, information was requested on past research or current research being done in the field. Approximately thirty (30) questionnaires were mailed to a list of organizations of which 18 responded (60%). Among the questionnaire items was a series of possible research questions which respondents were asked to rate as very important, important or not very important to improve international training programs for developing countries.

The question which received the clearest response value as being very important for research priority was the one dealing with the institutionalization of training capability. The question was:

> "(o) How important is the development of institutional training capability in developing countries and what are the problems? (i.e., hardware, capital, etc.)"

Fifteen of eighteen respondents (83%) felt that this question was very important for research consideration and it is consistent with views expressed through interviews and from the literature review. Clearly, the topic of institutionalizing training capability in devloping countries and research on the problems associated with this are main concerns throughout the international training and development community.

The topic for research which most persons considered as not very important was the question on the length of training and the intervening gap between project design and completion of training. The question was:

"(h) How long does it usually take between the time when training programs are designed and when the first trainees complete training?"

Fourteen respondents (78%) thought that this topic was not very important while four thought it was important (3) or very important (1). This is somewhat surprising since the duration of training and increased costs when training is prolonged is a key concern of Missions and other donors who must, in several cases, extend the time for the participant to complete training. This question may have received a different value had Missions been included in the mail survey, but their schedule and workload precluded a field survey of this kind.

One other quesion was split approximately 33% as being very important, important or not very important and was concerned with the subject of training technologies which are particularly effective with trainees or students. The question was:

"(k) Are there training technologies or techniques (e.g., programmed instruction or use of computers) which are particularly effective with trainees from specific countries or regions?"

The even split as to levels of importance to research may mask a more underlying critical concern which is the appropriateness of training in various disciplines or subjects such as management training. The manner in which training is conducted in the U.S. or other countries has been a topic of concern and debate for several decades and the ability to match training and education to the appropriate conditions for utilization and transfer in the student's home environment is a complex question.

For example, how different cultures perceive science and technology within the social and cultural milieu and the relative value it is afforded in contrast to, say, human values or religious ones can profoundly affect the use of science and technology in the development process. If there is an innate conflict or tension with some cultures to modern technology, then the training techniques, the kinds

of training, and the location of training may indeed be critical considerations for some developing countries. The question as stated does not imply these other socio-cultural dimensions to effective training, but nevertheless these are serious considerations when advanced technologies or computerized instruction are proposed to improve training.

Among the remaining questions, there were two which were accorded a relatively high value of importance to research. The first one focused on assessing human resource needs:

> "(a) How should manpower needs assessments be designed to accurately identify training needs in developing countries?"

Fifteen respondents (83%) indicated that this question was very important or important. A recurring concern which emerged during the interviews and literature review was that effective training is to a great part and in many instances determined by the level of human resource planning.

The focus on manpower planning has been emphasized strongly (T.L. Maliyamkono, 1980) in much of the recent studies on East Africa.* It is generally recognized that progress and development depend first on a concrete grasp of manpower needs on which effective training and education can be provided and, if utilized properly, will contribute to growth and self-reliance. However, a basic problem which most developing countries face is that such data and information on human resource needs is non-existent and, further, that in too many cases there is no bureaucratic infrastructure exhibiting a policy or an organizational capability to carry out planning for human resource development.

All of these factors, of course, have a direct relationship to international training and development in general and to AID's participant training program in particular. Certainly before donor countries and agencies can begin to design a

*Policy Developments in Overseas Training. T.L. Maliyamkono, Eastern African Universities Research Project, 1980. Black Star Agencies, P.O. Box 3978, Dar es Salaam, Tanzania.

coherent strategy which integrates the development process with effective training, there must be reliable data and information on basic characteristics of the population and the human resource needs within the context of development and national project needs as well as those of donor countries.

The second question of which there was major consensus on its importance to research on international training was the following:

> "(n) What are the problems and constraints in the effective transfer of technology to developing countries?"

The question on the effective transfer of technology to developing countries has also been debated for decades and is one which seems to persist in the international community. The approach to international training has undergone a series of cycles over the years, but with advanced technology and the growth of basic infrastructure in developing countries, some changes have occurred in both the approach and the design of training. However, the issue of appropriate transfer of technology as yet presents serious difficulties and challenges. Many of the root problems can be traced to the same cultural origins which influence the perception of science and technology to the development process and social progress. There are other more basic issues, though, which transcend the socio-cultural ethos and are fundamentally grounded on economic problems. The woeful lack of equipment and science infrastructurre has effectively rendered some high technology training for developing countries as little more than useless.

The role of the private sector and U.S. industry has not been explored as to mutual U.S. and foreign benefits derived from the use of U.S. technical equipment (i.e., labs, glassblowers, computers) to build up research capability. The entire issue of basic laboratory and research equipment along with the inability to "keep up" with science and technology in the absence of <u>information transfer</u> (ie., lack of professional journals, modern textbooks, publishing of conferences, language barrier, etc.) is a problem of considerable magnitude.

These factors are compounded by the more subtle aspects of peer relationship to participants trained in sophisticated techniques in U.S. institutions compared to more modest training of domestic colleagues. The absence of a research climate and the alien environment to research methods has caused many observers to question the levels of science and technology training.

Finally, the issue of Brain Drain and the loss of human resources to developing countries is another equation which fits into the process of technology transfer. The question of who should be trained and when in which location are important issues in retaining indigenous talent and avoiding the loss of potentially key scientists, scholars and technicians. This topic is also directly related to the one which focuses on institutionalization of training capability in developing countries as well as the use of third country training which many European donor countries and the United Kingdom have adopted as policy with regard to training and education of developing country participants.

The other key topics which questionnaire respondents agreed as important to research were oriented more towards the process of training. The following questions were considered as important or very important for research.

> "(e) What are the costs and benefits of providing English language training at various sites (home country, regional centers, overseas, special English language centers, U.S. training institutions)?"

The ability of foreign students to adequately handle the English language for college level work has been a continuing problem for AID as well as other donor agencies. The procedures initiated to prepare and test foreign students has seldom worked very well and, in the case of AID's participant trainees, many arrive here with low TOEFL scores and inadequate command of English to pursue colleges courses. The result is more time and money than originally planned for the participant's training program. This topic has been especially important

to the practitioners,* i.e., trainers, training institutions, centers for English language training and AID's programming agents and contractors.

> "(g) What procedures are most effective in assuring that training content matches training needs?"

This topic is another key operational aspect of the education and training programs. Some of the more common problems which have been discussed by professional observers and trainers is the lack of well defined objectives for the participant and inadequate information on the nature of the problems in developing countries.

While some training institutions have overseas experience in the developing countries, many others do not and training courses are seldom, if ever, modified to suit the needs of foreign students. Indeed, many educators feel that tailoring courses to needs of foreign students is impractical (or extremely difficult) and would result in an inferior education. Nevertheless, it is obvious that some accommodation is desirable, if not necessary, in order for participants from developing countries to apply their education and training to the unique needs of the home country.

More hands-on training and education has been suggested as a way to avoid the irrelevancy of more theoretical studies, particularly in the fields of agriculture and health.

> "(j) What types of measures are most useful in assessing the effectiveness of training?"

*The American Language Institute, Georgetown University (ALIGU) is currently conducting research on some of these issues.

This topic is one of concern to the international training community at virtually all levels from program planning and development to the project operation level in developing countries. In one sense, the success of development efforts rely heavily on and can be determined by how effective training and education programs have been in meeting donor country goals and program development objectives.

Without information on the effectiveness of training, it is extremely difficult to logically plan strategies for development and to develop projects which are meeting needs. Further, if training is to be improved, it is crucial to provide some feedback to donor agencies and training institutions so they become aware of the issues or problems.

"(d) What are the costs and benefits of home country training, third country training and U.S. training?"

This topic relates closely to the one on institutionalization of training in question "o" but differs in that costs and benefits are management oriented and concerned with administrative machinery while institutionalization is a development concept and is concerned not so much with the present, but with the future in terms of the machinery of policy and program planning.

However, there are other basic considerations as to the location of training in terms of costs and benefits. For the United States and the Agency for International Development, there are decisions made on training which are integrated with and are highly correlated with some basic national considerations. To begin with, it must be recognized that the United States has a broad policy framework in its foreign policy relations and particularly in its dealings with third world or developing countries. The Agency for International Development, to a degree, reflects that policy in one specific aspect, which is to expose foreign nationals to the democratic process and the spirit of human and social endeavors which emanate from it in terms of problem solving and freedom of inquiry, equality and cooperation.

This "Policy" is certainly an inherent part of the operating mode of the participant training program where AID goals and objectives in developing countries are meshed with a more ideal and subtly expressed one of exposing the democratic process. This is amply demonstrated in the support AID gives to participant training in its orientation process, the midterm or winter seminars, and the support from the National Council of International Visitors (NCIV) whose goals are not only to accommodate the needs of foreign visitors, but to acquaint them with the American way of life.

Clearly, then, the training of foreign nationals in the United States has distinct advantages which transcend the questions of institutionalizing training capability in developing countries or of trying to make training more "relevant" by third country training. In this regard, it is worth noting that there are two bodies of opinion on this. One is that which has been expressed by AID officials and contends that if we are going to train foreign nationals for development objectives, then we must give them the best training available which is in the United States. The other body of opinion is that U.S. training, despite its technical superiority and infrastructure (i.e., equipment, materials and supporting organizations), is not that relevant to the needs of developing countries. Further, much of the high technology training cannot be effectively utilized when participants return home because: (1) there is an inadequate infrastructure which is necessary for science and technology to flourish, and (2) the academic, research and perhaps the organizational environment is not compatible or is hostile to the acquisition and adaptation of modern technology and new skills learned in U.S. (and other foreign) institutions. This opinion also has some adherents in AID.

Both sets of opinions are in great part based on perceptions of relevance, quality, utility and purpose. Each of these factors is given a different interpretation depending on the agency and donor country.

The use of third country training and home country training also has some inherent benefits and should not be easily dismissed. There exist some very sound reasons for this kind of training, but a number of factors must be considered.

The relative costs of international training has become an increasing concern worldwide to developed and developing countries alike. Since the cost of training is escalating, it is important to re-examine policies and benefits from U.S. training contrasted to overseas training. The available information on costs and benefits of different training systems and locations is limited. If costs become of increased concern, this topic may be very useful to policymakers and program planners.

> "(1) What training opportunities for international students are available from U.S. business and industries?"

The use of the private sector has been given recent emphasis by the Agency for International Development in terms of utilizing its experience and capability in the development process. Many U.S. firms have long been engaged in training of foreign nationals and have established facilities for specific types of technical training. However, the question of whether and how this training experience can be incorporated with U.S. and AID training programs remains unexplored for the most part.

Certainly, private industry represents a huge reservoir of talent, resources, and facilities for technical training. Moreover, in many cases the private sector has an effective organizational network spanning both domestic and overseas components. This training experience should be explored with regard to cooperative arrangements in the design and operation of specific technical training which may present a new tri-lateral relationship for devlopment between AID, the private sector and the developing country. Evidence seems to suggest that private industry has important contributions to the development process when there is a direct tie-in and link to U.S. development efforts and host country resources in education and training.

Summary

The mail survey, although limited, is represented by a considerable number of the most important, and largest organizations and institutions in the field of

international training. The sample was not random, but purposive in terms of the selected survey recipients. It is worth noting that all respondents are involved in some fashion with training and education and comprise a mix of professionals who have years of experience in these areas as well as in foreign student affairs.

There are, however, several caveats to the survey responses in terms of research priorities. The first is that many of the topics which polled a consensus of opinion as important are reflections of the respondents' perception of their own organizational and operational issues in international training. While this does not invalidate the survey, it is useful to know that the focus was necessarily on providers and not on those who are receivers, such as foreign students or host country officiels or, from AID's standpoint, U.S. Missions. The original survey design proposed to sample U.S. Missions, returned students, and host country representatives, but time constraints and Agency Mission priorities precluded this part of the study from the mail survey. The inclusion of this group may well have indicated other priorities, but it is not likely that there would be significant differences since the latter group of respondents would have received a different questionnaire than the one sent to U.S. organizations and institutions involved in international training, and many of the respondents in the mail survey were at one time receivers of training or former mission staff.

The second caveat is that some of the topics are focused on support of training or on ancillary activities in contrast to more substantive issues on the nature of training and the transfer of knowledge and skills to foreign students for development purposes. Many respondents were as concerned with these aspects of training research as with those of a more complex nature like appropriate technology.

Finally, the response to questions was generally consistent with and similar to concerns expressed through individual interviews, although the mail survey tended to provide a more specific direction to issues along with a relative value structure.

CHAPTER 3. WORKSHOP FINDINGS

The key feature of this study was the workshop which was held on the subject of research priorities in international training, at the National Academy of Sciences, January 31 and February 1, 1983. The workshop participants consisted of selected representatives from the U.S. Agency for International Development, the World Bank, other federal agencies, and organizations and institutions involved in international training. A list of invitees and participants appears in Appendix C. Many of those persons interviewed and who received the questionnaire were also workshop participants.

A. Format of the Workshop*

The workshop was structured according to the four key research areas mentioned earlier in the report. As indicated previously, the four areas were those most frequently mentioned during the interviews and through responses from the questionnaire. All participants were assigned to one of four work groups. However, before convening for individual work sessions, a keynote speech was delivered on the subject of "Training for Development With An International Perspective." This was followed by a panel discussion on "The Role of Training in International Development" with an emphasis on research issues, which concluded the morning session. The afternoon session began with a panel on the "Training Experience in Reference to the Lessions Learned and New Directions."

The mid-afternoon session broke up into four work groups:

- Work Group I - Appropriateness of Science and Technology Training
- Work Group II - The Transfer of Management Technology
- Work Group III - Institutionalization of Training Capabilities in LDCs
- Work Group IV - Economic Costs and Benefits of International Training

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*See Appendix D.

The groups convened for the remainder of the first day and met again the following morning. The specific purpose of the work groups was to examine the four topics with regard to issues and problems in the effectiveness of international training for the development process. The objective was to then establish specific areas of study and research for each topic in terms of priorities and interest to AID. On the afternoon of the second day, each work group was requested to provide in plenary session an oral report on their deliberations and conclusions. They were then asked to provide a brief narrative on establishing priorities for research and, to the extent possible, identify:

(1) Key Research Topics
(2) Strategy or Approach to Conducting Research
(3) Rationale/Criteria
(4) Resources Required

The reports from the work groups in terms of research priorities were delivered to the entire group of participants on the afternoon of the second day. A brief period was allowed for questions and answers after presentation.

The recommendations emanating from the workshop are provided in the following subsection. This is then followed by a specific research agenda for the Office of International Training in Chapter 4. The edited proceedings of the workshop are found in their entirety in Chapter 5.

B. Workshop Recommendations

Before proceeding to the specific research priorities established for each work group, it will be useful to briefly describe the cross-cutting factors which potentially influence the success of training and are considerations for establishing viable research in any of the four broad areas which were the subjects of the work groups. In many cases, discussions on some of the cross-cutting factors by necessity preceeded substantive examination of the work group topics in terms of resources, practicality, and infrastructure.

For example, cultural and social factors are important elements to consider in terms of technology transfer whether in the natural or social sciences. The extent to which science and technology transfer, including management and organizational structure, will encounter varying degrees of resistance (or rejection) depends greatly on the socio-cultural environment. Behavior and behavior change are integral components of the development process which research should address or take into account.

Another cross-cutting factor which will influence and determine the usefulness of research is the level of development and the resources of third world countries. Some research may be inappropriate if the lack of resources preclude any institutional change within the near future.

Finally, donor country and recipient country strategies for development, both in the political, scientific and social context, are fundamental considerations in policy and program development. The consequences of various project interventions can cause social dislocations which may have adverse results if the planning does not include elements of social anthropology, such as traditional roles in social and political organizations, male, female divisions of labor, etc. There are, of course, many other factors to consider, but it is useful in terms of international training and development to cite those which often are critical to the success of training and research.

C. Summary of Specific Key Recommendations

The recommendations of the work groups covered many issues and, in some cases, it was difficult to set specific priorities. Thus, the result was more or less a shopping list of topics, all of which were considered important but without any ordering process. The topics were thoroughly examined and represent variegated input. However, there were some recommendations which seemed to have relatively more urgency than others.

The basic topics of research will be listed for each group. A further treatment of research issues and additional topics for some groups is found in Chapter 5. Workshop Proceedings, Reports by Workgroup.

I. APPROPRIATENESS OF SCIENCE AND TECHNOLOGY TRAINING

The purpose of this work group was to consider research priorities for AID's Office of International Training (OIT), with special emphasis on the appropriateness of science and technology training. Participants in the work group included representatives of government agencies such as AID, NSF, and USIA; educational associations; universities; private and voluntary organizations; and consulting firms.

The leaders of the working group suggested two basic assumptions that might help focus on discussion. First, the specific functions of OIT limited the concerns of the panel. OIT will not do research on S&T training unrelated to its charter. Thus, while technological training in primary schools and trade schools will be very important in development, OIT will not conduct research on these processes. It may be assumed that OIT will be interested in professional training of so complex or specialized a kind that it is not available in the host country, yet of such economic importance that U.S. training may be justified. Examples of such training in the fields of science and technology might include: (1) senior research scientists, (2) university faculty, (3) agricultural, medical, and engineering specialists, (4) curriculum development personnel for S&T training activities of all kinds, and (5) agents for the transfer of specific techniques from the U.S. to the host country, etc. It is assumed that economics and the social sciences are included as well as the physical, life, and earth sciences, mathematics, and the applied sciences and technologies.

Second, research on international training may include descriptive studies and surveys, social science research, curriculum R&D, development of appropriate educational technology, and similar types of activities.

In addition, several topics were suggested as a guide to questions that the panel might wish to address in discussing research priorities. The topics and related questions were as follows:

- The Knowledge Base

  What is known about previous or ongoing research on S&T training for LDC nationals in the United States? What basic information needs to be known, such as numbers and courses of study of trainees, countries of origin, degrees sought, etc? What are the major sources of support for LDC trainees?

- Utilization

  What is known or needs to be known about the utilization of S&T training in the U.S.? Where do the trainees go after training and what do they do? How can research be used to improve the utilization of training?

- Strategies

  Given limited resources, what research can help the Office of International Training (OIT) improve strategies for selecting trainees, supporting them, and selecting training facilities? Questions to be addressed might include: should training resources be concentrated on the poorer LDCs? Should training resources be focused in particular areas of science and technology that seem to have special importance in the coming decade? Can national development plans provide a useful basis for outlining training strategies? What criteria should be used to select institutions to supply trainees, and how many trainees should be selected per institution?

- Needs of LDC Trainees

  Is good information available about the adaptation of LDC trainees to traditional university concerns and environments? Should research be done on development of special curricula or on mechanisms for emphasizing the application of S&T knowledge to developing country needs and situations? Is English training a special problem? What are the research priorities?

- Training Mechanisms

  What is known about the kinds of S&T training provided in the United States and their effectiveness? Does research need to be done, for example, on the effectiveness of short term, non-degree training vs. traditional university courses? Should experiments be done on ways to involve private industry in the training process?

- Educational Technology

  Are there cases in which modern educational and information technology can be used in innovative ways to increase the effectiveness of training or lower its costs? For example, what is the potential for machine-aided translation to assist foreign students in the U.S. in successfully carrying out their studies, in keeping up with technical literature upon return, and in serving as points of technology transfer to their home countries?

- Location of Training

  Where should training be provided -- home country, United States, other LDC? Should research be done on the value of followup of training? For example, would it be useful to experiment with ways of keeping trained scientists and engineers in touch with current developments in their field through short-term visits or seminars by U.S. academics or industrialists, or through better access to information?

The discussions of the work group participants led to several observations and conclusions that relate to research needs and priorities as well as to specific research issues that might be considered by the Office of International Training.

Observations and Conclusions

Members of the group emphasized the fact that although science and technology often are treated as a single entity, two different concepts are involved, and the related training consequently involves different considerations. Because science is universal, the location of training may be relatively unimportant. Training in technology, however, may very well involve the acquisition of specific techniques that can only be imparted in certain locations or under certain conditions.

The panel also emphasized the need to approach training for science and technology in a holistic manner. For example, access to certain kinds of important technology will be blocked unless a country possesses a base of science in related fields. Science and technology, moreover, cannot flourish without the support of fundamental technical services such as machine shops, instrument repair, and information services.

These issues led to the panel's stress on the importance of providing training where there will be an environment that allows the training to be used. Producing a well-trained scientist will not be very useful if that scientist returns to a situation in which important support services and facilities are lacking. In designing training for science and technology, therefore, consideration must be given to whether the means exist to provide the critical supporting environment.

Consideration should be given, the panel suggested, to the basic strategies underlying training in science and technology. Issues that might be considered could include the relationship of science and technology training to the personnel needs for critical sectors of national development plans. Training strategies might also consider the provision of personnel in frontier fields of science and technology so that developing countries will have access in coming years to the applications derived from important new areas of knowledge. The type of training provided for different countries might vary widely depending on the broad level of scientific and technical development; some countries may benefit greatly from training in a few rather specialized areas, while others may need to increase their base of personnel across a wide spectrum.

Experimentation with different approaches to science and technology training was recommended by the panel. For example, recognizing the need for good environments that allow training to be effective, "vertically integrated" training approaches might be used. Within a common project, technicians and support staff might be trained as well as research scientists. Intermittent schedules of training might be tried more frequently by giving intensive initial periods of training for several months, followed by a return to the workplace with subsequent followup training that would draw on the intervening work experience. There also seems to be a need to experiment with greater use of previous trainees in training roles or in the selection of new trainees.

Precursors to Research

The panel was united in agreeing that there is a great need to collect and analyze basic information about training programs and trainees, especially those of AID. There seems to be uneven information available on the numbers of people who have been trainees, the type of training provided, the subsequent utilization of the training, etc.

The need to collect previous research results relevant to the study of international training was also stressed. There is a significant but widely dispersed scientific literature on many of the key issues in the field, and this must be organized and used as a basis for future research.

Several participants stressed the potential for application of knowledge from the social studies of science to the study of international training in science and technology.

Criteria for Selection of Training Research Projects

In discussing ideas for specific research on international training related to science and technology, the work group considered a set of criteria as a basis for identifying useful projects. The criteria are posed in the following questions:

- What is the importance of a project as the basis for other research?
- What is the policy relevance to international training?
- What is the specific relevance to AID international training policy decisions?
- Will the project make a contribution to the understanding of fundamental training issues, such as describing the present status of international training with respect to stated objectives; clarifying the future objectives?
- Does the project fill a gap in current knowledge about international training?
- What is the practicality of the project in the context of available resources?
- What is the political sensitivity of the project?
- Will the outcome provide a basis for communication on policy and program issues?
- Does the project provide a potential for action research?
- Will the project lead to the development of improved training methods?

Suggested Research Topics

The work group identified the following training research areas, which were subsequently characterized within three broad categories: those pertaining to the science and technology development process, those dealing with specific training approaches or methodologies, and those that illuminate important cross-cultural training issues.

1. The Development Process

- Collection of basic information on existing and previous AID training programs in science and technology (review of project documents, statistics, surveys).
- Analysis of the developmental impact of international training. Approaches would include historical case studies of countries that have made significant progress in science and technology and cross-national studies of science and technology indicators.
- Analysis of the interplay between indigenous science and technology training and technology development and transfer in developing countries.
- Study of the process of development, diffusion, and training for appropriate technology in developing countries in order to identify more effective international training interventions (case studies).
- Examination of methodologies whereby AID can assess the utility of science and technology training to development and to the work of particular trainees.
- Summary of recent social studies research on education and training with special attention to innovative training approaches that may have been developed by private industry or the military.
- Analysis of the major expenses in providing science and technology infrastructure in developing countries, and the related expenditures on training of personnel. (Examine training costs by various fields of science and technology.)

2. Training Approaches or Methodologies

- Analysis of the value of followup career assistance to recent training participants (retrospective and prospective case studies).
- Studies on the differential success of trainees by selection criteria variables (surveys, followup studies).
- Study of the cost effectiveness of alternative training methodologies in contrast to traditional degree-awarding programs (alternative methodologies might include non-tradition curricula, private sector training programs, intermittent training schedules, etc.).
- Research and development on improving modern information and communications technologies for use in training.
- Studies on incentives to encourage private-sector donations of equipment and materials suitable for international training.

3. Cross-Cultural Issues

- Studies on the training impact of international training institutions established in developing countries (assessment of the impact of institutions such as the Asian Institute of Technology, the Indian Institute of Technology/Kanpur, etc., or comparison of training institutions supported by different donor countries.)
- Content analysis of developing-country literature to identify the perceptions of science in contrast to perceptions of technology.
- Evaluations of the adjustment by overseas participants to the training environment in this country including variables such as the location of training, the sending countries, and key selection criteria for trainees.

The work group agreed that the appropriateness of science and technology training was a critical question in terms of strategy for developing countries. The lack of basic information on who trainees are, what they do after returning home after being trained in the U.S., and where they are located are all key questions which need study and research as a basis for other inquiry and to explore linkages in the development process, as well as linkages to other AID sector research in such fields as agriculture and health.

II. THE TRANSFER OF MANAGEMENT TECHNOLOGY

The improvement of management continues to be a major contribution to development, and as stated previously, the transfer and application of management technology capability are dependent on cultural, social, political and economic conditions.

There are substantial opportunities for limited objective, short-term, adaptive research or "knowledge consolidation" projects that would provide results enabling AID to improve the payoff of its investments in training. Such projects should be given priority, not rejected because they appear to be small or do not fit academic or governmental standards for research.

Research Topics

The key feature to research in the transfer of management technology is information on the needs of developing countries. Therefore, the following

topics should be considered as the beginning of methods to transfer management technology.

1. Identify what management skills and knowledge are relevant and appropriate for developing countries.

   The expected benefits from this would be the ability to provide more effective management training in U.S. training institutions.

   Approach

   An action-oriented approach would focus on analysis and survey techniques with specific regard to barriers in the adaptation of modern management. Specifically, the approach would consider the following:

   - Extension and application of comparative management models/concepts.
   - Identify adaptations of management techniques in LDCs via follow-up of trained managers.
   - Identify conditions which aid and deter the transfer of management techniques to developing countries.
   - Adapt manager assessment tools (assessment centers).
   - Survey and analyses of management training to identify useful insights on what to include and how to transfer management techniques.

2. Identify specific training needs for those who will assume or currently fill a management role in science and technology.

   The benefits of this research would be to develop a profile of management training needs in science and technology which could impact on present implementation objectives.

   Approach

   The first step would be to analyze the selection criteria in order to ascertain the characteristics of participants. This would be followed by

an evaluation of the success of management training which would serve as the basis for guidance in developing management models and training urriculum.

3. Conduct a study on learning styles prevalent in developing countries with a view to adapting training methods and strategies to local needs.

The benefits of this research would be to provide training institutions with key information on how to adapt curriculum and methodology for more effective training which would impove the impact of AID programs.

Approach

A sample study of key participating countries in AID's participant training program should be undertaken in order to identify cross-national issues and problems in learning methodology and then using this as a base, examine potentially new teaching methodologies to meet learning needs.

III. THE INSTITUTIONALIZATION OF TRAINING CAPABILITIES IN DEVELOPING COUNTRIES

This topic covered a great deal of possible research which is listed in detail in the section on workshop proceedings. However, five basic areas of focus were identified in order to provide some key background data on the conditions, the implications, and the impact of training capabilities in developing countries.

The following research study was suggested as a basis for further consideration of policy.

1. Using existing resources, assess national and regional training institutions in developing countries with special regard to U.S.-financed institutions. Then, using a case-study and critical incident approach, do a qualitative assessment of the relative success or failure of the institution, the language of instruction, curricula, and other important factors which contribute to the institution's effectiveness. This information would be used by project designers, donors, receipients, technicians, and others.

2. This recommendation deals with on-the job training in small enterprises. An investigation would be useful in a few selected Asian, African, and Latin American countries of existing indigenous training processes and indigenous apprenticeships going on in the small enterprises, with a view to determine whether and how such enterprises might be helped to improve their performance without destroying their informal, non-bureaucratic character. (We note with approval that AID/ED has already initiated a limited investigation of this sort in two Latin American and one African country.) This research would be preceeded by a review of existing studies, actions, and programs in this area.

3. A tracer study is needed to determine the factors which contribute to the successful completion of AID participant training programs.

4. Young men and women who receive education and degrees in the U.S. often return to professional or technical positions in their own countries. In those positions, they have few opportunities to maintain their level of expertise. In 3-5 years they are likely to have fallen significantly behind their own field to the detriment of their performance. Is this statement true? If so, can some action program by AID help to ameliorate the problem? A study is needed to verify the assumptions on need for re-training and followup.

5. A quick inquiry would be helpful to look at innovative training methods used by the military forces in less developed countries (supported by the U.S. military), especially with respect to types of training that have important uses in the civilian sectors of society. (Note: In the past, military trainers have been far more industrious in learning from innovations in civilian education and training than vice versa.)

IV. COSTS AND BENEFITS OF INTERNATIONAL TRAINING

The principal outcome of this workgroup focused on the need to establish cost effectiveness of training programs. The suggested topics included the following:

1. A study to determine the cost effectiveness of training by looking at social return rates to country and to participant or job area.

2. A country specific study which examines: (a) costs, (b) earnings differential, (c) field of study and occupation, (d) time, and (e) other externalities. This research would compare training outside of country and home country training. The analysis would seek to determine highest social profitability.

3. A study to determine at what point in a career should training be provided and whether it should be in modular form rather than sequential. It may be more cost/beneficial to expend funds for short-term modules avoiding longer term sequential training. This raises questions of:

   - Transferability of specialized training;
   - Type of core curriculum as part of specialized training;
   - Criteria for selection -- generalists or specialists; and
   - Comprehensive training to broaden benefits, i.e., data processing should be accompanied by programming skills.

4. A study to determine the role of women in development. The challenges to traditional male/female roles in developing countries is one which is increasing and poses a number of questions on development and its impact on the social structure. The role of women in development is directly related to training and the effect on the labor force, professional and bureaucratic jobs and dislocations in the socio-cultural structure.

5. A study to compare the sponsored student participant with that of the self-financed student who returns home to find employment. What kinds of differences exist between fields of study, occupations, career ladders, income, aspirations and kinds of training programs?

The above research recommendations grew out of the work group sessions and represent, generally, a consensus on those questions and issues which require clarification before additional research with respect to policy and program change can be implemented. The discussions and background supporting these

recommendations are contained in the workshop proceedings including the individual work group reports. The reader may review those discussions in the context of the workshop agenda and obtain a more comprehensive understanding of the impressive array of ideas which converged on each and all of the topics, especially with regard to the philosophic tenets rooted in the international training experience.

In the next section is a proposed research agenda for the Office of International Training. It should be borne in mind that the agenda is for the immediate future and is supportive of the Agency's need for priorities.

CHAPTER 4. RESEARCH AGENDA FOR THE OFFICE OF INTERNATIONAL TRAINING/AID (S&T/IT)

The proposed research agenda has been developed as a result of extensive interviews conducted during the study with AID officials and representatives from other organizations and institutions, a review of selected literature, and an analysis of the workshop proceedings and conclusions drawn from the four work groups.

It should be emphasized that the recommendations for research are based on an analysis of needs in S&T/IT with regard to agency training programs, policy and resources. Therefore, priorities listed here may not be congruent with other priorities of interest to other parties, depending on the purpose and potential use of research findings.

While the study revealed a number of important research topics for international training as it relates to development, the absence of reliable data and information on those persons trained pervaded every discussion thereby clouding a number of issues. For example, virtually every work group was faced with the problem of <u>who</u> is being trained and <u>what</u> happens to them. Whether the topic of discussion was third country training, transfer of technology, costs and benefits or effectiveness of training, there was no information on some basic characteristics of persons trained such as employment, earnings, location, in addition to personal profiles of participants.

In terms of AID's policy on training, it would seem that the first priority would be to study the outputs of training. As one of the questionnaire respondents put it:

> "The most difficult problems which need research to improve overseas training for developing countries include:
>
> - Lack of information on the specific nature of problems abroad at the project/individual level;

- Lack of studies on the utilization of training received in the United States; and
- Lack of feedback by the sponsoring agencies to the training organizations on either of the above."

There have been very few followup studies on returned participants so that it is difficult to know whether training by type and field of study for various persons has been effective.

The following research agenda is based on a selection of priorities for S&T/IT with no particular ordering except for the first one, which is so designated as the first priority. All the others are considered as relevant, but do not represent any hierarchy of importance between them.

RESEARCH PRIORITIES FOR THE OFFICE OF INTERNATIONAL DEVELOPMENT

A. Analysis of Training Output (First Priority)

Topic/Approach

Conduct a sample study of returned participants to analyze the effectiveness of training and the extent to which goals have been achieved for: (1) the sponsoring agency, (2) the developing country, and (3) the persons trained.

An indepth field investigation should be an integral part of the study which includes personal interviews with host country officials, supervisors, employees, participants, AID mission personnel and other appropriate persons.

The methodology should also sample participants by a mix of key variables including age, sex, profession, field of study, professional status, career ladder and others to be determined. In addition, attitudinal and behavior measures should be a part of the study design. This research should be designed as soon as possible.

Problem/Rationale

There is little organized information which can provide policymakers with relevant information on the outputs/outcomes of AID Training Programs.

The paucity of concrete data on returned participants is a major obstacle to defining new policy and program direction. Also, the research findings should be crucial to improving the participant training program and providing feedback to training institutions and other relevant organizations. It seems obvious that rational decisions on training programs and training policy cannot be entertained in the absence of fundamental data and information on the outputs of AID's training programs.

B. Role of Women in Development

Topic/Approach

The role of women in development is one of the most important questions in terms of costs and benefits of training and the likelihood of increasing the labor force in developing countries. A study should be conducted which examines the role of women in economic and social development, and the types of training which have been done contrasted to potentially new fields of career professionals. The study should analyze the relative tradeoffs in training of women, likelihood of employment, differential earnings, longer term investment, and the social consequences of increased labor force participation at administrative and managerial levels.

The study methodology should focus on Asian, African and Latin American countries, but with particular emphasis on societies which have long histories of traditional divisions of male/female labor. Sample sites would include both urban and rural women in development. This study should be undertaken within the next two years.

Problem/Rationale

The role of women in society and development has become increasingly important in the last several years on a worldwide scale. Women are assuming more and

more responsibility in developing countries as they become participants in the development process. The potential loss of a large segment of human resources by foregone opportunities for training and education in developing countries can and does have serious consequences in terms of adequate professional and technical personnel. An AID study to focus on the role of women in development, exploring how they relate to human resources, can provide important information for donor and recipient countries.

In addition, this study can also make significant contributions on the economic impact of women in career positions and employment in the public and private sectors of developing countries.

C. Utilization of the Private Sector in Training

Topic/Approach

The private sector has made significant contributions to training in developing countries and, therefore, research should be done on how the donor countries, AID, and other organizations can effect cooperative linkages and relationships with the private sector, but particularly in the field of technology transfer. A study is needed to examine what specific contributions the technology of the private sector can make to improving technology training and reinforcing the technological infrastructure of developing countries.

Problem/Rationale

The private sector has significant resources and a long history of training for development. The cooperation between public and private organizations can not only provide new insights to improving training, but may also initiate strong incentives for business and investment in developing countries. The new emphasis the Agency is placing on the private sector and private enterprise are closely related and tie into the field of international training. Parenthetically, this study could also focus on private organizations in the developing countries and how the private sector can contribute to training and development.

D. Use of Regional and Third Country Training Institutions

A critical feature of the development process is the lack of indigenous training institutions and the resulting potential brain drain when students study abroad. A research study is imperative to assess national and regional training institutions in developing countries with regard to U.S. training and educational institutions. The study should look at existing institutions and examine their relative success or failure.

Such variables should be examined as numbers of courses and levels offered, curriculum, language of instruction, faculty, institutional credentials, resources for research and contributions to national, regional, or international problems in development. Of particular importance would be to sample existing institutions of developing countries in comparison to the level of education and training which is provided at U.S. institutions. An analysis of present and future capability, resources needed for self-sufficiency, and credentialing in particular areas, would also be examined.

Problem/Rationale

The debate on third country training has been going on for decades. However, recently the need to establish or utilize third country or regional training institutions has received a great deal of attention. It seems clear that third country or home country training is becoming of great importance to donor and recipient countries alike. No reliable information exists on the potential and success of third country institutions. This information would be of great value to the international training community including donors, recipients, training institutions, and other organizations and entities engaged in science and technology training.

E. Alternative Training Methodologies

Topic/Approach

A study on the alternative methodologies of training and their cost effectiveness represents a subject of importance to AID and other donor

agencies. For example, research relating to when participants should be sent to overseas institutions for training (i.e., mid-career, junior management level) can provide a different dimension to AID training policy. A mid-career scientist or technician might benefit more from training at a U.S. institution on a short-term or intermediate basis than compared to a participant who is just entering the job market after a protracted study period in the United States. This research would examine AID policy in terms of project training, fields of study, duration of training and funding for specific technical and professional fields. A key question to this research would focus on whether AID should be supporting training in different fields in terms of development and utilization of training in host countries. A research project to examine the cost effectiveness of alternative training modes could have significant implications for AID and the developing countries.

Problem/Rationale

The rapid loss of technology when participants return home after study has been a crucial problem in terms of retraining or refitting the professional with up-to-date methods and technology. Often, the value of science and technology training is lost when there is no followup or network to keep scientists informed and up to date on the state of the art. Alternative methodologies can affect post training in many ways, but one is the use of continuous and intermittent training as well as non-traditional curricula.

F. Analysis of Followup Career Assistance and Information Dissemination

Topic/Approach

Once participants return home from training and education in the United States, there is virtually no further contact between the former student/trainer and AID, training institutions or contractors, professionals in the field and professional organizations. This is one of the factors which accounts for "Technology Loss" when there is no mechanism for keeping the professional informed on scientific and technical advancements and achievements. This situation also affects the development process and may specifically have an impact on the success of AID developmental projects for which training and

education were provided. A yield on the training investment is therefore lost when no followup assistance and/or followup information is provided. A study on followup would sample a number of past and recently returned participants to examine how science and technology was used, what jobs and career ladders have been established, what issues and problems can be identified regarding state of the art, and what mechanisms can be established for effective followup career assistance and information dissemination on science and technology.

Problem/Rationale

One of the frequent complaints of donor countries, agencies and recipients of training abroad is that all, or most, contact is lost when the trainee returns home. This situation is further compounded by the lack of a technical information system which can provide the latest advances in the state of the art and technology breakthroughs. AID should capitalize on the investment in training and education by studying cost effective ways to provide adequate followup to training.

G. Study of Management Technology and its Applicability and Relevance to Developing Countries

Topic/Approach

The improvement of management and its application to third world environments continues to be a concern of AID and other international training institutions and organizations.

A research study on how management technology is affected by cultural, social, political, and economic conditions is one which directly relates to AID's success with development projects. The study should comparatively examine the socio-cultural contexts in which management plays a role and determine what management skills and knowledge are relevant for developing countries. The research should also identify how different cultures accommodate or adapt management technology, and whether different socio-cultural conditions determine management utilization of skills and what is relevant to local

needs. A cross-cultural study which looks at different levels of development and organization, economic, and social resources as well as cultural attributes should be designed with a view to adapting more effective training methods for developing countries.

Problem/Rationale

One of the key reasons many projects have difficulty in implementation is the lack of management skills and technology. This is a problem which involves a great deal of cost and human resources and has significant impact on whether projects achieve their goals and contribute to a developing country's needs. Clearly, the transfer of management skills and technology assumes as important a role in development as the transfer of science and technology training.

H. Study on Innovations in Training

Topic/Approach

A study on innovative training approaches that have been developed by private industry and/or the military can provide some fresh insight to AID's participant training program as well as other international training programs. The private sector and the military have often been very effective and innovative when dealing with civilian education and training in developing countries. This would include the innovative use of communication techniques, public affairs and utilization of human resources in various sectors in terms of institutionizing training in host countries and developing training capability, particularly in short term technical and vocational fields.

A study, particularly in short term technical skills, could reveal some very cost effective and innovative approaches to training in nonformal and technical environments. This study could be a relatively quick survey research type which selectively samples a number of private sector and military training programs in selected areas and countri s. An analysis of training methodologies and innovations would then form the basis for further research, if warranted.

Problem/Rationale

The need to develop innovative training techniques and methods is evidenced by ever changing conditions in developing countries and the problems encountered in the utilization of traditional U.S. formal and technical training for foreign nationals. Some agencies are working on the problem successfully, but a look at two of the largest organizational training efforts in the world should provide some new ideas on technology training and innovative educational techniques. Some of the innovations may even have cost-effective implications.

I. Research on Participant Selection Criteria

Topic/Approach

The principal obstacle to the success of most training programs and development projects funded by AID and other donor agencies is the qualities and skills of the persons being trained. The selection of trainees (participants) is an important part of the training effort. Factors such as relative age, background, and fields of study in addition to other characteristics are crucial in terms of training success.

Also, how close is the correlation between developing country needs, projects, and student objectives? A research study on the differential success by selection criteria variables could provide some critical information on the characteristics of persons being trained and their relative success in the country's development and/or professional jobs for which they were trained.

Questions such as "Are we training the right persons?" or "What are the predictors of successful training for participants?" might be useful outputs of this study. It may also provide missions with guidelines in working with host country officials in selection of the participant and, parenthetically, in setting criteria for aggressive recruitment of participants.

Problem/Rationale

The qualities and characteristics of the participant continue to be the single most important success variable. When participants are selected who do not

meet certain standards, the entire training project is jeopardized. The training also has long term effects with regard to change and development after the participant returns home. This kind of study would help to identify not only selection guidelines and criteria, but encourage more precise training and job objectives which, in turn, would assist in developing more relevant training programs.

J. Analysis of the Impact on Development From International Training

This study would attempt to identify the key variables in terms of training impact on the development process.

A series of case studies on countries which have made significant progress in science and technology and cross-national studies of science and technology indicators would provide some benchmarks on success criteria. The impact on training as it relates to other development processes such as national policy and strong commitment to development would also be examined as well as other government policies on trade, taxes, the private sector, etc. The extent to which this could provide a basis for looking at training as part of a larger development process may indicate training for upper level bureaucrats, scientists, and other technical fields. Training could be part of a national development plan on human resources (i.e., Human Resource Planning Boards and the relationship to training programs). This study would sample both successful and relatively unsuccessful efforts at institutionalizing science and technology in agriculture, energy, health, nutrition, and could provide crucial information on the role and degree of training in development.

Problem/Rationale

Currently, no single study can pull together all the variables on the impact of international training in development and the key criteria for utilizing training in science and technology to meet national objectives of developing countries. The results of this study may have significant implications on how AID views the role of training in science and technology and its development efforts. Admittedly, a research study on training impact is extremely difficult to design and implement. It usually requires a sophisticated

research design which can control for key variables over a long term period. Longitudinal studies of this kind, however, may have significant returns on the investment to the international training community and to the concept of the development process.

K. Study of Costs and Benefits of Training in Different Fields

Topic/Approach

An economic study should be conducted on the relative costs and benefits of participants trained in a select number of scientific, technical and professional disciplines. Such a study would provide AID with key information on the costs of training to AID and the host country (including the participant) and the relative benefits both personal and institutional as they relate to the development process and AID's training goals and objectives.

The potential outcome of this study would be to compare training in a sample of professional and technical fields (i.e., agriculture, bio-technology, engineering) in order to determine relatively whether costs and benefits justify training and to provide basic information for decisions on which fields AID yields a better return vis-a-vis development goals.

Moreover, such a study could document the relative costs and benefits of particular countries in terms of their relationship to socio-economic development in general and AID training and development projects in particular.

Problem/Rationale

A principal problem in the establishment of policy and programs for international training is the lack of sound economic information relative to how costs and benefits relate to development objectives and training programs and projects.

The provision of an economic analysis on these factors may sharpen the focus of training with regard to costs (investments) and benefits (returns) for both AID, the host country and the participants.

CHAPTER 5. SUMMARY OF WORKSHOP PROCEEDINGS

As part of introductory remarks made by Ms. Dona Wolf, Director of S&T/IT in AID, she noted that the workshop would help S&T/IT shape its research agenda in the area of international training. In a broader context, she expressed the hope that the workshop would serve as a catalyst to inspire other organizations to undertake research in international training.

Keynote Address

Topic: **"Training for Development -- An International Perspective"**
Speaker: **Phillip Coombs, International Council for Educational Development**

Mr. Coombs indicated that the discussion paper sent out to conference participants raised a good many questions and thoughts that could have been as relevant 10 or 20 years ago as they are today. The concepts were not new ones. He underscored the importance of recognizing the changes that have occurred over the last 30 years of experience with foreign aid and development of all sorts in developing countries and that these experiences have implications for today's policies and strategies in the area of international training. The number of learners in the developing world has roughly doubled over the last 20 years. Substantial progress has been made on various development fronts, but there is still a lot yet to be done.

Mr. Coombs identified key historical events and their implications with regard to several major areas of foreign aid. Institution building was the first area discussed. It was the central theme of foreign aid back in the late '50s and '60s. It became increasingly clear that developing countries could not be dependent forever on the know-how and expertise of more developed countries. Thus, developing countries needed to develop the capacity to produce their own experts and technology.

Limited effort was directed at creation of primary schools; great effort was put into secondary-level institutions including both general high schools and vocational-technical schools; and in higher education, many universities and other post-secondary institutions were built. Most countries are still far short of achieving universal primary education, especially in rural areas. However, the record, at least quantitatively at the secondary and higher education levels, is impressive. According to available information, secondary level total enrollment in the developing world as a whole increased from 21 million in 1960 to nearly 100 million in 1980, an increase of more than 350 percent. At the higher education level, mostly at colleges and universities, total enrollments rose from 2.6 million in 1960 to 16.4 million in 1980, an increase of more than 500 percent. Thus, developing countries have overshot their targets for secondary and higher education, and grossly undershot their targets in primary education.

Expansion of enrollment in developing countries as a whole has been substantially greater than it has been in the developed countries. In 1960, 45 percent of the world's total enrollments at all levels combined were in developing countries. Today, 63 percent of the total is in developing countries. With the rapid growth of the school-age population in developing countries, they have had to run fast just to stand still, and run faster yet to push up their enrollment ratios.

Bringing people from developing countries to study in developed countries was taken very seriously back in the '50s and '60s. The U.S. has always been the "fat boy" in that canoe. For the years 1980 and 1981, the total number of foreign students at various levels studying various things in the U.S. reached a total of 268,000. Twenty-six percent of these foreign students were studying engineering, that is, technology; and 17-plus percent were studying business and management.

Two-thirds of all foreign students were self-supported, 15 percent were supported by their own governments and only 2.3 percent of students were supported by all U.S. Government exchange programs combined, where the AID Participant Training Program is only a portion of that total. Thus, the AID Participant Training Program accounts for only a very small fraction of the total amount of international training in the U.S.

Training and education institutions that AID and other donor agencies, including private foundations, helped to build in the late '50s and '60s are today subjected to growing criticism that they are misfits. It is argued that they are essentially carbon copies of developed countries' institutions and they do not fit the local economic, cultural and social circumstances, and certainly not the pocketbooks of the recipient countries.

While this criticism is somewhat exaggerated, there is a lot of truth to it. Thus, the U.S. needs to consider how we can help remodel the institutions in these countries that we helped build to make them fit better, especially since these countries are making enormous investments of their own resources in existing institutions.

In the '70s, "nonformal education" came into prominence because the concept of development was broadened from GNP economic development to improving the general conditions of people. Thus, the focus was on the distribution of the GNP, not merely with making it bigger. There has been greater emphasis on rural development which was largely ignored in the focus on modernizing and industrializing the urban centers.

With the present emphasis on addressing the basic needs of the lowest income people, a tremendous number of new learning needs have been raised. They affect nutrition, family planning, production of small farmers, the status of women, and the welfare of children. This is a massive set of learning needs not simply on the part of those who would deliver the services but, more importantly, on the part of those who are the intended receivers. AID, among others, has taken the lead in trying to discover just what "nonformal education" is and how it can be used to more effectively address these learning needs.

The AID Participant Training Program, or the sum total of foreign study going on in the U.S., cannot be evaluated without a framework of AID and other donor agency development objectives, priorities and strategies that are not yesterday's, but today's and tomorrow's. The new emphasis of development strategy as seen by the U.S. and by more and more developing countries does seem to focus on rural development and basic social service improvements. So it should be asked, what is the participant training program doing to help meet the new set of learning needs?

Mr. Coombs next turned his attention to what is today called "transfer of technology." The focus on the use of technology as a means to disseminate information has been a recurrent theme in various AID administrations. The push has been for quick fixes to a huge, complicated problem of providing appropriate learning to millions of people. The U.S. thrust partly reflects the view that U.S. "success" in economic growth and development is a function of the capacity to create technologies and, especially these days, high technologies.

In Mr. Coombs view, taking U.S. technologies and simply transplanting them to developing countries so they will somehow do for them what they have done for the U.S. is a gross over-simplification. Looking at technology broadly in terms of ways and means of doing things, the scope of possible technology transfer from the U.S. to other countries is expanded. While education and training are the carriers of technology, they carry many other important things, including culture, attitudes and values.

A tacit U.S. assumption often made is that whatever technology is needed, high or low, the U.S. has it. However, technologies to help developing countries to pull up rural areas by their bootstraps may not necessarily exist in the U.S. The U.S. needs to think harder about how to help developing countries strengthen their capacities to create appropriate technologies to fit less dramatic tasks such as improving nutrition and health.

The U.S. prides itself on its managerial capacity to get things done and so the U.S. puts great faith in management training. Why some projects are implemented the way outsiders would like and others are not is not solely a lack of the use of management skills. The nature of the culture deeply influences the way projects are implemented. Things get implemented rather well in Korea and Taiwan but not so well in South India and other developing countries.

So-called "management scarcities" are deeply imbedded in the nature of bureaucracies in all countries, but bureaucracies behave somewhat differently in different countries. In a pure hierarchical bureaucracy, the fierce incentives for promotion has a lot to do with why projects do not get implemented. The class structure where everybody looks down on those below them and where they are locked down upon by everyone above them has a lot to do with why projects do not get implemented.

Again, Mr. Coombs felt that a harder look at the real reasons for this so-called poor implementation is needed. Until sociological and cultural bureaucratic factors are looked at, all the failures should not be blamed on the recipient countries assuming that a well planned project did not work.

On the question of cost benefits, Mr. Coombs pointed out that there have been some very interesting and somewhat useful exercises done in the field of formal education on cost benefits relating estimated costs to wage scales of people emerging from the system.

However, transfering that kind of cost/benefit methodology over into evaluating the relative effectiveness of different kinds of international training is inappropriate. The real test there is not the later earnings of the people who got trained; the real test is the practical contribution of that training to the development of the country concerned. While that cannot be measured with caliper precision, some good judgments about it can be made once the facts have been carefully reviewed.

Finally, on the matter of research, Mr. Coombs felt that quite a lot could be learned from past research experience in the U.S. relating to development and particularly that which has been funded by AID. Some of it has been certainly very useful. However, a good deal of it has been useful to the people who did the research, but not to the users of the research such as policy makers, program planners, managers, and the like.

Mr. Coombs expressed the hope that future research in this area will begin with the questions the users have on their minds, will involve the users in the conduct of the research, and will report the research in terms comprehensible and useful to the users. Otherwise, he noted, we are not subsidizing research to help developing countries, but to help our own research institutions.

While there is great room for useful research, it must get at those very important factors in all situations that cannot be measured quantitatively, and must be viewed very carefully. Such factors often are much more important in their outcome than those things that can be measured and put into a computer.

Panel Presentation

Topic: The Role of International Training in Development: Research Issues
Chair: Raga Elim, S&T/IT -- AID

Participants: Elliott Berg, University of Michigan
Derek de Solla Price, Yale University
Michael Bentil, International Management Consultant
Robert Leestma, National Institute of Education
Syed Hussein Alatas, National University of Singapore
John Eriksson, S&T-AID

Dr. Raga Elim introduced several concepts which affect training and training research. First, he noted that it is very important to perceive that behavioral change is a key element in the development process. There are at least three ways to induce behavioral change in any system or organization. One way is to train or retrain the individuals who are creating that system. Another is to change the policies which govern the organization. A third way is to introduce personnel and incentives both for the organization and the individuals. While there can be others, research can be undertaken with regard to all three of these elements of change. It is important to be aware of how changes brought about by policies and introductions of incentives can influence the context in which training is to be applied.

Furthermore, research on any aspect of training can help influence people's attitude toward change itself. As generally recognized, people are reluctant to change. Research can serve as the engine that promotes change -- first in attitudes, and then in behavior itself.

On another point, Dr. Elim pointed out that training is typically undertaken to meet current needs. That is also a necessary element to meet future needs. However, training has often not kept pace with changes in available training modalities and methodology as developed in other fields. Research can guide the effective use of new methodology and models, for example.

Available U.S. manpower development systems may not be appropriate for training individuals from developing countries. The general approach to training by the U.S. is, of course, a western one, based on the scientific method. In some cultures, learning is accompanied by observation or trial and error. AID has trained tens of thousands using the scientific method which may or may not clash with the traditional approach used in their home countries.

Another kind of potential conflict, or at least difference in perspective, can occur between donor organizations such as AID and the host countries where donor organizations work. Proposed and enacted donor organization programs may be focused on different priorities than those envisioned by the host countries. Research is needed to develop a system whereby donor organizations and recipient countries work together to identify needs, design programs to meet these needs, and schedule program implementation.

Finally, Dr. Elim underscored the need to make better use of available research that may have applicability to issues in international training. Therefore, AID proposes to develop a system to categorize its research findings as well as search other data bases for relevant research. With such a foundation, AID can undertake research in new areas to help improve international training.

Elliott Berg focused on the issue of on-the-job training. From his point of view, it is on the job that most people learn almost everything they spend their working lives doing. He proposed that the institutions which are supposed to provide on-the-job training are very seriously flawed, especially in the poorest countries.

Mr. Berg identified three major ways that people learn skills for jobs in the developing world, especially in the poorest countries. One is through technical assistance which acounts for about a quarter of the AID flow in money. After all, the classic technical assistance relationship is between the expert, so-called, and his counterpart, so-called, and in that relationship, great things are supposed to happen.

The problems of technical assistance are well known. Anybody involved in technical assistance must recognize that extremely little learning and extremely

little on-the-job shaping of attitudes and behaviors takes place as a result. There are a lot of reasons for that. Some of it has to do with the incentive structure in the organizaton in which the technical assistance person works. A lot of people, mostly young, not very well trained, with little general formal education, are put up against somebody older, more experienced, much better paid, with a motivation to perform a job and not to train. These factors in the relationship between technical assistance provider and trainee highlight why that kind of relationship very rarely works well. The efficacy of the technical assistance relationship deserves a hard look.

The second way that people learn skills for jobs is project-related. AID and other donor institutions spend a lot of energy providing training in all of the technical sectors related to particular projects.

Mr. Berg hypothesized that most project-related training has been done in an extremely perfunctory way. Again, the incentive structure inside the organization that is administering the training really runs in all the wrong directions. The people are there to do a job. They are not there to train somebody. Doing a job is the basis upon which they will be judged; that is, what they will be paid for. Project-related training usually involves identifying individuals, then sending them off to some school in an industrial country. It very rarely goes much beyond that.

The third vehicle for training is the institutions of the less developed world. These institutions that are supposedly going to dispense training not only have no training orientation themselves and not much competence, but they are extremely poorly organized.

A young man or woman with the best general training, put in any public or even many private enterprises in developing countries, will see that nothing really works very well. People sit around at meetings and nobody takes notes. The general pastime is to shout at secretaries. There is no delegation of authority. All the things in badly run organizations are distilled in the organization in which he or she works.

Thus, individuals do not learn how things are done, and after ten or fifteen years, they are probably ashamed to admit that and don't know quite where to start again. What happens is that a whole group of people are put into job situtations in which there really are no on-the-job learning vehicles for them.

Derrick de Sola Price, with an English PhD in physics, spoke of his own experience coming to Washington, D.C., on a fellowship in 1946. He became rather worried about being made over into a little American and having quite different training than that which he had in England. He talked about his concerns with a variety of individuals, including the cultural attaches at the British Embassy in Washington who later became well known. They were Charlie Snow, who became Lord Snow, the novelist; and Alex King, who became a Science Policy Chief at OECD and the Club of Rome. On their advice, he went to Singapore after his year in the United States and participated in founding the first colonial British university.

As a result of those experiences, Dr. Price invented the term "brain drain," which Charlie Snow picked up and introduced in Parliament. Since then, Dr. Price has seen more than 30 years of social science research on the phenomenon of "brain drain" and the associated problems of academic imperialism and scientific and technological colonialism. He suggested some lines of research which could build upon previous research.

First, he noted that for more than 20 years -- maybe 30 -- that it is an almost unforgivable sin to take a student from a developing country and train them in a developed country. The sin is that such students are made over to some extent in the social and political doctrines of their country of training.

What results is an enormous leeching of the manpower. Approximately half of the people so trained never return to their country of origin, but this is only one of the sins. Of those who return, more than half find employment with firms originating in their country of training. That is, the little boy from Singapore who comes to the United States for training has a 50 percent chance if he does go back to work for IBM-Singapore.

There is more to it than this: One of the things known is the sociology of the structure of the scientific and technical communities. In science and

technology, the sociology is acutely pyramid shaped. At the bottom is a very large number of people who are more or less transient, who are introduced, never take, and disappear again. More than half the people in science and technology in the country, developed or undeveloped, are ones that you have never heard of before and will never hear of again. At the top of the pyramid is a rather few who stay the course. The developing countries simply do not get their share as a result of foreign training.

Secondly, Dr. Price noted that there is an alternative to foreign training that has a high payoff: do not send students from developing countries to the U.S.; let the U.S. send teachers to developing countries. Sending the teachers introduces a much larger employment base because a very large part of the manpower potential in science and technology in any country consists of the people who are doing the training rather than the ones being trained. It is extremely important for a country to build a large cadre of scientists and technologists within their own country.

Dr. Price pointed out that there is a very large difference between science and technology. Science is extremely universal. It ranges over all countries and, like seagulls, there is only one species or a very few species because of the large ranging. Science is not particularly sensitive to the social and political institutions or wishes of the people. There is no such thing as "underdeveloped or developing physics."

In engineering, it is otherwise. A country has a certain autonomy to pick and choose their own technologies and develop them. By looking at technologies like agriculture or medicine, it is quite obvious that a country cannot survive without the home base of an autonomous agriculture and medicine that goes all the way up to the research front because, again, the value of the research front is not the knowledge that it produces, but the fact that its participants have bought a ticket of entry to the world club of knowing what goes on.

In agriculture and medicine, survival is not possible without joining the world club and doing the research. The developing countries, many of which are tropical, tend to have their own diseases and their own crop pests and the like. Thus, the developed countries cannot and will not do the job for them; developing

countries need their own medical schools and research institutes. It has only recently become obvious that exactly the same thing is true of technology.

The key to technology is the development of the acquaintanceship with hardware. Because of the policy of training people abroad, the developing countries are woefully deficient in their facilities for teaching experimental science and technology and having the good technological "junk" for kids to play with from elementary school upwards. A country where twelve-year olds don't use telephones, typewriters and computers is never going to get any technological autonomy, and can never develop the appropriate technologies as it has had to develop its agricultural and medical technologies.

Dr. Price expressed the personal view that the management technologies are probably very similar. Management skills are by no means universal, but depend on the social, political, religious, and cultural bases of the country. To import Harvard Business School or Yale School of Organization and Management would be a fatal error.

Yet, the U.S. persists in the crime of training students from developing countries. There seems to be a certain do-gooding tendency of believing this is a fine and noble thing to do, even though developed countries have known for years that it is not. There is also the sad fact that it is to the advantage of the developed countries to train developing country students for profit. Since educational systems of developed countries have been saturated and peaked out, there is increasing pressure to admit foreign students in order to keep up the supply of students. This is difficult to see by looking only at the United States. By looking at Britain or France and their educational policies, much more dislocation and pressure to take in foreign students results as a way of making a profit and building the political and social capital of winning friends for the country. Dr. Price maintains that it does not, and that is an outmoded colonial policy.

What is needed is a great deal more research on the comparative features of sending students abroad and sending out teachers. There has been a turnaround; it is now to the profit of a developed country to get rid of some of its scientific and technical manpower by exporting them.

The United States really does need a large outflow of teachers in order to make room for the young ones who need jobs. One of the things the U.S. could do is to institute a new sort of Fulbright policy of making it relatively easy and cheap for countries around the world to acquire American teaching manpower on a short-term basis. It must be teaching manpower that comes with the technological availability of instrumentation, experimental research, the computers that are needed for computer training, and so on. That sort of teaching is vastly underdone, and needs assistnce now much more than foreign training.

Very large numbers of people from developing countries have settled in the U.S. and in other foreign countries and represent a large and rather permanent brain drain. The U.S. and other developed countries have not learned the lessons laid out in the classic work on "brain drain" edited by Walter Adams in 1968. Lessons have also not been learned from the NSF report on immigrant scientists and engineers in the U.S.

Helping developing countries develop autonomously in their own country by importing the teachers rather than the students is long overdue. With political instability in any developing country, there is a very large tendency for parents to guarantee the future of their children by getting them out of it. Dr. Price illustrated his point by describing the situation in Malaya when he was there. It was far easier and cheaper to get a bright boy or girl sent to Oxford, Cambridge, Harvard, or Yale than to get them a graduate fellowship to continue studies in Singapore or in Malaya. This is a tragedy and one worthy of research.

Michael Bentil concentrated his attention on management training in the public sector because all of his career has been in public service. He explained that he was in the Ghana government for about 28 years before he was "drained" out of the country to become an international civil servant. He also served in the United Nations for 11 1/2 years.

He discussed management training from two points of view: from the point of view of a person who at one time had been at the receiving end of technical aid from bilateral and donor agencies; and then from the other end as a person involved with international technical assistance, giving aid to the different developing countries.

He identified lack of national policy on training as one factor militating against effectiveness in management training. In many countries, because of the lack of training policies, training is adopted on an ad hoc basis. There is a need to study what should be done to ensure that developing countries develop appropriate, sensible and constructive training policies that are linked to government personnel mnagement policies and derived from the development needs of the countries.

Not only should the technical aspects of training be considered but, more importantly, attitudinal, cultural, and other environmental factors should be carefully considered as they are basic to the success or failure of any programs that are developed.

Mr. Bentil stated that more attention should be paid to the target groups for training. Perhaps in the early stages of developing countries, individuals were sent overseas for training. Mr. Bentil questioned whether the U.S. wants to continue this type of approach or wants to focus on groups whose training would lead to multiplier effects. In determining the target groups, careful consideration should be given to decision-makers, both in the political arena as well as bureaucrats, who influence government policies, then direct the implementation of the programs.

Careful consideration should also be given to the teachers at the training institutions. They should become a target group. Another target group is the one that manages scientific and technological programs. In the past, attention has been focused on the training of administrative generalists. There is no point in applying high science and high technology when no one knows how to manage programs which have these orientations.

Mr. Bentil suggested that research also be undertaken with regard to the appropriateness of the curricula. In the past, curricula was based on programs developed in developed countries and other countries and, in many cases, the content and design was found to be inadequate or irrelevant. The appropriateness of the curricula is dependent upon tailoring it to local circumstances in individual developing countries.

Mr. Bentil also identified the need to look at the institutions which provide training. The training program derives from the fact that most of these institutions were developed on the patterns exported from developed countries, and they haven't had time to research their own performance to adapt the programs to local needs. In this present age, it is possible that developing countries can help one another.

Mr. Bentil noted that part of the challenge of the U.S. program today is to strengthen some of the institutions which the U.S. helped create so they can help other institutions through transfer of teachers and through fellowships within the developing world. Such an approach might reduce the problem of "brain drain." Mr. Bentil also suggested that developed countries can use some of the "brain drain" to provide better assistance to countries through an arrangement of mutual cooperation.

Mr. Leetsma discussed five general concerns that deserve preliminary consideration as AID looks at establishing or refocusing research priorities in international training. The five concerns fall broadly in the field of technical assistance. While some of the five points involve basic questions and questions that have been raised before, relatively few of them have been the subject of systematic research or at least of much systematic research.

The first point dealt with the knowledge and attitudes toward the developing world held by trainers providing technical assistance. Mr. Leetsma illustrated his concern in this area by drawing from his own experience. He was a member in an early Peace Corps training program where a very bright and competent young assistant professor of psychiatry was teaching pure Freudian doctrine to Peace Corps volunteers about to go to Thailand. The trainer had absolutely no concept of Buddhist culture or its dominant influence on Thai administrative behavior or many other kinds of behavior. The relevance of a classic Freudian approach to Thai culture was low.

The second point involved the training process itself. While AID has distinguished itself over the years with a good deal of sensitivity, more research is needed. Although it is known that the lecture method is not a very

effective method for changing people's behavior, the U.S. tends to use that approach more often than not in training programs for those from other countries.

The concept of including practical problems which the participants face as part of training and organizing the training efforts around such "real" problems should be researched. This approach could be contrasted with the standard approach which includes examples from Western textbooks or from the American cultural context.

Furthermore, Mr. Leetsma suggested that training in many situations on an intermittent basis may be more appropriate rather than one concentrated effort of one month or one year with no further followup help given. Sometimes there is a brief period of training to familiarize, to develop sensitivities, to get some rudiments of how to begin, and then later another effort to move along further in understanding of specific skills. It would be interesting to survey the experience of people who have worked in effective training programs with the developing countries. For example, it would be interesting to survey master's or higher degree students whose research projects focus on problems of the local area where standard science and appropriate technology is adapted to solve the problems.

Another aspect of the training process is one where AID really stands tall. It involves AID's long-running sensitivity to the importance of what is often called the communications process. That is, as part of the training program AID spends some time helping the participants understand how they can effectively share their experiences and teach the training material to others back in their home country.

The broader issue of understanding and effectively using the communication process would be worth research. While it probably would produce a predictable result, that would be a powerful bit of evidence to use to stimulate everybody concerned with international training to search their souls about more effective training.

Mr. Leetsma's third point focused on the extent to which training programs involved former participants in the training process. It would be interesting to

research how people from the LDCs who have been trained in the U.S. have applied their training in the local cultural context, adapting it as necessary. Such individuals, or those of the next generation, might make far more effective trainers or designers of training programs than U.S. counterparts. Some institutions have tried to take advantage of former participant expertise.

Mr. Leetsma felt it would be interesting to research whether the U.S. continues to offer training from an American perspective with materials that are basically American in origin. There are some case study materials from developing countries with faculty members or teachers who have principally an American or Western origin. However, after 20 years, there should be a much more international cadre of people involved in training programs. That cadre should include more than academics of whatever country of passport, but people who have some sensitivity to the realities and the dynamics of the developing country.

Mr. Leetsma's fourth point concerned the need for more longitudinal research on both the direct and the indirect benefits of the training. Research should not just consist of the episodic effort at the end of a formal training program or the survey of a small sample selected from a widely diverse set of countries from which no respectable conclusion or generalization could be drawn. Research should consist of some major efforts that involve following trainees over time. Major efforts could look at what was achieved in terms of what the trainers or the sponsors of training expected or wanted to occur; how well the objectives of the formal training program were achieved by the participants five or ten years later; what the participants themselves think about the utility of the training experience after they have tried to put it to work; the nature of the training experience they had; and what suggestions they have for improvement of the training program. In addition to collecting information from former participants over time, it is important to look at the reactions of other key people in the host countries from which the participants came.

Mr. Leetsma's fifth and final point concerned systematic research on the theory and practice of training in the counterpart relationship. There is substantial experience that is American through AID and predecessor agencies, but certainly there is much experience in other international and multilateral international bodies. That experience may provide a body of knowledge, although modest, that

identifies elements of what makes an effective counterpart relationship for training. If such a body of knowledge is available, Mr. Leetsma asked whether it can be used to prepare people to go abroad.

Hussein Alatas posited that there is no problem of development in the developing societies. To support that premise, he discussed several basic issues. In science, the first step in problem solving is definition of the problem. If the problem is accurately defined, the rest follows. The reason why there is no problem of development is because the facilities for development are there to be used. The fact that developing countries did not use all these facilities is a problem to be addressed. The problem is one of motivation for development.

Every activity undertaken by human beings has to take place within the context of a climate. There is a climate of sports. There is a climate of business. There is even a climate of prostitution. Without the climate of prostitution, prostitution will not thrive.

It follows that there should also be a climate for development. If there is no climate for development in the country, no matter what is done about the technical sides of development, the development process will not be very positive. The most important element in constructing the climate of development in developing societies is the ruling class. It is this group in power that can ensure that the administrative efficiency of a developing country is maintained. It is the group in power that can create a situation of employment of what is most important, the joy of living.

If a negative group is in power, it can depress development by fostering inefficiency, poverty, and "brain drain," among other problems. What is needed in terms of real development is a positive group in power who can create a movement for development.

While it is not the task of the AID or anyone else to create a positive group in power, it is a task for all those involved with development to understand the nature of the group in power. Mr. Alatas illustrated his point. It is not true

that in the developing societies people are inefficient. It is true that people are inefficient in administration, but they are very, very efficient in corruption, in the organization of crime, and in power politics.

It is not true that there is no norm of efficiency. Rather, there is a misguided norm of efficiency followed by the group in power.

In assessing development as a whole, most of the countries in Asia have had their own power groups since after the Second World War. These groups have gone through a period of about three and one-half decades, and very soon will approach half a century.

As indices of development, thousands of schools and factories have been built and energy consumption is up. If these indices are used, there is a great deal of development going on in the developing societies.

Mr. Alatas suggested another set of indices. In the developing societies there has been an increase in poverty the last three decades. There has been an increase in diseases. More and more people are suffering from many things in many areas. There is a decreasing accumulation of knowledge as illustrated by the lowered standards of the varied disciplines. There are many negative things happening.

To assess development in an area, both negative and positive factors must be considered. Overall, Mr. Alatas felt that the result is mostly negative. To support his view, he noted that no country can develop in the hands of corrupt groups, regardess of the political party affiliation of those making up the groups. Any problem, including "brain drain," in the developing society today can be traced back to the ruling group in power.

Mr. Alatas invented the term "mind drain" to complement "brain drain" invented by Professor Price. "Mind drain" is not known because the paper titled "Intellectual Activity in the Developing Societies" has not been published. The paper was submitted to the World Congress of Orientalists in 1968.

Mr. Alatas defined "mind drain" as the drain happening inside developing countries. While the brain of the individual is in the developing society, his mind is drained in ability to perceive and think about problems and everything else indigenous to developing societies. He approaches problems in the developing country in a manner suitable to his place of training. He could not conceive of new problems. He could not even classify what is going on in his surroundings.

The problem of "mind drain" is peculiar to the developing societies, and it must be tackled by the developing societies. Because of the very existence of "mind drain," attention is not focused on what kind of leadership is appropriate to address the problem. To complicate the issue, political and social scientists from developing societies have suggested that corruption is consonant with development; thus, there is less focused attention given to and less activity against the problem of corruption.

John Eriksson stated that both training and research are very high among the priorities of the Agency, and particularly of Mr. McPhearson, the AID Administrator, and Dr. Brady, the head of the Science and Technology Bureau. A policy paper on basic education and technical training has just been completed and was being printed at the time of the conference on research priorities in international training. The policy paper stresses the importance of basic education and the need to increase the efficiency of basic education systems so that access can be extended, particularly to girls and women.

There has been considerable research on the importance of expanding education and training to girls and women. The impacts of education and training cut across a range of fields including production, health, nutrition and family planning. From a training point of view, it is important to determine what mechanisms and policies are needed. For example, are women particularly effective as training agents in reaching girls and women in developing countries?

The current administration continues to place a great deal of emphasis on assistance, supporting efforts of developing countries to meet the basic needs of

the majorities of their populations in a sustainable way. But there are new emphases on what are considered to be the most effective means of reaching that objective, including seeking greater reliance on the private sector. For example, Mr. Berg and others, focused on what kinds of mechanisms are most effective in meeting the training needs of the private sector, particularly in the area of management. Another important cross-cutting means, which has been emphasized in the current administration, is policy dialogue with key individuals in developing countries.

One topic that received considerable attention in earlier conference presentations was the climate in which training is given. Mr. Eriksson was reminded of one of the conclusions of a series of seminars in the area of training in the United States for developing country nationals given eight or nine years ago. The number of trainees from developing countries who were studying in the U.S. and other developed countries represented a very small drop in a large ocean.

Earlier, Professor Derek de Solla Price put forward a basic proposition that training in developed countries is something in which the U.S. should no longer be involved. On the other hand, can a case be made for training in developed countries that both in benefit terms and in cost terms minimizes brain drain? This is a basic issue deserving of research.

Another research issue suggested indirectly in earlier presentations involves financing training and education, including user fees and self-financing components.

Still another research issue suggested by others, and most explicitly by Mr. Bentil, was the proposal that AID and other donors look closely at the institutions they have assisted in developing countries with regard to their potential to assist in meeting training needs in lower income countries. One might think particularly of regional institutes, not only those that have been mentioned but also the Asian Institute for Management in the Philippines, and the potential of such institutes for providing appropriate training for countries in the region.

Group Discussion

Individual panel members responded to a variety of questions posed by various members of the audience. Asked to expand on how "brain drain" could be turned to advantage through mutual cooperation of the losing country and the gaining country, Mr. Bentil noted that the U.S. could identify countries experiencing various skilled manpower shortages, establish some type of cooperative agreement with such countries, and then use "drained" citizens to provide assistance to the developing country of their origin.

Dr. Price added that a research program should be instituted on that topic. He noted that there are several countries that have instituted deliberate and rather high-powered programs to attract so-called "brain drains." These include Turkey, Brazil, and the Scandinavian countries. In all of these cases, it has been a singular failure for a rather large expenditure of time and effort. Rather few people have been attracted back.

He expressed the view that the goal of such programs is counter-productive for two reasons. First, the hurt is not that the people are lost. A very large quantity of people are lost because of the normal attrition process that is central to the pyramid structure of science and technology, the training of which has inherently a very large transient flow-through in order to produce a few. And these are the flow-through people.

Secondly, "brain drain" is only partly due to the de-culturization and the culturization of students by foreign training. Other reasons include political persecution and social mobility. In many cases, the best thing a parent can do for a child is to get them out of the country of little opportunity into the world and it is a feature of science and technology that their international components give them a career they can carry around in their head or in a briefcase. The scientists and engineers of the world are peculiarly mobile and, therefore, able to survive by getting out of a country when the climate is unsuitable for reasons of racial or political persecution, etc. "Brain drain" for such reasons is not bad.

Research should focus on the experience of those countries that have tried to attract people back and on the function of "brain drain" because it is not entirely a bad thing. Part of it is natural, part of it is good.

As Dr. Price noted earlier, benefits of the training process accrue from the people who are doing the training rather than from those trained. The strength of a developing country is often the people that it has who are involved with training and world knowledge in the area. These individuals represent the highest and best personnel resource of the country, rather than the comparatively trivial direct result of the people who are trained.

David Smock of IIE commented on several assertions made by Dr. Price in his presentation. He strongly argued that there was value in both the approach of bringing students from developing countries to the U.S. to study, and the approach of helping faculty members go abroad to teach.

Dr. Price's focus on sending teachers abroad seemed to be very heavily based upon his assertion that 50 percent of the students who come to the U.S. remain. While admitting that there is very little good data to go on, Mr. Smock asserted that the 50 percent figure is a gross exaggeration. According to his calculations, approximately 16 percent was more accurate.

Mr. Smock referenced an article written by Bill Cotter, who at that time was President of the African-American Institute, addressing the advantages and payoffs from investing in students studying in this country as opposed to sending professors abroad. One of the points made in that article was that to train an African professor in this country who is going to go back and spend a lifetime teaching at an African university is by far a better investment than to send an American or someone from another developed country to go and teach for two or three years. While not arguing one against the other, Mr. Smock asserted that Dr. Price's notion of the complete virtue of one as opposed to complete error in the other is distorted.

Dr. Price responded to Mr. Smock's comments. Because Dr. Price felt that bringing students to developed countries to study is so wrong, he stressed the importance of researching the alternative of sending teachers abroad.

The figures on the extent of "brain drain" are heavily dependent on the level of the training. The 50 percent figure used by Dr. Price earlier represented the overall figure for undergraduate training in the early 1970s, the last time there was serious research on the subject. The extent of "brain drain" for graduate training is rather less. "Brain drain" depends a great deal on the development of the infrastructure and the mechnaisms by which the returning student is able to get a job. In many countries, education and training are developed long before institutions are developed, so that the returning student, or would-be returning student, would have no place to go. Further research should be done to determine the current levels of "brain drain."

In a broader context, Dr. Price described Japan as the one case history of a country that "gets it right." Japan in the Maji revolution had a very clear policy that was exquisitely modern by today's standards. It included acquiring a technical language, putting it in its own dictionary, promoting the use of scientific and technical language in Japanese, importing teachers rather more than sending out students, and not sending out students until they had had the benefit of being graduate students at home.

Mr. Hoelscher made comments in two areas. In one instance, he supported Professor Price's position that sending teachers abroad is very much worthy of a good research program from which data can be published, widely disseminated and then understood. He expressed the concern that it is very dangerous to use figures like 50 percent or 16 percent to describe the extent of "brain drain" because it is a very complex phenomenon. Based on his own experiences, he noted that the percentages of students from Taiwan, India, and the Middle East who return from training in the U.S. differ substantially in size and in terms of the level of training that was taken. Thus, single number percentages oversimplify the phenomenon and are misleading.

On a second topic, Mr. Hoelscher felt that Mr. Bentil's suggestion of the "mind drain" was worthy of examination as a very important phenomenon. He expressed his repeated distress when visiting countries in Asia, or more recently the Middle East, and seeing his own students who were back teaching for five years who had fallen seriously behind in their own profession -- a profession that he shares. He explained that those students were unable to stay abreast in their field: they did not have the libraries; they did not have the opportunity to attend

local and regional meetings; and they had no opportunity for collegial discussion groups. In the AC College of Technology, in the University of Madras, it is very much different. While not knowing whether one can generalize from that college, it would seem worthy of study in order to reap the greatest reward from the training investment already made.

Professor Rabkin from Montreal addressed an issue raised by Professor Price. Very little attention has been paid to the history of the development of science and technology in developing nations. He expressed surprise at learning that many people from business schools in African countries attended a seminar on "diffusion of science in peripheral countries." These were people who are honestly interested in how science gets diffused to areas outside Britain and the United States, Canada, and France.

The history of science may be important to include in training of people to become science policy bureaucrats or technology policy bureaucrats. In discussions with people from some Arab countries, Dr. Rabkin learned that they were totally unaware of the experience of the Ottoman Empire in importing science and technology, and yet those very countries were part of the Ottoman Empire for many centuries.

Dr. Price commented on the appropriateness of teaching the history of science by referring to a paper on the topic in Walter Adams' book on the "brain drain" by Stefan Dedier, who presents a history of academic and professional migration and makes the case not only for historical studies but for comparative ones. Dr. Price stated that the picture is distorted if only foreign students in the U.S. are the subject of study. For example, the country that holds the world record for foreign students per domestic student is Egypt. By looking at how and why the Egyptian universities educate large numbers of other Middle Eastern students and what the effect is that it has produced, the perspective on what it is that is happening is quite different. The country that makes the biggest political capital out of capturing foreign students is probably not the U.S., but the country that has the largest diplomatic stake in its international component, France. France is the traditional country of refuge for a great many countries of the world when things go wrong.

Dedier makes the point in his book that foreign students studying outside their own country should be researched internationally with some historical perspective,

not just in the context of the U.S.. This is a longstanding problem that is only taking slightly different turns in today's world.

An unnamed member of the audience commented about the nature of Professor Price's statistics on "brain drain" relative to statistics presented by Dr. Coombs. Of the 2.3 percent of foreign students who come on scholarships, either from the U.S. Government or other institutional scholarships, most go back. With regard to the two-thirds of foreign students who come to the U.S. on their own, the issue of "brain drain" is a philosophical one. Incentive offered by home governments would help. Experiments in Brazil and other countries failed because these governments provided only partial incentives. They gave them good salaries but no lab facilities. Most scientists who went back after six months were very frustrated, based on the experiments and the results from job satisfaction studies in this area. Money alone is not enough for job satisfaction. So there is a need for research in this area.

The same member of the audience pointed out that research on "brain drain" in the eighties and beyond should look at both negative as well as positive impacts. It has surely helped some countries in the world. For example, pushing out scientists and technicians who have the highest level of unemployment reduces the unemployment problem in this area.

David Gould commented on linkages between development and training suggested by several panelists. There is an assumption that training for science, technology, or management will lead in one way or another to development. That is the justification for AID and other institutions working so hard in this area.

On the other hand, there is a certain amount of evidence that, at least with respect to the countries in question, there has been de-development, undevelopment or under-development. Dr. Berg was the author of a controversial, but mostly uncontested, study for the World Bank about the development in Africa over the last 10 years, which came to the conclusion that in most countries there has been less development, probably undevelopment, or more under-development.

Mr. Gould concurred with Dr. Alatas' provocative hypothesis that the reasons have less to do with culture and more to do with the economic, social, and political

structures of the countries in question, which he referred to under the term "ruling class." Having written a book about corruption in a certain country in Central Africa, Mr. Gould testified that there is a lot of weight in the hypothesis that the ruling class and its embedded structures, policies and interests have a great deal to do with this under-development. As Dr. Berg reported, poor policies and bad advice regarding development has been the case for many years. What results is a dichotomy whereby managers will be trained to contribute to development, yet there is less and less development.

An interesting research question is the extent to which those who come to the U.S. for training or whom the U.S. trains in developing countries in management and technology are themselves junior members of the ruling class. This is very often the case for the son or the cousin of the minister of science and technology.

Some of these students, who were themselves already embedded ideologically, socially, and culturally as the upper class, may not be able to make much of a change on how the ruling class operates. There may be open-minded people or opponents of the regime who come here for science and technology who may, through their training, become co-opted. Certainly upon return home, if they want to survive in their country, they will invariably become co-opted, short of a revolution.

Mr. Gould wondered whether the people whom the U.S. trains conform to the hypothesis that upon acquiring their training they go home and contribute to development; orm contrarywise, do they acquire useful techniques which are put into the service of the ruling class, resulting in policies and programs which will impoverish, oppress, and under-develop the populations and the country even further?

Dr. Berg responded to Mr. Gould's comments. For any of that chain of argument to be acceptable, first it is necessary to accept the basic proposition that the "ruling class," so-called, is a major factor in retarding growth and development. While it may be that that is true in some countries of the world, the shift of the elite at the top will bring some good things and some bad things. From the point of view of economic growth and development, the empirical evidence is that the political or ideological complexion of the leadership does not really change,

except in the more extreme cases. Thus, it is necessary to identify the "good guys" in positions of political leadership. These would be men who have taken the stewardship of their countries and those economies in a direction that the U.S. would applaud.

Given the political setting, the U.S. job as trainers is much more modest. It is to teach people how to attack very limited sets of problems with very narrowly defined tools. If someone becomes a physicist, they learn how to do physics. If someone is going to manage, they learn how to run organizaions. Underlying this approach is the notion that somehow these skills will be harnessed by society in a fashion that is going to be determined by forces over which the U.S. has virtually no control.

Mr. Bentil also responded to Mr. Gould's comments. He noted that Mr. Gould raised a very complex, difficult and politically very sensitive question. From his limited experience, both at the national level and at the international level, Mr. Bentil expressed the view that training is ineffective because donors fall victim to political manipulation. Donors find themselves giving scholarships and fellowships to people who are not deserving because donors do not stand up to the power brokers in developing countries. What is needed is a very sound and concrete national policy on training which the U.S. does not have. In the absence of such a policy, there is always the possibility of manipulation.

Reflecting on his experience in the U.N. and surely reflective of other organizaions, Mr. Bentil stated that major emphasis is placed on the curriculum and the job description of the experts when developing technical assistance projects. Hardly ever are any conditions provided in the technical cooperation project documents on the type of people who should be selected for training.

Another member of the audience commented on the panel presentations and discussion. Many of the ideas discussed were variables. There is the political climate. There is whether the U.S. sends a teacher or brings the student to the U.S. There is how students are selected. What is lacking is one very basic, fundamental thing: ability to describe the phenomenon. Instead, there is speculation on what influences the way that phenomenon behaves.

Attention should be given to what happens when something is transferred. People have said that everything that is transferred depends upon the culture, the political climate and everything else. However, there is not a body of knowledge to use in speculating about all of these other variables. One should begin where science begins, namely, with descriptions.

Colleagues from physical science may live at lofty heights, having built up to where they are now on the shoulders of giants because the descriptions occurred so many decades and centuries ago. However, in the social sciences and in the area of training, one is obliged to begin by describing the phenomenon: Namely, what happens when a management technique is transferred? What happens when that technique is applied? When this can be described, then, it is appropriate to begin to look at the independent variables that affect this description.

Frank Method added his comments about "brain drain." There is controversy as to what the fact and figures are and what the trends are for the "brain drain" from the third world countries to U.S., Europe and elsewhere. One suggestion that was made was to look more at past national cooperation, reversing the "brain drain" and other cooperation of various kinds. Even less is known about such cooperation than is known about the movement of people from these countries to the U.S. and to Europe. There has been a lot of speculation about the topic. Most articles that Mr. Method read on the subject treated it as an almost unmitigated good. This is a very important area for research.

There are practical problems related to what use this is to the third-world countries. There are questions of how training is valued and how the trained individual is valued. The professor drawn from a neighboring African university may be in exactly the same class as his American counterpart, but the reason that American counterpart is likely to be recruited is the assumption that that person carries with him access to that university in addition to what they can do.

Extending this concept further leads to what may be called "skills drain," which involves the movement of technicians and middle-level technical personnel among developing countries. For example, the increasing amount of construction contracting that is being done by Korean, Brazilian, Filipino and other firms has very serious implications to the ability to get these kinds of skills institutionalized within some of these countries.

The dimensions of the "skills drain" problem have grown enormously over the last decade or so, and very little is known about it. It has very important policy implications for agencies such as AID that are asking whether they should train in Country X when it is known that most of the trained people go out to neighboring countries.

Michael Moravcsik posed two questions about the implementation of recommendations resulting from the conference. First, what will happen to the recommendations coming out of these meetings? Second, is there some possibility of some mechanism by which the participants in this meeting will cooperate in some way in the implementation of what comes out of the confer .ce?

Dr. Elim responded. What will happen to the recommendations coming out of this meeting will depend upon what the recommendations are. Basically, follow-up actions will occur in stages.

The first step is to develop a research agenda, by identifying areas worthy of investigation, then by applying certain yardsticks. There are many potential research areas, but AID is not the Brookings Institution or the National Science Foundation. AID is a practical organization that recognizes the need to open new windows to be able to do its job better.

Once the research agenda on international training has been developed, AID will learn that a number of organizations are carrying out research in some of these areas. AID will encourage them and facilitate their work to the extent possible because the research can benefit AID as well as many other organizations. There may be some research areas in international training that are of great importance, but they are not being adequately addressed by another organization. In such a case, AID will fund the research or pursue that research independently or in conjunction with other organizations.

With regard to the second question, Dr. Elim expressed the hope that the conference participants would form the nucleus of a network through which AID can reach out and share, including the conference proceedings and the recommendations of future studies.

Meanwhile, many things can intervene in the next two years. The politics of international training in developing countries can also sometimes find an expression in the politics of government-sponsored research. Research in the past by this and other governments sometimes is used to validate certain policies that have been adopted before the research findings have recommended a direction. While that does happen, governments do sponsor research that is worthwhile.

Dr. Coombs responded to a question about whether or not findings from the conference could overcome the political dynamics of how various organizations like ILO, UNESCO, and the World Bank train so that they are understood, accepted and not seen as threatening. Dr. Coombs noted that it would be worse to have all the professionals agree on one training model than to have the present competition among organizations using different training models. Competitiveness and experimentation in different directions is not a bad idea.

Based on review of many different countries that have received different training models cutting across health, small industry, agriculture, and so forth, Dr. Coombs felt that the net effectiveness of those imported models, with notable exceptions, was quite doubtful. Some of the most effective training models are small enterprises in the informal sector of developing countries, particularly in Asia. He supported his statement by describing two events. One occured when he was in Afghanistan doing case studies about training approaches. He bumped into an ILO expert and asked him what he was doing there. The ILO expert explained he was there to advise the Afghans on how to set up some industrial skill training programs for electricians, plumbers, construction people, etc. Dr. Coombs asked him how he supposed the hotel in which they were staying ever got built? The hotel had hot and cold running water, electricity -- even air conditioning -- and they all worked reasonably well. Yet there were no visible training institutions from the outside in that country producing electricians, plumbers, etc. The ILO expert confessed that it never occurred to him how anything has happened in any of these countries without imported institutions, ILO, AID, German or whatever model. Afghanistan ended up looking like an international exhibition hall of skill training models from all over the world, including Russia.

Dr. Coombs concluded that competition should not be the cause for concern. What is of concern is why so many of these models have essentially failed. Be even more concerned about looking at the models that for generations have been working in developing countries in producing usable skills. Those working models represent a good area for research.

The second event occurred when Dr. Coombs was sitting at a river "restaurant" in Thailand with the director of technical training of the country watching some boats go by. Dr. Coombs had visited Thailand a number of times over a period of 20 years. The first time he was there, they were poling freight boats up and down the river. Later on, they were using imported outboard motors. This time, larger boats were whisking by at great speeds with long fantailed diesel engines on them.

Dr. Coombs asked the director of training who trains the people who run these boats and who maintains and repairs the engines? The training director said he had never though about that, all he could tell Dr. Coombs was that the training schools in Thailand didn't teach the people those skills. Furthermore, Dr. Coombs noted that whole fleets of those boats were owned by wealthy women who were good managers. He didn't know how they got that way. The women don't let anybody touch one of their boats unless he demonstrates that he knows how to run them and maintain them. He didn't have the faintest idea about how those men got those skills.

Dr. Coombs urged looking into how such individuals have learned their skills. In India, look at how a western-built automobile has a life span four to five times as long as the same automobile here. Look at who takes care of those automobiles and keeps them rolling. It is little back shops run by usually illiterate mechnics with two or three young people who may know how to read, which is helpful to the boss. They stay open all night. They improvise spare parts because they don't have spare parts. They don't run as long before they need fixing again, but the versatility of skills of those mechanics is much greater than the versatility of skills of the students coming out of training schools. There is a goldmine of guidance that can be gained by looking at how skills are really developed in these countries.

Panel Presentation

Topic: "The Training Experience: Lessons Learned and New Directions"
Chair: Alfred Bisset, LAC/DR-AID
Reports by Selected Organizations:
Stephen Heyneman, World Bank
Stephen Moseley, Academy for Educational Development
David Smock, Institute of International Education
John Reichard, National Association for Foreign Students Affairs
Heather Monroe, African American Institute
Paul Shapiro, U.S. Information Agency

Alfred Bisset noted that AID has been involved in participant training for 20 years and has enacted major training programs in three of AID's largest countries, Brazil, India, and Egypt. Panel members focused on training and/or research as seen by five different organizations which are involved in selection and the training processes for AID, the World Bank, and others.

Stephen Heyneman described the contents of three resource documents he brought to the conference. One was a list of World Bank research publications over the last ten years. The second was a small brochure about education and training projects, how they are appraised, where they are located, and their tendencies in terms of financing. A third was the World Bank's most recent education sector policy paper, which lays out the various issues in the relationship between human capital and economic development and identifies how the World Bank intends to go about overcoming some of its handicaps to addressing human capital problems.

Mr. Heyneman explained that the Bank is a large lending institution, with basically two categories of countries as its clients: what are called IDRD countries, which borrow at a current rate of 11 or 12 percent, and what are called IDA countries, which borrow at a far lesser rate, a concessional rate.

Last year education and training was about 7.2 percent of overall Bank lending, which in 1982 dollars is just under $1 billion a year. This is on the increase in constant terms. It is not on the increase in proportional terms, but that may change in the future due to a higher demand for educational lending. Seventy-five

percent of education and training lending is through education projects. About 25 percent is through non-education projects that concentrate on training. For example, an agriculture project or a transportation project may have a training component. Training components in non-education projects currently account for $200 million to $250 million a year in lending.

There are four mechanisms by which the World Bank goes about researching the problems having to do with education and human capital issues. One is the Bank's own Research Committee, a committee staffed basically by economists from all parts of the Bank. The Committee entertains proposals which can be written from any section of the Bank.

Of the Committee's budget of about $3 million a year, 8 or 9 percent, or about a half-million dollars, has been focused on education and training issues in each of the last few years. The amount of monies allocated to various areas is a function of the number of quality proposals that are presented to them.

The second mechanism involves the consultant and research budgets which are allocated to each department. Among others, there is an Education Department that includes three units. There is a project-related training unit, what is called an education unit, and a research unit. All three units have some access to consultant monies for the purposes of research. Compared to lending, the monies are quite small, perhaps on the order of $100,000 per year. Departmental units may undertake short-term research that deals only infrequently with primary source data and most frequently with existing literature, including literature summaries.

A third mechanism by which the Bank goes about doing research or assisting research has to do with research components in its lending. Currently in education and training projects, there are about $25 million worth of these specific project-related studies. They are spread out across the world where (a) there is a demand for those studies and they are affordable, and (b) where there are already sufficient levels of technical skills and kinds of experience to perform them. Thus, such studies tend to be concentrated in those countries which are more interested and have the resources.

A fourth way by which the Bank generates research is to lend monies for research institutions. This is done in those instances where priorities for research producing institutions have cropped up in the country's economic priorities. The Bank has made loans for development of universities and for specific research institutions, both within universities and outside of universities. Such research institutions may focus on tests and standard measurements, aeronautics, engineering, fish processing, and a fairly wide range of skills and issues in the research field.

In addition, research monies have been recently provided by the Bank not from its lending activities but from its own administrative budget to support research in the area called "catalytic mechanisms." These are important research topics where there is sufficient technology that can be brought to bear, where no single institution has sufficient funds to generate the necessary resources to do good research, and where a change in either technology or a research breakthrough appears to be a likely possibility. For example, the Bank has generated research in the field of agriculture through the CTIAR system, and in the health field through the psoriasis programs and the health training programs. Research funds taken out of the Bank's administrative budget are grants, not loans. The research is focused on very specific problems. The Bank is currently thinking of such a mechanism in the field of education and training. As a draft idea, it is called IFER, the International Fund for Educaional Research in developing countries. Its purpose is to build catalytic resources for education and training.

Mr. Heyneman discussed two issues in the training field. The first issue concerns the degree to which basic education in the primary and secondary schools is generating skills of sufficient quantity and quality to justify specific skilled training.

Very frequently, the quality of basic education in manpower forecasting has been ignored by the Bank. The Bank has suffered and countries that have borrowed from the Bank have suffered. Because the requisite candidates with the sufficient skills in math and science have not been generated from the secondary schools, engineering schools are empty by one third or more. The Bank has had to finance very inefficient and very expensive remedial programs in specific skill training

institutions, because students didn't have calculus or they didn't have the kinds of general skills that are expected from primary and secondary schools.

The second issue is the Bank is continually plagued with a lack of information about the quality of its own training programs. While the Bank lends $200 million to $250 million a year in this area, it has very little to announce about the productivity of this kind of training, the amount of skills that are learned, the cost of those skills, and the kinds of equipment that are most useful in generating those skills. This area is currently in fashion because of very short-term interest on the part of highly capital-intensive sectors such as transportation and electricity. From a research perspective, the Bank's basic question has to do with whether their short-term interests are going to be gained by establishing training programs without either adequate prerequisite basic skills or necessary and sufficient attention to their quality.

Stephen Moseley indicated that the Academy for Educational Development is a small private nonprofit organization with great interest in the conference because, almost daily, the Academy is faced with questions of how to implement projects, taking into account what has been learned. Basically, the Academy is an implementation service assistance organization. It works somewhere in that interstices between AID and the developing countries in many instances, and many times with World Bank funds. As a U.S.-based organization working in technology transfer programs, the Academy looks at the experience of U.S. professionals and colleagues in transferring technology in many developing countries so that technology can better be applied in another developing country.

Often, success of the Academy's work with a developing institution is both long and short range. Training success is not just judged in terms of the long-range institutional development but in short-range terms of what happened five years after the project started when the formal evaluation of the funding investment is undertaken.

The Academy tries to take practical steps to implement a project. Research can give the Academy practical ideas on how to change its implementation of projects. Experience gained by the Academy in the last 30 years is applied in the design of new projects to address the issues of: "brain drain," relevance of

curriculum, institutionalization of programs, and the ability of the developing institution to reach out to a majority of the population.

The Academy tries to build cultural sensitivity into each of its projects. More and more, the Academy and other organizations encourage the participation of the developing country nationals to work in other countries, as well as their own country. Perhaps, the Academy borrows "brain drains" in that process.

Mr. Moseley described two current programs in which the Academy is involved where training is a major component. Such programs may offer laboratories for training research.

The Academy is working to develop an agricultural university in Sri Lanka using some innovative techniques. The project is half-way or three-quarters of the way through a seven-year investment by AID and the Government of Sri Lanka. Mr. Moseley expressed the hope that someone would develop an evaluation or research approach which will look at the innovations the Academy tried to introduce.

One innovation is meant to ensure that technical assistance is tied to the training requirements. The Academy has had many bad experiences with short-term technical assistance providers who have limited familiarity with the developing country. Similarly, trainees coming to the U.S. are often trained by people who have relatively little experience or knowledge of the context or the climate of the home country.

Early in the project, short-range technical assistance experience in the developing country was provided to trainers. These trainers were then involved in masters and PhD programs for students from that country at land grant institutions in the U.S. The technical assistance experience in-country was meant to foster a symbiotic relationship between technical assistance and training. Later, those same individuals may serve in other technical assistance capacities and be expected to be more effective technical advisors.

All research for graduate level work is conducted in Sri Lanka. While not a new idea, it is hard to implement. The Academy has not found ways in which the U.S. university community can facilitate research in the home country. There are many

questions of quality, status and other constraints which mitigate against effective use of in-country research tied to a PhD program. While research in the home country has certain added costs, the Academy hopes that the benefits outweigh the costs.

Finally, in the Sri Lanka case the Academy worked hard to tie procurement to training and to tie the institutional requirements to that training. No one comes to the U.S. or goes elsewhere for training who is not already clearly a designated faculty member of the institution being assisted, so that the trainee has some sense of the work and job context for which he is being trained. This approach mitigates against "brain drain" problems, at least for the short run. Whether it will be true in the long run is hard to say.

In Indonesia, the Academy is assisting an institution to become an implementing agency, not a training institution. The work involves the development of a national center for educational technology and software applications using radio, film and television. In Indonesia, this is very relevant and applicable technology.

The project involves working with the University of Southern California which has begun to take its graduate level training overseas, not as an intact unit, but in bits and pieces. The "bits and pieces" approach may be welcome. Courses and programs which would be culturally inappropriate need not be included.

The University of Southern California is working with the Academy to integrate and develop a graduate program in Indonesia. The degree is actually offered by an Indonesian institution, but it carries with it the same credit standard that USC uses when it provides only selected courses in the technological areas that the trainees require. The Indonesian institution continues to support and provide its social, cultural, historical and other basic courses which make up the total program.

In attempting to help develop the long-range institutional capability of the national center in the Ministry of Education, the Academy did not want to work only with that institution. It was concerned that if the training programs were only tied to those personnel who are directly involved in the center, there would be no lasting cadre of personnel to fill those roles.

Some people have suggested a 5 or 6 to 1 ratio is necessary to have lasting training impact. Thus, the training program is tied to an indigenous training institution which will be responsible on an ongoing basis for training those personnel who will run the national operational center in the Ministry. This should avoid the problems of specific training for individuals in particular jobs.

This project is an attempt to combine on-the-job training with an academic degree program. It includes a kind of fail safe backup so the institution within the country can carry the program forward. This and other innovative projects should be researched and evaluated to see if they are on the right track. Such work may come out of AID's renewed interest expressed by holding the conference.

David Smock provided a brief description of the Institute of International Education (IIE). IIE is basically an operating organization, founded in 1919. At any one time, IIE supervises an average of 5,000 students in the U.S. IIE also works with American students studying abroad and is increasingly assisting American professors to go abroad to teach in developing country universities.

Mr. Smock then focused on research in IIE. Up until about 18 months ago, the IIE research program consisted of the annual foreign student census that gives rise to the publication "Open Doors," and more recently a companion publication called "Profiles." The latter publication identifies, for example, how many Nigerian agricultural economists there are in 1981 at institution X, and presents trends over time of the numbers of students studying in particular fields and from particular countries.

In September 1981, IIE developed a research agenda which goes well beyond this descriptive census work. IIE identified three principal issues of interest. One issue focuses on the impact on students of studying in another country, particularly the U.S. The second issue concerns how the foreign students impinge upon the institutions where they are studying. Third is foreign students in the U.S. in relation to national interests of both the U.S. and the sending countries.

Mr. Smock discussed concepts and described some of the topics and projects under each of the three general categories. First, to determine student impact, IIE's interest is in building evaluation components into its various projects. IIE

chose a private ten-year old program that involved 500 students: 250 Americans went abroad and 250 foreign students came to the U.S. IIE is now conducting a retrospective evaluation of this effort. It involves looking at student adjustment; professional advancement of the student while in the U.S. and after returning home, student assessment of the value of their U.S. study, student view of American life, continuing contacts with Americans in U.S. institutions, student advice to improve the program, and student assessment of foreign study versus study at home.

A second project is in the planning stage. It will involve a study of the process by which self-sponsored students decide to study in the U.S. and decide on a training institution.

A third study is one that IIE did not devise, but is financing. The study by Hans Weiler at Stanford is on the relevance of U.S. study opportunities for various foreign students. It involves interviewing both foreign students and faculty members to determine the relevance of the education the students are receiving in terms of the needs of their home countries.

The second general category is institutional implications. IIE is very concerned about the possibility of American institutions and state legislatures imposing discriminatory tuition fees or admission quotas on foreign students. To ascertain current policy on this topic, IIE is replicating a study it did about 18 months ago of all public colleges and universities in the U.S. Results from this second study should be available within a few months. There are already returns from 800 institutions.

The second area of study in this category is one that IIE considers very important; that is, looking at the economic costs and benefits of foreign students at American universities. The British have adopted what they call the "full cost fee program," arguing that foreign students have been subsidized in the past by the British taxpayers and that foreign students should pay their full share of the costs. IIE thought it would be very useful for institutions to make a better assessment of the marginal costs of having various foreign students on their campuses, and how these costs vary by type of institution, location, and field of study. In the next two or three weeks, IIE plans to begin case studies

of three or four institutions to work out a methodology which other institutions could utilize themselves to make these kinds of calculations.

In this project, as in others, IIE does not have the internal competence to do the research. IIE identifies the problems, prepares research designs, identifies researchers to serve as project directors, and then looks for monies for the projects.

Also in this project, as in others, IIE is guided by a research advisory committee. A specific group may be drawn together to advise IIE on a particular project, which was the case in a study on engineering education. Engineering is a field where 50 percent of the graduate students are foreigners and a growing number of engineering faculty members are foreigners.

There is considerable concern in schools of engineering about what they call the loss of the experimental approach and the emphasis upon theoretical research and training because of the large numbers of foreign students and foreign faculty members. The study will assess what the impact has been of the growing number of foreign students and the foreign faculty members on engineering education in selected institutions.

A third major category is the study of policymaking with regard to national and institutional interests. Results of a study called "Policy-making on Foreign Students in a Plural Society" will soon be published. This was a study done by Crawford Goodwin, the Dean of the Graduate School at Duke, and Michael Knox from the Kennedy School at Harvard. They interviewed deans, professors, presidents, members of state legislatures, and people in the governors' offices of three states -- California, Ohio and Florida -- to determine the value of foreign students in the institutions of those states, the number of foreign student respondents they thought ought to be there, policy changes contemplated, and an ideal mix in terms of foreign and domestic students. The main conclusion was that respondents had very different notions. There were very little data to go on, and there were very few policies developed on institutions. The authors suggest a very rich agenda for future research.

Mr. Smock mentioned two other studies, one recently completed and another under way. One looks at foreign students studying agriculture in the U.S. to determine the extent to which U.S. opportunities are meeting the needs of various foreign countries and to identify ways U.S. training can be made more appropriate in the field of agriculture for foreign students. A statistical study done at the startup of this project has been expanded.

Finally, just published last week was a study describing education of Black South Africans in South Africa and current trends in educational opportunities for Blacks in South Africa. Mr. Smock hoped to do similar assessments in other countries.

John Reichard announced that he brought copies of papers presenting research ideas developed by staff in the National Association for Foreign Students Affairs (NAFSA) in recent years. He described NAFSA as a professional membership organization of institutions and individuals engaged in international educational exchange. The membership has doubled in the last three years, which is reflective of the growth in the foreign student population in the U.S. and the increasing institutional concern and awareness of foreign students.

As the Goodwin-Knox study points out, many institutions are beginning to realize that they ought to be thinking about foreign students because some things have not worked out as well as forecast when foreign students were admitted. Much movement into American universities has been very haphazard. That doesn't mean that there haven't been some good results, but some things have happened that have caused institutions to take another look.

NAFSA is focused very heavily on the process and the administration of exchanges, admissions of students, English as a second language, academic and personal counseling, enrichment activities in the community and, increasingly, study abroad by American students.

NAFSA has had a great interest in students from developing countries. That interest is intensifying because two-thirds of the foreign students now studying in the United States are from developing countries, and they are studying heavily in the fields that directly relate to technology transfer and development.

Concerns NAFSA has had in working with AID and with others have sometimes resulted in research commissioned by NAFSA. The Association is interested in a variety of topics, including the effects of community experiences on students. NAFSA is also very interested in the relevance of education. Foreign student advisors and directors of international offices relate that students tell them that required courses are not the right courses and are not useful to them.

The re-entry process is another area of interest to NAFSA. The Association developed a variety of ways to encourage students to return, including job placement, re-entry seminars, and literature. The Association has also become very involved with management skills through publications and meetings on the topic.

Practical training is another area of emphasis. A major request by students from developing countries is experience in American industry and organization. To facilitate practical training, NAFSA has been working with Immigration to encourage modification of the Immigration regulations so that students can have practical training in the midst of their academic work rather than after getting their degree. The new Immigration rule coming out in April may liberalize requirements in this area.

Technology transfer is also of concern. This has resulted in a lot of collaboration with other organizations since those who do the administrative work must connect with those who have academic responsibilities in the institutions.

With AID's major support, NAFSA commissioned a study by Motoko Lee at Iowa State University on the needs of foreign students from developing countries. NAFSA has run special projects on practical training to develop principles that industry could use to provide useful training to foreign students rather than have them learn what Americans do on their coffee breaks. In conjunction with some science organizations, NAFSA had a seminar last year. The report given by Michael Moravcsik on technology transfer is about to come out.

The result of these meetings, consultations and discussions is the desire of people who work in this field to have longer views of what is happening. While long-range studies are difficult for government agencies and others to support

because of multi-year funding requirements, there are still some people now taking these longer looks. Long-range studies should be encouraged because if there is some truth in what Professor Price and others have said, this has serious implications for the whole infrastructure of international education. To get a longer range perspective, NAFSA hopes that data bases at colleges and universities can be used to identify who has gone through their programs and where they have gone.

NAFSA is especially interested in any research that provides guidance on who should be placed, at what level, in what programs, and how personal problems may keep students from meeting their training objectives. Recently, it has been suggested that the personal problems of students studying in the United States were largely met through campus and community organizations, better information, and better understanding of the United States and its people. However, it seems that the U.S. is doing less of a job than it was doing 15 or 20 years ago because there are not as many formal programs to help students meet members of the community and see other parts of the United States. The assumption is that foreign students will somehow be able to do these things on their own. Despite AID Christmas seminars, American students seem to isolate foreign students. One recent study at the University of Minnesota showed that American students were far less interested and sympathetic toward foreign students today than they were 15 or 20 years ago.

NAFSA is also interested in the fact that there are about 200,000 foreign students in America from so-called "developing countries" who are not sponsored by the U.S. Government and are in fields where they might assist in development. Mr. Reichard asked whether the U.S. is losing a great opportunity to work with a number of these people who could be very pivotal in the whole development process. Many who have worked with foreign students over the years know many people who came to the U.S. on their own and are back doing very important things in their government or in academic life. It might be worth looking at who these people are. Foreign student advisors on campus say there is often no difference between students who are sponsored and those not sponsored. They meet in clubs together. They do things together. They frequently live together. This is something else that might be looked at.

Earlier, David Smock noted another area of interest. The area involves public policy issues that are now beginning to develop in the U.S. and their implications for international training and international education. Mr. Reichard spent a good part of the previous week meeting with people on Capitol Hill concerning the anticipated reintroduction of the Simpson-Mazoli Act. Some thought that a very good case could be built to get the provisions concerning the return of foreign students for two years to their home country and the provisions involving the hiring of faculty for American campuses and for American high tech activities.

But, surprisingly, there is a political issue, one that did not surface during the crisis involving the Fulbright program a year ago. Political pressures exerted by constituents have led politicians to say such things as: "Half the foreign students who come to the United States stay here." When politicans are told there are no reliable data on that subject, politicans respond as everybody knows they do; "just look at the cab drivers in Washington."

When Mazoli and Simpson were on national radio the previous week, every other question from the listening audience was about foreign students. Callers made such comments as: foreign students all stay here, foreign students are keeping my children from going to college, foreign students are taking the jobs away from Americans, and foreign students demonstrate while they are here and are ungrateful.

These events suggest that there will be a critical look at international training in the next years. Research will be important to describe positive results from the exchange programs, especially those involving AID participants, since there is a lack of sympathy for anything that has the name "foreign aid" connected to it.

Heather Monroe indicated that the African-American Institute (AAI) has been involved with participant training for over 20 years. The majority of the participants have gone home and, for the most part, have been gainfully employed doing relevant things. This perspective is not based on research, but on field observations and communications with former participants.

From the same sources, AAI has learned, as others have, that the graduate students who are already tied into their home countries with families and promises of jobs will go home whereas the undergraduates may stay here. Furthermore, it seems that graduate training programs are more relevant if the thesis can be tied into development projects or problems that will be relevant to the students' careers.

In 1983, AAI has an opportunity to seriously study one of its major scholarship programs, the AFGRAD Program. Begun in 1963, the program is in its 20th year. The study is called "Operation Search." It will be more detailed than an earlier "operation search" that was done just to find out what AFGRAD alumni were doing in 1975.

For the current study, Dr. Jasperdeen Kobes developed a questionnaire which is being sent out to some 1500 AFGRAD alumni. The study will also try to quantify the data in the student files in terms of who these people were when they applied to AFGRAD, what they were expected to do and what they hoped to do with their lives. Information from the student files will be compared with the results from the questionnaire. Dr. Kobes will visit Tanzania, Zambia, Cameroon, Mali, and Sierre Leone to interview a cross-section of AFGRAD alumni and to talk with others such as government officials and supervisors of AFGRAD alumni who are directly or indirectly related to the AFGRAD Program.

AAI hopes that this project will demonstrate some of the things AAI has been saying all along. For example, AAI believes that some AFGRAD alumni have moved up the ladder and are in policymaking positions. Dr. Kobes will look at career patterns of AFGRAD alumni and will assess their attitudes toward both their home situations and their graduate studies in the U.S. Issues of reentry, job acquisition and readjustment will be addressed. Dr. Kobes will also look at the extent to which alumni maintain ties with the U.S., are members of professional societies, receive journals and go to meetings. The lack of such things may make their training less relevant or less useful in the long run because they do not keep current in their field.

Paul Shapiro stated that the United States Information Agency's (USIA) programs over the last year or so have been drawn increasingly from technology and science

education. USIA chairs a presidential advisory panel on international educational exchange. The panel has a two-year mandate, and at the end is supposed to make recommendations for national policy. Not only is there a lack of national policy in recipient countries, but there is a lack of national policy in the United States as well.

A conference was held in late 1980 at the Woodrow Wilson Center to discuss the development of the Fulbright program and plans for the 1980s. Three trends became evident at that meeting. The first was the geographic dispersion of the Fulbright program. The program that began in the late 1940s with approximately 20 participant countries now involves 120 participant countries. This is the case despite the fact that monies for the program have substantially decreased from 1960 dollars to 1982 dollars.

The second trend was subject dispersion including entry into the fields of science and technology. This is really an outgrowth of the first development. As more developing countries became participants, more countries identified needs in science and technology. The effect is that this year 33 percent of all the participants in the Fulbright program are in the area of natural sciences. Nearly all of this group involves foreign participants, very few are Americans traveling abroad for study and research in the natural sciences.

The third basic development was a trend towards nonmutuality. The goal of Fulbright program, according to the legislation, is "increasing mutual understanding between the people of the United States and the people of other countries," by Americans traveling abroad and foreigners coming to the U.S. to study. Over the last 20 years, there has been movement away from 50 percent of foreigners coming to the U.S. and 50 percent of Americans going abroad to about 70 percent of foreigners and 30 percent Americans.

Given these trends, the USIA is considering policy research in several areas. The first area involves the study of effects of the geographic pullback. It is difficult to determine which are the "key" countries and whether the individuals being helped will make the best use of the help. From this premise, USIA is offering funds on a region-by-region basis to allow recipient countries to compete for available resources. This approach should prompt countries to clearly define what they need.

A second area involved is the development of the thematic foci for large chunks of Fulbright money to maintain some control over the subject areas in which programs or resources are developed. This may mean that very limited resources would be earmarked for physicists who never set foot out of the physics labs and more resources would be devoted to developing U.S. competence in international affairs and political affairs.

A third area concerned an expanded role for USIA's exchange coordination office. A mandate in the legislation states that USIA is supposed to serve as an information clearinghouse for other government agencies to allow them to understand what the others are doing, and to better formulate their own programs. It is surprising how little agencies know about their colleagues next door.

A fourth area of inquiry is cost-sharing among participants in the Fulbright program. There are now 25 countries, including some developing countries that, taken together, carry 50 percent of the cost burden of the Fulbright exchanges. Their monetary contributions illustrate the importance that these countries accord the program.

Another trend is reflected in the Humphrey Fellowship Program initiated three years ago that involves bringing people who are firmly rooted in their own societies to the U.S. for training that is not necessarily degree-related. This program brings career administrators to the United States to view the way our cities, our factories, etc., are run.

Still another recent development involves selecting mid-career people, who are not looking for degrees, to teach in secondary schools abroad and to become involved in youth exchanges with developed countries. Such youth exchanges are now in place with Western European countries and Japan, largely supported by the private sector.

These are some of the issues being discussed now in USIA. One area of overlap between AID and other organizations with USIA is public administration and management. The USIA effort is likely to focus on the social and political aspects rather than the economic results of training in those two areas.

Group Discussion

In response to the question of how the interests of a country can be determined, Mr. Shapiro explained that, to a great extent, what is in the interest of the recipient country is what is in the long-term interest of the United States. This concept is included in the legislation of most agencies represented at the conference. Who wrote the legislation and who is paying for the programs must also be recognized, and that is fair.

A member of the audience focused on institutional development and how training affects the processes of the institution and the institution itself over time. On that subject, Mr. Moseley noted that for both of the examples he cited earlier, it would be impossible to evaluate the results of training individuals at the PhD or Masters levels, but it would be appropriate to evaluate the progress of the institution. Both approaches aimed at institutional development by ensuring that the training is more relevant to the institution, ensuring that the individual does not leave his institution for very long, and ensuring that there is a good mix of skills training. This is quite different from standard participant training which is done in a project context.

Commenting on the same topic, Mr. Smock agreed that it was very important to make those kinds of assessments. He noted that there was an evaluation of assistance given by Cornell on institutional development of the University of the Philippines.

Mr. Smock cautioned that the role of training in institution building should not be narrowly construed. A project should not be judged a failure because trained individuals did not return to the targeted institution, but went to other institutions in the country.

Mary Ann Cusack asked whether there was a viable model that could be used to identify training needs 5 to 10 years in advance. When Mr. Shapiro indicated there was none that could be used broadly, she asked whether such a model was needed. Mr. Shapiro then noted that the development of such a model should be a goal while working in a developing country.

Mr. Moseley added that a great deal of attention is given to manpower requirements, but no one ever gets around to manpower training requirements. A member of the audience added that manpower planning is implicit in every university that has been designed. There have been many manpower planning studies and there ought to be more, imperfect as the technology may be.

Asked about the number of individuals supported by the Fulbright program and the AID participant training programs, Mr. Shapiro noted that of about 5400 participants in the Fulbright program, about 3,800 were foreigners studying in the U.S., whereas Dona Wolf noted that there are about 11-12,000 AID-supported participants in the U.S. at any given time, counting academic and short-term participants. In addition, Mr. Shapiro estimated the size of the Fulbright program last year at 78 million dollars.

Another member of the audience noted that two rather important U.S. Government sources of training activities were not represented at the conference. One is the Peace Corps which has had very different experence training volunteers and training people abroad. The other is the biggest governmental component, the military. It was posited that the military was the most innovative and included the most effective trainers who often turn out to be very effective managers.

Dr. Elim responded that many attending the conference had Peace Corps experience, but the organizaion itself was not represented. The military was not invited. While it is engaged in substantial training in science and technology in areas such as manning radar equipment, AID is bound by legislation from engaging in any paramilitary or military training. On another level, AID will probably be in touch with them to find out what their research agenda is.

Dr. Price expressed concern about lumping "science" and "technology" together as if they were just different brands of the same thing. He argued that science is an extremely peculiar activity because of its universality. There is no such thing as African physics, or Spanish physics, or "underdeveloped physics." This notion must affect the training because the requirements are the same everywhere in the world. By contrast, technology is related to the social, economic, political, ideological and linguistic characteristics of the region of concern. People from developing countries tend to look to the United States for training

in science and technology, even though it may be extremely inappropriate and irrelevant that the U.S. has a very high development in them. As noted earlier, it is ludicrous for those from developing countries to go to a developed country for science training because they will deprive their own country of the infrastructure for the technology. By contrast, technological students tend to counter training received in an inappropriate social environment.

Dr. Alim agreed that there is no Nigerian chemistry versus U.S. chemistry, but pointed out that the application of chemical science in Nigeria is different than that in the United States.

A member of the audience added to a different aspect of Dr. Price's discussion. The word "technology" is equally dangerous because it also is a big umbrella word. Earlier, someone noted that it was remarkable that in automobile body shops in the back doors of the city of Madras, people keep U.S. cars going for inordinate periods of time. While that is true, one can find exactly the same thing in the byways of the small towns throughout the middle west of the United States. Such shops are overshadowed by the continuous acrylic casting process, the NASA program, and Silicon Valley.

A very important part of the technology which is not used in the training of foreign students in the U.S. is the labor-intensive small shop, the five-to-ten man operating unit. Such shops are likely to be the true backbone of the United States technological capability.

Work Group Reports and Discussion

A co-chair of each of the four work groups reported on their findings and conclusions. A brief question and answer session followed each presentation.

GROUP III: Institutionalization of Training Capabilities in LDCs

Michael Moravcsik reported for Group III. Early in the game, the group recognized that very little is known about the subject so that, in a way, it was not very difficult to make recommendations on it. In particular, available information

is, to a large extent, anecdotal from people who have been involved with the institutionalization of training of various sorts. It would be desirable to have even this kind of information more systematized.

One of the group's general recommendations regarding methodology is to emphasize case studies when doing research on this general subject. For example, it would be appropriate to do a detailed study of the history of a past project. From the viewpoint of methodology, in general, the group proposed to publicize a grant program in the area and let researchers propose how particular research would be conducted.

In addition, the group identified five particularly important subjects for research. The first research topic is to use existing resources; assess national and regional training institutions in developing countries with special regard to U.S. financed institutions. This topic actually has two parts. The first part involves a survey to identify all existing training institutions. The second part involves using a case study and critical incident approach to do a qualitative assessment of the relative success or failure of these institutions in terms of the language of instruction, curricula and other important factors which contribute to the institutions' effectiveness. Such information could be used for project designs for donors, for recipients, technicians, and the like.

The second topic deals with on-the-job-training in small enterprises. An investigation would be useful in a few selected Asian, African, and Latin American countries of existing indigenous training processes and indigenous apprenticeships going on in small enterprises, with a view toward determining whether and how such enterprises might be helped to improve their performance without destroying their informal and non-bureaucratic character. The group noted with approval that AID/ED has already initiated a limited investigation of this sort in two Latin American countries and one African country. This research would be preceded by a review of existing studies, actions, and programs in this area.

The motivation for including this area is that there is a lot of expertise and training going on in a very informal way, in very informal organizations in many of these countries. Many of these efforts are very successful, as measured by the commercial success of enterprises based on this kind of training. Research

in this area will make a very important contribution to the overall technological infrastructure of the country, but it is quite different from the processes that are usually dealt with through the ministries, international organizations, and so on.

As a third research topic, a tracer study is needed to determine the factors which contribute to the successful completion of AID participant training programs. The purpose of the research is to understand why certain AID programs were successful and why other AID programs were less successful.

The group felt very strongly about the fourth research topic, recognizing it was broad in scope. One aspect concerns determining whether young men and women who receive their education and degrees in the U.S. and return to professional or technical positions in their own countries have few opportunities to maintain their level of expertise so that in three to five years, they are likely to have fallen significantly behind their own peers to the detriment of their performance. If those originally trained in the U.S. do fall behind their peers, another aspect of the research would be concerned with developing ways AID can ameliorate the problem through continuing education.

The fifth research topic would involve quiet inquiry into the innovative training methods used by the military forces in less developed countries which are supported by the U.S. military, especially with respect to types of training that have important uses in the civilian sectors of society. In the past, military trainers have been far more industrious in learning from innovations in civilian education and training than vice versa.

In addition, the group developed a one sentence statement about each of 27 other subject areas for research. These are presented in Exhibit 1. The topics are given in terms of statements, the validity of which is to be examined by research. The formation of the statements do not necessarily represent the group's position on the particular subjects. The group believes, however, that all these topics are of considerable importance in the structuring of international education and training (E&T) in science and technology (S&T).

EXHIBIT 1

SUGGESTED RESEARCH TOPICS ON INTERNATIONAL
TRAINING IN SCIENCE AND TECHNOLOGY

1. E&T* in S&T** of students from the developing countries at American universities retards the development of indigenous educational institutions in the developing countries.

2. The selection by students from the developing countries of institutes in the United States for their E&T in S&T is at the present haphazard because of the lack of information to which they could have easy access and which would help them in the selection.

3. The presently prevalent practice of developing countries to narrowly specify the field of study of students sent abroad and the use of bonds to keep them to this narrow goal is counterproductive.

4. The assessment of applicants to American graduate schools from the developing countries using the GRE examination is dysfunctional and inequitable.

5. The assessment of applicants to American graduate schools from the developing countries using oral interviewing programs like the Physics Interviewing Project or the new Chemistry Interviewing Project is substantially reliable.

6. Short-term (6 months or so) training in S&T of individuals from the developing countries in the United States may help their immediate utility at home, but contributes little to their long term potential in S&T in their own countries.

7. A knowledgeable and thorough initial professional advising of entering foreign students at American S&T departments would improve the E&T of such students considerably.

8. An S&T curriculum specially designed for foreign students while they are studying at American universities, which emphasizes scientific and technological subjects deemed "relevant" to developing countries, enhances the effectiveness of such students in S&T after they have returned to their countries.

9. An auxiliary education exposure of foreign students, while they are at American universities, to the contextual problems of doing science or technology in developing countries, enhances the effectiveness of such students in S&T after they have returned to their countries.

10. Assigning a thesis topic to a student from a developing country for his advanced degree obtained from an American university, which topic is deemed "relevant" to S&T in developing countries, enhances the effectiveness of such students in S&T after they have returned to their countries.

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*E&T = Education and Training
**S&T = Science and Technology

11. A polling of scientists and technologists in developing countries ten years after they received their advanced degrees at American institutions concerning the strengths and weaknesses of their education in view of the realities of S&T in the developing countries would reveal much that could be used to make American education offered to students from developing countries more effective.

12. The most important single factor in bringing about brain drain of S&T personnel from the developing countries is the isolation of such personnel in those countries.

13. The former Canadian program of extending opportunities to scientists and technologists who received their advanced degrees from Canadian universities to return to Canada periodically for short-term "updating" visits contributed substantially to the effectiveness and stability of the S&T manpower in the developing countries.

14. Regular opportunities for periodic short-term visits at a well-developed research institute (like the International Centre of Theoretical Physics in Trieste) extended to scientists and engineers in developing countries contributes substantially to the effectiveness and stability of the S&T manpower in the developing countries.

15. Ongoing bilateral links between small groups of scientists (one in the United States and one in a developing country), organized directly by the scientists themselves, is one of the most effective ways of assuring continued E&T for scientists and technologists in the developing countries.

16. International research institutes like the International Institute for Tropical Agriculture may do good research, but are very weak in their contribution to the E&T of the S&T manpower in the host countries.

17. The training of science administrators who have no substantial personal experience in scientific research or technological development work by sending them abroad to a formal curriculum in science policy is very ineffective.

18. Scientists and technologists in the developing countries who received their advanced degrees in the United States are, on the whole, more favorably disposed toward the United States than those who received their advanced degrees elsewhere.

19. Training technicians in the developing countries through an apprenticeship program in which such technicians work under a roving technician from the United States residing in the developing country is a highly efficient method.

20. The main obstacle to high quality E&T and S&T in the developing countries is the lack of high quality S&T manpower in those countries.

21. The traditional societal, parental, and peer pressures on a young student in a developing country is such as to discourage him from becoming a scientist, and hence special efforts are needed to counteract those pressures.

22. Special educational opportunities at all levels in S&T for unusually gifted students in the developing countries would be a valuable addition to the existing S&T infrastructure.

23. A set of case studies of the history and assessment of existing scientific and technological institutions in developing countries established through international cooperation would be very useful for the formulation of future programs. A common methodology for research and assessment should be formulated for this set, followed by separate projects to prepare each case study.

24. Using evidently successful individuals as case studies, trace their personal history, training, and achievements to derive useful hints for on-the-job training programs.

25. The successful establishment of a training institution in a developing country has certain educational and infrastructional prerequisites.

26. In countries with market economies, the training of scientific and technological manpower abroad is influenced by the differing cost of such a training in the various countries abroad, and the choice based on such cost considerations significantly affects the quantity and quality of the resulting trained manpower.

27. The necessity and the nature of reliable aptitude and interest tests for vocational manpower training in developing countries require thorough examination.

Group Discussion

As a member of the work group, Mr. Coombs elaborated on the first major research topic which involves looking at existing institutions which the U.S. helped to create, whether they be universities, vocational schools, or whatever. The purpose is not to create new institutions, but to help existing institutions perform better. Rebuilding existing institutions may involve review of curriculum, ways to train trainers more efficiently, and many other areas.

When asked whether the group identified criteria for selecting institutions, Dr. Moravcsik indicated that such criteria were not explicitly discussed. He added that criteria needed to be selected or developed in order to determine what was successful and what was not.

Dr. Price expressed some concern about the fourth major research topic identified by the work group which suggested that trainees may need "repair" in five years or so because their original training was outmoded. Dr. Price suggested that training considered outmoded in five years may either indicate no appropriate infrastructure or that the training had been inappropriate in the first place. He argued that it may be counterproductive to repair either the people or the institution if a bad choice was made in the first place.

Dr. Moravcsik responded to Dr. Price's comments. While agreeing with Dr. Price that as much education should be done locally and indigenously as possible, once faced with the fact that a large number of people did get their education in the U.S. who are back in their home countries becoming ineffective, the idea that something should be done about them can be justified. Similarly, people who have trained in their home country might also become obsolete after five years for the same reasons.

A member of the audience noted that too much emphasis may be placed on the training when basic infrastructural problems may render that training ineffective. AID may not be able to help in that respect. The responsibility seems to be with the national government.

When asked what could be done by developing country scientists in the developing countries, Dr. Moravcsik noted that a laboratory must be created as a way to expose new approaches that can be useful and may be adopted by training institutions. Without getting a consensus, the group identified an association such as the Association of African Universities as one mechanism that may provide existing institutions with exposure to new approaches.

A member of the audience added that developing country scientists who have run important institutional development work in one country could be assigned research tasks in other countries. In the process, the individual will become better at institutional development and their home countries will benefit from the research they conducted elsewhere.

Dr. Coombs pointed out that over the last ten years, ICED had done a few dozen case studies in a few dozen countries, and in almost all cases, ICED found people in those countries who had good general training, wherever they got it. Such individuals participated in the design, data collection and write-up of the case studies. As a by-product, some of these individuals used their newly acquired case study skills in other efforts in their own country.

GROUP I: Appropriateness of Science and Technology Training

As reporter for Group I, John Hurley explained that group discussion focused on issues that have to do with international training in general, and not only AID's international training. Some issues discussed either may be appropriate or of interest to AID.

The group developed 10 criteria for establishing research priorities and AID research ideas. These are presented in Exhibit 2. The research can be grouped into three clusters. One cluster is concerned with research on training and how it affects the development process. For example, one suggestion was to do some historical case studies of the training policy of countries which seem to have made advances in their science and technology sector. Japan is one conspicuous example.

EXHIBIT 2

PRIORITY SELECTION CRITERIA AND RESEARCH IDEAS IN SCIENCE AND TECHNOLOGY TRAINING

Criteria

1. Importance as a basis for other research
2. Policy relevance to AID development planners
3. Specific relevance to AID/IT policy decisions -- critique of basic assumptions
4. Contribution to understanding of fundamental underlying issues
5. Tie into to basic questions such as: Where are we? Where do we want to go? How?
6. Lack of current knowledge
7. Practicality within available resources
8. Political sensitivity
9. Basis for communication on policy and program issues
10. Potential for action research

Research Ideas

1. Development of improved training methods
2. How can AID assess utility of technical training
   - To development
   - To work of participants (review literature & develop theory)
3. Cross Cultural
   - Adjustment of Master's and PhD level scientists and technologists
   - By location of training and location of work

	Science	Technology	Management
United States			
USSR			
Great Britian			
France			

4. Summary of relevant research on social studies of science and technology (industry, military)
5. Roots of inappropriate science and technology transfer and dissatisfaction of S&T personnel, case studies of total cost to training cost by field
6. Prioritize major expenses on providng S&T infrastructure by country
7. Study modalities to encourage private donations of scientific equipment in conjunction with it (taxes)
8. Perceptions of science contrasted with technology based on content analysis of LDC literature (i.e., traditional Islamic literature) what is successful
9. Study of transitional Islamic, Hispanic, African literature as it relates to S&T
10. Training of LDC persons in science and policy studies

A second cluster of ideas is concerned with training approaches. For example, retrospective and possibly prospective case studies might be undertaken to assess the comparative efficiency of traditional degree-type training and training that involves follow-up and linkages with current information in the discipline. It might be interesting to determine the success of trainees who are selected according to a set of criteria. Training hardware or software technology research might lead to some improvement in training methodologies.

The third cluster of research ideas concerns cross-cultural issues that involve science and technology training. One suggestion was to evaluate the experience of some of the institutions that AID and other agencies have helped to establish and, in many cases, helped staff. Going beyond this, it might be interesting to compare the results of training on institutions that have been supported by different countries that have had rather different philosophies and different approaches to training.

Another suggestion in the cross-cultural category was to analyze literature content in developing countries to identify local perceptions of science as contrasted with technology. This analysis may suggest better approaches to the training process.

Finally, Mr. Hurley identified a number of worthwhile concepts that were suggested in the work group. As a general premise, it was considered useful for AID or other agencies to try some different approaches instead of some of the ones being used. One interesting suggestion, for example, is to try a vertical training approach. Thus, rather than just train the manager or the scientific leader of a team for an AID project, AID could also train some of the support people and technicians working on the same project.

Another approach would use intermittent training schedules. Rather than bring someone for training to the U.S. for a single fixed period of time, that individual might be given some short-term training, go back to work, then receive some other kind of training experience, either bringing them back to the U.S. or perhaps sending a trainer to the home country.

Other approaches would take advantage of the network of trained people. For example, people who have been trained might be used to help select new trainees, or they might serve as trainers of new trainees.

Another area of discussion had to do with the importance of returning trainees to a positive working environment. The issue of facilities or technical services cannot be ignored in the home environment. There are many examples of people who have been trained, and then go back to a situation in which they are essentially unable to do the kind of thing for which they have been trained.

In another vein, several important areas in some of the disciplines over the next decade might be identified so that training in science and technology could emphasize these areas. If the developing countries do not develop their own expertise and capability, they will not be able to take advantage of a lot of exciting things that could be applied to their agriculture or health services, or to their energy needs.

Another way of focusing resources is to concentrate training in certain countries. Countries would be selected according to a set of criteria.

Group Discussion

Dr. Elim suggested that science and technology training should relate to the perspective on science and technology of the developing country. He asked whether the work group addressed this issue.

In response, Mr. Hurley noted that the work group recognized that policies toward national development by developing countries influence the selection of trainees. John Daly, as a member of the work group, added that there was a fair amount of discussion about the need to train developing country scientists in the social studies of science so they can carry out such research themselves. Scientists and technicians should not only be trained in specific subject matter, but also in the policy formulation and the administration of activities. To effectively accomplish such training, the group felt that there is a substantive, organized body of knowledge in the social studies of science and technology which has real

import for AID, the donor community, and the developing countries themselves. This body of knowledge should be tapped in research on international training.

Mr. Moravcsik pointed out that one of his group's 27 recommendations had to do with giving third world students auxilliary education in just these problems of scientific knowledge. He added that he would be involved in a program this summer that will attempt this on a very small scale, and expressed interest in having further research and evaluation of this.

When asked about training undertaken by other donor organizations, Mr. Hurley indicated that many of the topics discussed in the work group probably go beyond what AID will be able to do. Therefore, the group hoped that other organizations could undertake research in such areas. Furthermore, AID supported activities might be carried out by other organizations. It is quite important that other organizations are involved in the research so that studies do not result in automatic substantiation of favorite concepts or approaches.

Mr. Hurley added that as the group identified potential research areas, in many cases the group noted that the research sould logically be done in the developing countries, for example, by developing country institutions.

GROUP II: The Transfer of Management Technology

Before focusing on details, Don Meals described the group's overall approach to research. It is action or operationally oriented research, rather than basic research. There are substantial opportunities for limited objective, short-term, adaptive research or "knowledge consolidation" projects that would provide results enabling AID to improve the pay-off of its investments in training, particularly in management training. Moreover, such projects should be given priority and not rejected because they appear to be small or do not fit academic or governmental standards for research. A traditional view of what constitutes legitimate research may preclude what is needed.

The group focused on the what, who and how of management training. Background concepts, research areas, benefits and approaches are presented in Exhibit 3.

By way of background for the "what" or content of management training, the group noted that the improvement of management continues to be a major contribution to development. Also, nearly all applications of management capabilities are expected to be dependent on cultural, social, political, and economic conditions. Transfer of management skills and knowledge will benefit from new insights about their applicability and relevance to the environments of the developing countries. Accordingly, the group's research priority is the identification of what management skills and knowledge are relevant and appropriate for developing countries. The expected benefit is to provide more effective management training.

EXHIBIT 3

BACKGROUND CONCEPTS, RESEARCH AREAS, BENEFITS AND APPROACHES IN MANAGEMENT TECHNOLOGY

1. What should be Included in Management Training

A. Background Concepts

- The improvement of management continues to be a major contribution to development.
- Of the many applications of management capabilities recognized, virtually all are expected to be dependent on cultural, social, political and economic conditions.
- Little is known about whether and how management practices are or should be adapted to the varied environments of the developing countries.
- The transfer of management skills and knowledge from all sources will benefit from new knowledge and insights about their applicability/ relevance to the environments of LDCs.
- Need to consider the who and how of management training as well as the what.

B. Research Area

Identify what management skills and knowledge are relevant and appropriate for developing countries.

C. Expected Benefit

Provide more effective management training.

D. Approaches

1. Extension and application of comparative management models/concepts.

2. Identify adaptations of management techniques in LDCs via followup of trained managers.

3. Identify conditions which aid and deter the transfer of management techniques to developing countries.

4. Adapt manager assessment tools (assessment centers).

5. Surveys and analyses of management training to identify useful insights on what to include and how to transfer management techniques.

2. Who Should Receive Management Training

A. Background Concepts

- There is a well recognized need to provide training for those who will assume or currently fill a management role include those with skills in science and technology.
- Trainees should include related management levels in a client organization as an explicit strategy.

B. Approach

- Identify criteria being applied to selection to provide the bases for guidance.

3. How Should Management Training Be Given

A. Background Concepts

- Rapid technological developments changing the delivery of training are providing important opportunities for improving the efficiency of the delivery of training.
- Large numbers of applications of training technology are available for adaptation.
- AID has an opportunity and obligation to search, select and adapt these materials for use in developing countries.
- Management trainees bring modes of thinking and styles of learning that may be different from teaching practices being employed.

B. Research Areas

- Encourage the description of learning styles prevalent in LDCs with a view to adapting training methods and strategies to local needs.

- Use research funds to provide the bases for guidance to the field on available resoruces and techniques.

C. Benefits

- Improve the impact of AID effort through more effective indigenous management.
- Make effective use of the available and extensive experience of trained indigenous managers.

D. Approaches

- Provide demonstrations of the cost effectiveness of adaptations of three to five training materials and delivery modes.
- Survey and report on private sector developments, training materials and delivery techniques to identify materials.

If very little is known about what in management training is relevant, useful, and appropriate, then to discover a little bit of knowledge will enhance the capability to improve management resources in the developing countries. It is upon these management resources that AID programs and indeed country development depend.

The group identified two approaches to studying management training; one labeled "top-down," and the other "bottom-up." With regard to the "top-down" approach, a participant in the group noted that comparative management studies could direct and inform inquiries into the appropriateness of various management techniques in different cultural environments of developing countries. Accordingly, the group urged that there be an extension and application of comparative management study concepts and models to management training in the developing countries.

With regard to the "bottom-up" approach, the group observed that there are perhaps a thousand managers trained in Western management techniques now managing activities in developing countries. These managers are imbedded adapters of management techniques, but they represent a resource that is not being tapped. Accordingly, one of the group's agenda items is to tap into this large number of operating managers in the developing countries who are living in the culture, transforming, neglecting, or even avoiding the management techniques they learned. These managers, who daily apply management skills and techniques, are capturing and storing information about management practices that is enormously valuable.

Reflecting on the question posed earlier about reverse transfer, Mr. Meals expressed the personal view that if management practices adapted to developing countries are transferred back to the U.S., management theory and management practice would benefit much more than by ten years of management research or case studies conducted at illustrious institutions in the U.S., such as Harvard and Stanford.

Thus, in the "bottom-up" approach, transfer of technology is a two-way process. It speaks directly to AID's mission to train managers and, as by product, it should improve Americans' grasp of what management is.

With regard to "who" should receive management training, the group agreed that there is a well-recognized need to provide training for those who will assume or are currently filling management roles, including those with skills in science and technology. Training should include individuals at related management levels, illustrating the vertical training concept that appeared in another group report. Simply, AID should identify and describe the criteria being applied in the selection of those who receive management training.

Because what should be done is known, no research program is needed. What is needed is factual information describing to the people at AID headquarters what selection practices are being used. This information could provide the basis for guidance and direction by AID headquarters that would improve the operation of the program.

With respect to "how" management training should be done, the group noted a lot of rapid technological developments that are changing the delivery of training. Also, there are a large number of applications of training technology available from industry, the military, and elsewhere. AID has an opportunity, and indeed an obligation, to search, select and adapt these materials for use in the developing countries. In this regard, AID should provide demonstrations of the cost effectiveness of adaptations of perhaps three to five of their available training materials. AID might also identify training materials and delivery techniques developed by the private sector and the military that would be applicable in the developing countries. AID could both make use of training resources that have developed elsewhere and better utilize the available and extensive experience of indigenous training managers.

Group Discussion

A member of the audience noted the completion of a study similar to the one suggested to survey training in the private sector. About 172 U.S. manufacturers of skills training material were surveyed and a handbook was prepared listing available materials.

The speaker agreed that a survey in the management area was needed. It was noted that AID has different ways of doing things that are very viable and very important for other users, but the information is not generally available. However, there is no mechanism for categorizing what is being done and accessing it.

Mr. Meals commented that the problem AID faces is no different from the one industry faces because of the wide ranging and diverse set of materials. Industry, too, will have to be selective and innovative in the materials it uses. He suggested that AID should use one of these training packages several times in a developing country, and modify and adapt the materials based on feedback. Such an approach will yield a package that has fairly long-term utility.

Howard Levitt explained that he is affilitated with the International Council on Education and Teaching and the Consortium for International Cooperation in Higher Education. He made two comments regarding the term "transfer." The first comment concerned the transfer of more than technical skills when training is done in the U.S. He illustrated his point by relating observations made by someone who received training both in the U.S. and Russia. That individual said that in both Russia and the United States, he had superb technical training: the equipment was the very best quality and the instructors were topnotch. The difference was that in the U.S., "he" was overwhelmed by the fact that this is an open society, and there is an optimism that problems can be solved. Furthermore, in the U.S., "he" was able to see management in large, complicated organizations as well as in unsophisticated ones. Thus, training in the U.S. is valuable for development, especially for a certain kind of leader.

The second comment was about "transfer" in a different context. One of the purposes of ICET is to help countries learn from each other's experience. In a similar vein, he suggested that AID organize projects to help the recipient countries learn from each other's experience in addition to learning from the U.S. Furthermore, there is a very powerful additional impetus. Such an approach would get the U.S. away from being called colonialist or imperialistic but, of course, the U.S. experience would be very important.

On that topic, Mr. Meals stated that sharing examples of management techniques adapted to the developing countries represents one type of information dissemination.

Dr. Price expressed concern about the attitude reported from Working Group II regarding "research." The work group in which he participated (Work Group III), opted for serious research that would be founded on a corpus of knowledge and would be sufficiently testable by the world community, not just by the U.S., to be applied. He expressed the opinion that more "casual" research was dangerous.

In response, Mr. Meals noted that a review in a reputable journal is recognized as a contribution to knowledge. It is a different kind of a contribution than experimentally controlled research. The work group simply wanted to recognize that there are uncontrollable factors in any management experiment. The group did make a distinct effort not to constrain itself by scientific research criteria of reproducability and publishability.

To fit the proposed research on management training into the framework of science, one has to say that science begins with description. Research in this area must begin simply.

GROUP IV: Economic Costs and Benefits of International Training

Frank Method reported that the group began by reviewing some of Dr. Psacharopoulos' recent work. (Dr. Psacharopoulos served as co-chair for the group.) Basically, Dr. Psacharopoulos used the work done about 15 or 20 years ago by Philip Foster and others to compare the economic impact of vocational secondary schooling with mostly academic secondary schooling that included a good

general grounding in math and science. He found that the math and science secondary schooling fundamentally was the better investment.

He tested this same basic syllogism at the higher education level, mainly concentrating on first degree training. He sorted training into "general preparation fields" offering a wide range of employment fields, and "specialization fields" offering a narrow range of employment fields. Specialized fields require higher unit training costs. Entry level salaries are marginally higher in specialized fields, but then salaries are relatively flat over a period of time. In the general fields, entry level salaries are lower, but career earnings will have a sharper upward curve to them.

A high percentage of the people trained in a specialized field do not, in fact, take employment in that specialized field, and wind up in a field where they are working side by side with people who have more general preparation. Those who receive specialized training wait longer for a job in their field to open up. Many give up and take the next best offer. If only those who end up working in the field of their specialized training are considered, the rates of return for some of the specialized training are disturbingly low and the rates of return for some of the general preparation are much better.

Dr. Psacharopoulous would suggest that there is a need for country-specific studies aimed at further exploration of the phenomena. Particular emphasis should be placed on identifying fields of training that have the highest social profitability. Such studies could also determine training costs, compare earning differentials among fields of employment, look at the relationship between fields of study and eventual occupation, and consider time in training and time to find a job. Rates of return, using income as the proxy of economic value, is much more appropriate for testing the costs and benefits of first degree training than it is for professional specialization at a later stage in the career where the economic value of that training cannot be completely calculated in terms of income, but would have to be captured by functional changes in the institution.

In any cost/benefit assessment, personal value positions must be clearly stated. The same objective situation can have a very different cost/benefit assessment depending on the value position and the position of responsibility. At a

minimum, the research done for project monitoring purposes should be distinguished from research such as that to assess the value of training to an individual or the value of training to the assisted institution.

Determining the costs and benefits of some aspects of international training will be very difficult. For example, professional mobility would probably have a positive value to an individual, but may have a negative value to an assisted institution if the training gave a key member of the staff the opportunity to go elsewhere. If the individual is the unit of analysis, mobility could be given a positive value because it is an indication of the person's worth in the marketplace; someone is bidding for their services. Using that same logic, one could equally assume that somebody who didn't have mobility was not valuable in the marketplace, but had value in some different way.

To illustrate this point, until relatively recently, Mr. Method noted that many of AID's evaluations concentrated on training for specific public institutions, and they treated as a loss to the system those individuals who got out of public sector employment into private sector employment. Today, AID has changed its value positions and is looking at the situation in a different way. AID would no longer conclude that the shift from public to private sector is a failure, and there is no particular reason why AID should. AID might conclude that it would suggest a flaw in the original project design and that AID did not properly assess the real value of the training. AID might also direct a criticism to the institution in that their salary structure does not represent value in the marketplace. But AID would not necessarily consider it to be evidence of training failure.

Mr. Method noted two other generalizations. The first is recognition that different kinds of analyses have both points of divergence and convergence, and that these various indices are tools with which to make judgments. Professional judgments are needed to determine what to do and to assign values to various costs and benefits.

The second generalization, related to the first, is that much of this research need not be scientific. It is important to beware of a tendency toward scientific inquiry in an attempt to get precise estimates of costs and benefits. Many of

these estimates are as much opinions and subject to judgment as they are objective measures. Where possible, use should be made of cost variables, benefit measures, and judgments as to how to assess a response with considerable awareness of all economic and non-economic factors at work.

Three viewpoints can be used to assess the cost/benefit of training: the viewpoint of the individual, the viewpoint of the sponsoring agency, and the viewpoint of the assisting institution. In terms of assessment for the sponsoring agency, such as AID, fairly conventional criteria were proposed by the group such as: did they return, were they retained? In addition, the group suggested that considerable weight be given to the influence of trainees in their institution. Evidence must be uncovered to indicate such influence. The rank of the individual in the hierarchy may be important. There is a tendency to say that if a person is important to somebody, that person is influential. However, that person might not be high ranking enough to be influential.

In terms of criteria for economic benefit to the individual, weight should be given to personal ability, the relationship between personal aspiration and success in obtaining it, study in a preferred field and the relationship between that field and the position that the individual actually obtained. Other criteria include individual satisfaction and measures of influence which can be translated into personal status such as number and type of people supervised and mobility.

With reference to costs and benefits to the institutions, much more weight should be given to the output of the institution itself, irrespective of the training and the degree of the individual, although probable linkages between institution output and the individual could be traced. Concern was voiced about the situation where individuals are trained in a field of study, they come back into well-paid positions, they perform well in those positions and have good plans in those positions, but the institution is not doing anything with them. Thus, an institution may be running very nicely, but it is not putting out anything at the other end or what it is putting out is of no value to the people who are supposed to benefit.

Some weight should also be given to the degree to which the institution has evolved over the period when the newly trained cadre is in place. It could have

unplanned benefits or it could have recognized some design flaws and the need to make some changes. Value should also be given to evidence of multiplier effects, such as extension activities, replication of the institution elsewhere, or evidence of particular services to other institutions.

It is important not to focus too much on the impact of assisted individuals on a particular institution. Instead, the view should be of all training for that institution and recognition that AID-specific training simply contributed to the package of trained personnel at that institution.

To determine costs and benefits to the institution, supervisors of the participants as well as the participants themselves should be interviewed. Interviews should also be conducted with others outside the institution.

It would be useful to select institutional models according to some criteria that are considered to be good anywhere in the world, then do internal profiles to find out how assisted institutions have fared in the real world. The institutional profile would include staffing pattern; how the institution attracted or retained its staff; how the people were trained and at what points in their career they were trained; internal incentives; support functions, et cetera. Training projects could then be designed so they are at least consistent with those institutions observed to be "good."

More research could be pursued on a number of specific topics. One is the transferability of specialized training. This would involve taking various fields of training and trying to identify the occupational spectrum to which that training may apply. There is a general suspicion that training fields are defined too narrowly and transferability of training from one field to other related fields is under-valued. A better definition of course curriculum for all specialized training is needed. If a common core should be defined for all training, then it could be argued that a common value could be assigned to that core training wherever it is found.

Research is needed to determine whether specialized trainees find occupations as managers rather than practice their scientific profession. If specialists become managers, research is needed to determine whether they are better managers than generalists, and whether the cost of training is worth it.

Better research is needed on planning models, particularly those that help to identify categories of personnel needed, rather than help to identify specific needs. There is an interesting example in Venezuela, developed by MIT, which attempts to develop categories of specialty needs across sectors by aggregating specific demands within each sector.

Another topic for research is determining the point in a career that training should be provided. There is a strong suggestion that specialized training is most cost effective when it is mid-career and in relatively short planned segments or modules. This topic relates to the question of the amount of cost that can be justified for certain kinds of training. It has been suggested that many employers, particularly when they are training key personnel at mid-career, will actually prefer to spend more for the training by training in small segments, even though that same training could be provided in one long continuous segment. Employers may feel they are less likely to lose the personnel, so they assign greater value to retention than to the amount of cost that would be justified solely on the basis of training provided. Thus, research on employer attitudes would be important.

It also was suggested that rather than using the more typical approach of more sharply focusing training, training projects may increase benefits by broadening training. To test whether benefits are increased by broadening training, research relating training to upward mobility would be important.

There is a need for a number of studies of different classes of training and different categories of training. For example, differences between self-financed and sponsored trainees could be studied in terms of patterns of job aspirations and nature of jobs to which trainees return. As a category of trainee, the costs and benefits of training for women should be separately assessed. There seems to be a number of reasons to assign different economic values to the training of women than to the training of men. Most likely, higher economic values should be assigned to the training of women due to differences in the amount of "brain drain", return rates and likelihood of retention. This has a lot of implications, particularly given that there will be long-term and short-term training in traditional subjects for sex-specific roles.

Group Discussion

John Daly noted that there is considerable potential for overlap between science and technology training and the economics of training in the area of the cost efficiency of alternative training modules, training modalities, and training technology. It seemed to many people in the work group on science and technology that when science and technology is weak, it was appropriate to invest in a laboratory, technicians, and other supports in addition to training the scientist. Investment to establish a complete working facility presents a problem in ascribing the value of that investment in terms of training of the individual.

Frank Method responded by noting the need to distinguish between the applied sciences and the universal sciences. In the hard sciences, it can be argued that economic value can be determined by assessing the value of its application. Such assessments are less valid in the non-applied sciences, as well as in highly specialized forms of applied sciences which cannot be measured unless there are lab facilities, research assistance, etc. Each takes a different analytical approach.

If the focus is on the assessment of returns on training for technicians, it can be theoreticaly argued that the value of each technician can be added incrementally to the institution. The same argument cannot be made about scientists. The whole package must be considered as input to the institution.

Dr. Price expanded on the point made by Mr. Method. He posited that if one is worried about societal and economic development, one is driven automatically to preferring the benefits of the sciences that are heavily based in experimental facilites and the like. However, it is in the applied sciences where there are very large hidden costs of providing the infrastructure for that science in terms of the hardware, the technicians, and the workshop. These costs are larger for an LDC than for a developed country. It is precisely the lack of provision of such items that makes the technology inappropriate and technology transfer ineffective.

Mr. Method added that to do such analysis would require an international organization, such as an agricultural research institution.

General Discussion

To start off the final general discussion, Jim Aanestad made some closing remarks. By the way of introduction, Jim Annestad explained that he is with the International Training Program in the Census Bureau. A small project in the Bureau's training school illustrates some of the points that have been made about "brain drain" when it comes to teaching statistics and data processing. Teaching people to be computer programmers makes them very valuable and often they are hired away. A program with Middle-East countries provides instruction in computer programming in modules. Basic training started in the native country in English gives students an introduction and organization for data processing. Such training usually involves 15 to 20 people. The best candidates from that group then are selected to come to Phase II in the Census Bureau School in the U.S., where they learn the how-to methods of data processing to become beginning programmers. Phase II is six to nine months long. Phase III is conducted back in their home country where students return to the job they left. They spend anywhere from a year to two years continuing programming in that same area. Phase IV involves return to the Bureau's school for advanced systems design.

The important part of this program is that the organization that sponsors the students feels as if it has a commitment from them. So far the organization has had about a 95 percent success rate for retaining people and making them productive. The organization has them, then, for a guaranteed period of probably four to five years, and everything relates to their specific program.

Dr. Price reacted to the nature of the program described by Mr. Aanestad. It seemed as if a foreign country is purchasing U.S. technology. There would seem to be a need for a developing country to raise its own census experts, for example, in order to not just buy an American census program wholesale, but to develop one that is consonent with their own culture and society.

Following up Dr. Price's point, Mr. Aanestad explained that, in most cases, an Arab and an American conduct the classes jointly so, in theory, the Bureau is supposed to work itself out of a job. After about the third year, the programs are jointly taught and the data processing part is now taught only by Arabs.

Dr. Price queried whether Arab instructors make a difference in the program. It seemed to him, based on the technical description of the Chinese census, that it was as near as possible a carbon copy of U.S. census practices, rather than tailored to China.

Mr. Aanestad explained that the U.S. Census Bureau was not at all involved in the Chinese census. The Bureau volunteered, but China said no. The United Nations did participate some. The Census Bureau shows each country a number of variations, and they select what they want. Thus, each country develops its own how-to based on its own needs.

Dr. Coombs also made some concluding observations. First, the conference provided an opportunity to freely visualize all kinds of brave research proposals. However, practical problems faced by AID must be recognized. These concerns include not only winnowing out suggestions, but actually getting behind some of the most important ones.

Even though there is a research idea which everybody in AID and outside advisors might agree is very important, it may get killed, not because it is not a good idea, but because it is going to take U.S. money overseas rather than keeping it at home. Members of Congress, understandably, want to see something for their districts, and if not for their districts, then at least an emphasis on keeping the money in the U.S. as much as possible. This perspective is not limited to the U.S. Any OECD country, with the possible exception of Sweden or Canada, faces the same practical, political problem.

What can be hoped for is that AID does not kill a good idea prematurely simply because it thinks it will get knocked down. Hopefully, AID will fight as hard as it can for the most fruitful, usable pieces of research. At the same time, AID has to be careful about the research advice it gets from the outside, because inevitably it has a bias depending on who is speaking.

Dr. Coombs offered a suggestion related to the whole question of data gathering and analysis within countries. It is apropos for all sectors, but it is especially acute in the field of education, both formal and non-formal. If the banking systems of the world were as ignorant about what was going on in foreign

balances as the U.S. is about what is going on in education, the financial crisis of the world would be immediately upon us.

There are a lot of facts, or alleged facts, and statistics. The UNESCO Yearbook is very thick, and it gives certain kinds of details for every country. UNESCO statisticians know the weaknesses of their statistics better than anybody. The statistics depend upon questionnaires mainly on formal education that are filled in and submitted each year by each country.

A review of gross enrollment ratios at different levels in any country seems to illustrate great progress. The primary school gross enrollment ratio in a number of African countries today is 80 percent or above, which conveys the impression to the unwary reader that they are 80 percent on the way to universal primary school. Chances are that a country with an 80 percent ratio isn't even 20 percent on the way to full primary schooling for all children.

The trouble with exaggerating progress using these statistics is that the job still to be done is underestimated. Inevitably it leads to future disillusionment when people discover that they are not really there.

The financial figures on education serves as another case in point. The figure submitted by governments is for public expenditures, and sometimes it is only national level public expenditures, not state or district or local level. Expenditures are then compared with total enrollments at a given level, including private institution enrollments. To calculate a per student cost figure means dividing apples into bananas. UNESCO doesn't know how many children complete primary or secondary school each year because the ministries either do not collect the data or, if they do, they certainly do not publish the data.

To evaluate an educational system, often the biggest industry in town, it is important to know not how many are enrolled, but how many finish. According to special studies, typically something like half of those enrolled in year one won't be there in year four. Also, a substantial number who do complete six grades, have actually spent seven or eight years doing it, with a lot of repetition.

The fundamental reason for not having the most essential basic facts in these countries is that an information system just isn't there in many countries and even where it is, it is very weak. According to special studies in India, there is gross over-reporting from the local level, partly because they will get more subsidy money based on enrollments and partly because they want to look good in the eyes of the next level up.

Furthermore, national ministeries put in guesstimates when completing their annual questionnaire. A very able Asian on Dr. Coomb's staff for a couple of years was the one who had to fill in the questionnaire. He told Dr. Coombs how he did it. The night before the questionnaire was to be mailed, the Asian got out last year's questionnaire, upped everything a bit, and off it went. To remedy the situation, a simple system should be devised that doesn't require collecting too much information. To get more reliable information, incentives are needed at the local level. Getting the margin of error down to 10 percent would be progress.

The system cannot insist, as education statisticians usually do, on the universe each time, but it must sample. The U.S. has great capacity for designing a simple, workable system fitted to local conditions that includes ways to collect data, and ways to do something with the data afterwards. Such systems would not be too expensive and would certainly have an enduring effect. It is something that the U.S. could handle and it would be welcomed.

Dr. Coombs suggested beginning on a modest scale. Bring together a few people, perhaps from Census and from some universities, to develop two or three little information models. Try them out in some countries. Such an approach would give information about local institutions not currently available.

Mr. Method made two points. First, he noted that he would send a copy of the new policy paper on education to everybody who attended the conference as soon as it was printed. One of the major changes reflected in the paper is a shift in the Agency's policy from a concentration on input variables for the six-year old who goes to school to a concentration on input variables for the 15-year old.

The second point concerns enrollment numbers versus the number who have a chance of succeeding. This problem permeates the system. Only about 20 percent of university-trained people are functioning as university-trained professionals. There is a serious under-estimate of the economic value of that 20 percent who are succeeding and functioning at that level of training. What is being found is a very weak correlation between the 80 percent enrollment and various social variables. The reason for the weak correlation is that 80 percent is impossible to justify based upon economic or social impact. University systems with 100,000 students enrolled put out a couple thousand graduates. It is limited evidence of the value of the 100,000 enrolled.

Dr. Price reflected on Dr. Coombs' comments about the problem of lack of comparability of manpower data across nations. This may be true for education, but it is not true for science and techrology. There are now five biannual issues of science indicators and there is an extremely good technique which can be used to assess accurately the scientific strength of each nation of the world, disagregated by field, and even measure the quality of the contribution from the country. Data developed using this technique have been used to comment on the failings of the UNESCO data, and even OECD data.

Dr. Price indicated that he planned to take a printout from the Institute for Scientific Information to a Pan American meeting in Costa Rica. The printout gives aggregate scientific and technological contributions for all the Latin American nations. Some people at Computer Horizons have been able to sample the data and find the source of training and the source of the research for each of the scientists and engineers. The computerized scientific information provides the data needed to evaluate, transnationally, the number of the effective people at the various levels of the various fields across science and technology.

There is even a journal that, issue by issue, is filled with research papers based on these unobtrusive indicators that turn out to be much more accurate than the census data. The journal is Scienceometrics, which is a specialist journal for research using unobtrusive, objective data of science and technology. It is a remarkable journal because it is published in Holland and edited from Hungary, the Soviet Union, and the United States. It is one of the very few

trans-cultural, or transnational, mathematical journals. It does for science and technology what Econometrics does for economics. It is now in its sixth or seventh volume. It was founded because of the failing of the census techniques to provide accurate transnational estimates of what is really happening in science and technology.

For this reason, Dr. Price insisted that science and technology training and research is on a quite different basis from economic research, management research, and all the other areas that are not blessed with highly objective, measurable quantities. Science and technology data are far superior to the national statistics which are an artifact of their funding agency.

John Daly noted that AID has been experimenting indirectly with the use of this kind of indicator for the evaluation of a research project called "Scientists and Engineers for Economic Development." The project is trying to use publication citations as an indication of productivity of overseas scientists and as an indicator of the networking effect that resulted from the transnational flow of these scientists.

Dr. Price added that there must be a least a dozen publications on measuring U.S./LDC links in science and technology by these unobtrusive indicators. Rafkin did a beautiful study of the linkage between the U.S. and the USSR by the joint scientific programs.

Mr. Method described how AID can act. He noted that it is very difficult to indicate some main ways in which AID can get some consensus as to what research is needed. AID must hope that somebody has the weight and the initiative to get their proposal in the works so that AID can do something about it.

Dr. Elim added a few closing remarks. AID approaches research in international training with modesty and humility. AID recognizes that a number of research experiments are being carried out by research centers in the United States and elsewhere. AID also recognizes that research in the different disciplines is at different stages.

Dr. Elim suggested that there is an integration among disciplines; each field impacts on another. This creates problems for multi-disciplinary research. Morevoer, effective research cannot be carried out in only one discipline.

The purpose of the workshop was to bring together diverse people to openly suggest research areas in international training. Those in AID left the conference with more questions than they came with, which validates the need to research in some areas.

There is a lot of homework to be done by AID, which will be done with the openness with which AID approached the workshop. Dr. Elim expressed the hope that AID will be able to work together with conference attendees on some of the proposals that have been put forward, but he noted that it must be recognized that the AID staff also have their own convictions and prejudices. AID just lights a candle. AID knows that it is not going to cover the waterfront or be able to satisfy all the yearnings. Those in government, too, have to live with a degree of frustration.

AID recognizes that the nature of research has long-term impact and short-term impact. There will be compromises, but the compromises should not be on principles. Hopefully, AID can and will move toward the desired objectives in two or three years' time. After some progress has been made, AID might want to reach those individuals who participated in the conference to review the status in order to move further ahead.

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APPENDICES

Appendix A: List Survey Mailings

Appendix B: Survey Questionnaire

Appendix C: List of Participants

Appendix D: Agenda

APPENDIX A
LIST OF SURVEY MAILINGS

The list of individuals and organizations that has been compiled follows:

- National Academy of Sciences
  - Rose Bannigan
  - Gus Nasmith
  - John Hurley
- United Nations Institute for Training & Research
  - Linda Zimmerman
- AID's Office of Science Advisor
  - John Daly
- American Association of Collegiate Registrars and Admissions Officers
  - Douglas Conner
- National Association for Foreign Student Affairs
  - Kevin Shieffe
  - Archer Brown
- American Language Institute at Georgetown University
  - Suzanne Peppin
- The World Bank
  - George Psacharopoulos
- Yale University
  - Derrick de Solla Price
- Academy for Educational Development
  - Steven Mosley
  - John Middleton
- AMIDEAST
  - Dorothy La Guardia
- Montreal University
  - Yakov Rabin
- University of Oregon
  - Michael Moravcsik
- Institute of International Education
  - Eleanor Barber
- African-American Institute
  - Hank Raullerson
- Census Bureau
  - Ken Bryson
- Institute for International Research
  - Victor Cieutat

- Michigan State University
  - Dean of International Studies
- International Council for Educational Development
  - Phil Coombs
- Asia Foundation
- Experiment in International Living
- National Science Foundation
- Brookings Institute
- American Council on Education
- Rockefeller Foundation
- Social Science Research Council
- Woodrow Wilson Foundation
- Educational Communications and Development, Inc.
- International Research and Exchange Board
- Dumbarton Oaks Research Center
- Pan American Development Foundation
- Society for International Development
- Overseas Development Council

APPENDIX B

SURVEY QUESTIONNAIRE

Dear Colleague:

The Agency for International Development (AID) is conducting a worldwide survey to identify research needs concerning training programs for individuals from developing countries.

We would appreciate your help in developing a set of training research priorities. Please ask the person in your organization who is most involved with training programs for individuals from developing countries to complete the questionnaire. For your convenience, a self-addressed envelope is enclosed.

Thank you for your cooperation.

BACKGROUND INFORMATION

Name: _____

Job Title: _____

Organization Name: _____

Areas of the World Where Your Organization Has been Involved in Training Programs.

Latin America/ Caribbean ☐ Africa ☐ Middle East ☐ Asia ☐

1. Within your organization, have you been involved in designing training projects for individuals from developing countries?

   Yes ☐ No ☐

   If yes, please describe the most difficult problems which you feel need research to improve overseas training for developing countries.

2. There are a number of research questions about the training of individuals from developing countries, the answers to which might be useful in improving training programs. Please indicate how important answers to the following questions would be in designing training programs?

	Very Important	Important	Not Very Important
(a) How should manpower needs assessments be designed to accurately identify training needs in developing countries?	☐	☐	☐
(b) In what ways can training programs supported by different organizations be coordinated?	☐	☐	☐
(c) Given limited resources, what should be the priorities for who should be trained (elected officials, career bureaucrats, technical specialists, entry level workers)? What criteria should be used for selecting participants?	☐	☐	☐
(d) What are the costs and benefits of home country training, third-country training, and U.S. training?	☐	☐	☐
(e) What are the costs and benefits of providing English language training at various sites (home country, regional centers, overseas, special U.S. English language centers, U.S. training institutions)?	☐	☐	☐
(f) What follow-up activities for trainees (professional memberships, newsletters, follow-on courses) are most effective in reinforcing and expanding on training content?	☐	☐	☐

	Very Important	Important	Not Very Important
(g) What procedures are most effective in assuring that training content matches training needs?	☐	☐	☐
(h) How long does it usually take between the time when training programs are designed and when the first trainees complete training?	☐	☐	☐
(i) What are the advantages and disadvantages of assessing the usefulness of training at various points in time (at the end of training, six months after training, etc.)?	☐	☐	☐
(j) What types of measures are most useful in assessing the effectiveness of training programs?	☐	☐	☐
(k) Are there training technologies or techniques (e.g., programmed instruction, use of computers) which are particularly effective with trainees from specific countries or regions?	☐	☐	☐
(l) What training opportunities for international students are available from U.S. businesses and industries?	☐	☐	☐
(m) How can the development of the private sectors of developing countries be effectively promoted through training programs?	☐	☐	☐
(n) What are the problems and constraints in the effective transfer of technology to developing countries?	☐	☐	☐
(o) How important is the development of of institutional training capability in developing countries and what are the problems? (i.e., hardware, capital, etc.)	☐	☐	☐
(p) What types of training (e.g., short-term technical, undergraduate, graduate) and content areas (e.g., public administration, agriculture, health) are associated with rapid economic development in developing countries?	☐	☐	☐

3. Please describe other areas of training research which would be useful to you in designing training projects. Such research should be concerned with training in general rather than with a specific training project.

4. Have you personally performed any training research or are you aware of any strong training research studies that have been conducted to address any of the questions posed in Item 2 or to address any of the topics which you identified in Item 3?

Yes ☐ No ☐

If yes, please describe the results of the research or provide references, and specify which question or topic is addressed by the information.

Comments:

THANK YOU.

APPENDIX C

WORKSHOP ON RESEARCH PRIORITIES IN INTERNATIONAL TRAINING

JANUARY 31 AND FEBRUARY 1, 1983

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APPENDIX D

AGENCY FOR INTERNATIONAL DEVELOPMENT

Workshop on
Research Priorities in International Training
January 31 - February 1, 1983
National Academy of Sciences
Washington, D.C.

AGENDA

January 31

9:00 - 9:30	Registration
9:30 - 9:40	Welcome: Dona Wolf S&T/IT - AID Introductory Remarks: Raga S. Elim S&T/IT - AID
9:40 - 10:00	Keynote Address - Training for Development: An International Perspective Speaker: Phillip Coombs International Council for Educational Development
10:00 - 11:00	Panel on the Role of International Training in Development: Research Issues Chair: Raga S. Elim, S&T/IT - AID Participants: Elliott Berg, University of Michigan Derek de Solla Price, Yale University Michael Bentil, International Management Consultant Robert Leestma, National Institute of Education Syed Hussein Alatas, National University of Singapore John Eriksson, S&T-AID
11:00 - 11:15	Coffee Break
11:15 - 12:00	Discussion
12:00 - 1:00	Lunch
1:00 - 3:00	Panel on The Training Experience: Lessons Learned and New Directions Chair: Alfred Bisset, LAC/DR-AID

Reports by Selected Organizations:

World Bank - Stephen Heyneman
Academy for Educational Development - Stephen Moseley
Institute of International Education - David Smock
National Association for Foreign Students Affairs - John Reichard
African American Institute - Heather Monroe
U.S. Information Agency - Paul Shapiro

3:00 - 3:15 Coffee Break

3:15 - 5:00 Meetings of Work Groups

Group I: Appropriateness of Science and Technology Training - Rm 451
Co-Chair: John Hurley, National Academy of Sciences
John Daly, SCI-AID

Group II: The Transfer of Management Technology - Rm 453

Co-Chair: Donald Meals, A.D. Little, Inc.
Dona Wolf, S&T/IT-AID

Group III: Institutionalization of Training Capabilities in LDC's - Rm 455

Co-Chair: Michael Moravcsik, University of Oregon
David Sprague, S&T/ED-AID

Group IV: Economic Costs and Benefits of International Training - Rm 454

Co-Chair: George Psacharopoulos, World Bank
Frank Method, PPC/PDPR-AID

February 1

9:00 - 9:15 Coffee

9:15 - 12:00 Continuation of Work Group Meetings

12:00 - 1:30 Lunch

1:30 - 3:30 Reports from Work Groups - Plenary Session, Room 451

Co-Chair: Robert Haupt, Development Associates, Inc.
Floyd O'Quinn, S&T/RUR-AID

3:30 - 3:45 Coffee Break

3:45 - 4:30 General Discussion

4:30 - 4:40 Closing Remarks: Raga S. Elim, S&T/IT-AID