AN ABSTRACT OF THE THESIS OF

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Title: ANALYSIS OF SELECTED FACTORS RELATING TO ACADEMIC SUCCESS, UTILIZATION OF TRAINING AND RETURN HOME OF LATIN AMERICAN STUDENTS WHO HAVE GRADUATED FROM THE CALIFORNIA STATE COLLEGE SYSTEM

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Purpose of the Study

The purposes of this study were to (1) identify the educational and socioeconomic characteristics of Latin American students who have graduated from the California State College system, (2) to identify those characteristics which significantly affect academic success, utilization of training and return home to Latin America after graduation and (3) to develop mathematical models for prediction of academic success, utilization of training and return home.

Procedures

A total of 146 students were included in the sample for this

study. These students had graduated from the California State College system in the five years prior to August 30, 1971. Socio-economic and educational characteristics were obtained through a search of college records, interviews with faculty and staff and the mailing of a questionnaire to the students included in the sample. Academic success was defined by grade point average and utilization of training was measured in percentage by the amount of college training used by a graduate in his present job.

A correlation analysis was completed to determine the relationship among the three dependent variables academic success, utilization of training and return home as well as the relationship between each of the dependent variables and the independent variables included in the study.

Stepwise multiple linear regression analyses identified those characteristics contributing most significantly to academic success and utilization of training. These analyses were also used to develop prediction equations for academic success and utilization of training.

Discriminant analyses were completed to test the null hypothesis that there was no significant difference between the returning and non-returning group of students and to construct a prediction model for return or non-return to native country.

Findings

1. The correlation analysis indicated the following:

   (a) There was no significant relationship among the three dependent variables: academic success, utilization of training and return home.

   (b) Six independent variables had a significant relationship with academic success. One, bachelor's degree, was negatively correlated while the remainder, graduate degree training, average English grade, prior college in native country, education major and scholarship financing, were positively correlated.

   (c) No independent variables were identified that had a significant relationship with the dependent variable utilization of training.

   (d) Two independent variables, contact with Latin America while training and vacations spent in Latin America were positively correlated with the dependent variable return home.

   It was emphasized that these were simple linear relationships that did not indicate causality.

2. The results of the linear regression analysis related to academic success indicated:

   (a) Nine variables were significantly related to academic success. Four of these variables had a positive relationship: average English grade, education major, "other" major (including majors

other than agriculture, business, engineering and education) and vacations spent in Latin America. Five of these variables had a negative relationship: return home, California State Polytechnic College - San Luis Obispo, California State College - Long Beach, time in the U. S. before graduation, and F visa.

(b) A prediction equation was constructed for academic success. The equation constructed included the variables: San Francisco State College, California State College - Long Beach, California, State Polytechnic College - San Luis Obispo, age, education, major and "other" major.

3. The results of the linear regression analysis related to utilization of training indicated:

(a) Twelve variables were significantly related to utilization of training. Six of these had a positive relationship: bachelor's degree, engineering major, father's occupation similar to student's field of study, contact with Latin America while training, Latin America high school training and present employment at a higher level. Six of these variables had a negative relationship: age, marriage during training, family financing and follow-up contact after graduation.

(b) A prediction equation was constructed for utilization of training. The equation constructed included the variables: Fresno State College, prior employment in field of training,

father's occupation similar and orientation program available.

4. The null hypothesis, stating that there was no significant difference between the returning and non-returning groups of students, could not be rejected on the basis of the discriminant analyses completed. Therefore a prediction model for return could not be constructed.

Analysis of Selected Factors Relating to Academic Success Utilization of Training and Return Home of Latin American Students Who Have Graduated from the California State College System

by

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ANALYSIS OF SELECTED FACTORS RELATING TO ACADEMIC SUCCESS, UTILIZATION OF TRAINING AND RETURN HOME OF LATIN AMERICAN STUDENTS WHO HAVE GRADUATED FROM THE CALIFORNIA STATE COLLEGE SYSTEM

I. INTRODUCTION

Background to the Problem

Cooperation with developing countries is more than the offering and accepting of professional assistance, but also a sensitive matter of determining capabilities and methods of the application of this assistance. As Bowles, former education director of the Ford Foundation has stated (1966:64)

> We have long since learned that money and goodwill, even when accompanied by methodology, skill, and competent men, do not of themselves make a foreign policy in the political world. It is high time we learned that they do not make a foreign policy in the educational world.

In a time of increasing financial and enrollment pressures at educational institutions it is important that a critical look be taken at the use of our educational facilities. Kenneth Holland, President of the Institute of International Education, I. I. E., indicated (I. I. E., 1970:5) that as the numbers and proportions of foreign students rise:

> The public and private organizations serving these students and scholars and the institutions which send and receive them are experiencing financial pressures which threaten seriously to impede their ability to serve these growing numbers effectively . . . it is mandatory, therefore, that agencies engaged in this field reassess their services with a view to greater efficiency and creativity . . .

In the California State College system enrollment pressures have grown without any apparent hope of an increase in student capacity in the foreseeable future. With such a situation in mind the focus on foreign student programs becomes acute and the reason for and the benefits of these programs had to be clearly indicated to justify their presence on campus.

Much pressure has been placed on foreign student offices to justify their presence, several foreign student programs have been reduced in size and foreign student tuition has been doubled. In view of the policy guidelines adopted by the Board of Trustees of the California State Colleges in September 1965, and the evaluation of the California State College Foreign Student Programs indicating that foreign student programs have been valuable to the California State Colleges, it was important that additional systematic and system-wide evaluation be undertaken to justify their continued presence (California State Colleges, 1970).

The Problem

There has been little evaluation of the success of foreign students coming from Latin America. This has been borne out by the investigations made during the course of this study as well as those made by Ruscoe (1968) who completed a study to develop

information about background, current attitude and future aspirations of Latin American students.

The purposes of this study were to (1) identify the educational and socioeconomic characteristics of Latin American students who have graduated from the California State College system, (2) to identify those characteristics which significantly affect academic success, utilization of training and return home to Latin America after graduation and (3) to develop mathematical models for prediction of academic success, utilization of training, and return home.

Importance of the Study

The need for this study was indicated by the California State College report "Foreign Student Programs - A Progress Report and Recommendations." The report (1967) stated that in California no systematic and system-wide research concerning foreign students had yet been accomplished. Specifically on follow-up this report stated that information was not available on what had happened to students who had been educated in the California State College system. This report also stated that the actual effect of a foreign student program would not be known until information was secured on the number and percent who were working in the area in which they were trained, the types of positions held, the problems encountered upon their re-entry

into their societies and their reactions to the educational and social interaction experiences they received in the United States.

Since 1969, in the State of California, the enrollment and financial pressures previously mentioned resulted in an increase in foreign student tuition from $360 to $1100 per year. The Chancellor's office formed a Task Force on Foreign Student Affairs to review the entire background of the foreign student issue and to recommend future courses of action. The initial report of this task force was made on July 29, 1970. Although this report did deal extensively with the effects of the initial tuition increase and methods to ameliorate the situation it was recognized that Foreign Student Programs had been extremely valuable to the colleges, the countries from which the students came and, most importantly, to the foreign students themselves (California State Colleges, 1970).

Several other factors indicated a need for careful evaluation of the need for foreign student programs. The financial investment that the United States had in international students was quite substantial. The following Figure 1 summarizes the trends. Thirty-seven percent of all the students covered in the census were wholly self-supporting. Only three percent of students from Latin America received support from their own governments in 1969 (I. I. E., 1970). Students from Africa and Latin America received the most U. S.

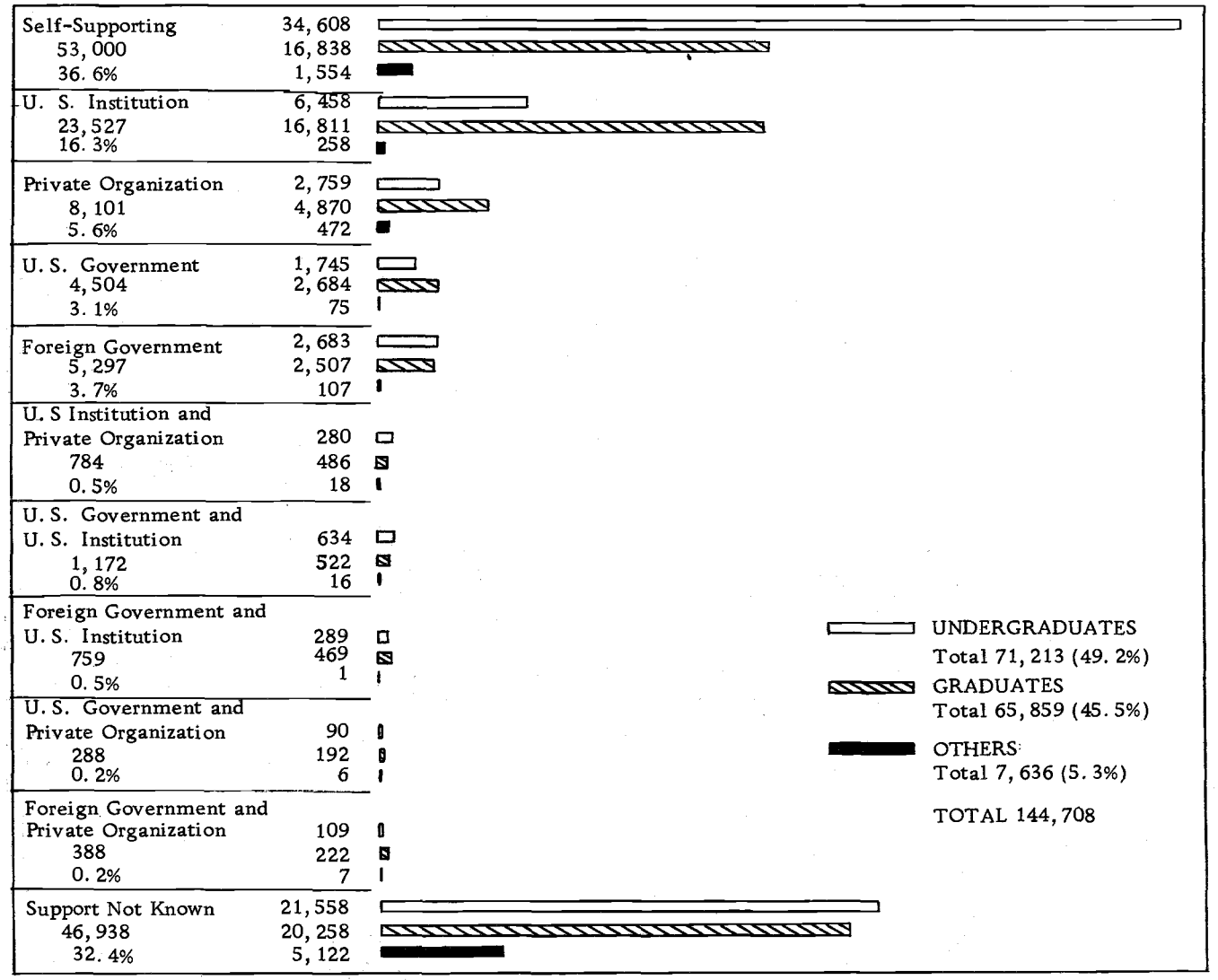

Figure 1. Sources of Support of Foreign Students, 1970-71.* * Institute of International Education, 1970

government support in proportion to their numbers, eight percent (I. I. E., 1971).

Even without this sizable investment the challenge still remained that the higher education system should provide the optimum educational experience possible for these students. Estimates made by foreign student advisors in the California State College system indicated that only 50 percent of those completing college actually returned home to their native country after graduation (California State Colleges, 1967). This percentage was often referred to as the return home rate. Any evaluation of the reasons why foreign students do not return home may assure more effective use of the foreign student dollar by helping provide a basis for developing foreign student programs that ensure training programs are relevant to both student and native country needs.

The overall importance of follow-up of foreign alumni was emphasized by a study conducted by Moore and Forman. Ninety-two percent of foreign alumni in this study favored continued contact. Their summary for the future of follow-up stated: (1964:75)

> Continuing relations with foreign alumni as a part of the alumni association's responsibility is an accepted fact. Overseas alumni are eager for follow-ups and regard it as serving their own needs and those of the American faculty members of the university and incidentially, of the United States and the world.

In answer to these needs this study provided (1) an analysis of the characteristics of Latin American students in relation to their return home, (2) a determination of the utilization of training, (3) an analysis of individual educational success, (4) the identification of significant characteristics and development of a model for prediction of the success of future Latin American students, (5) some evidence of the exact return on the financial investment, (6) a response to the indicated interest in follow-up as expressed by foreign alumni, (7) a model for the development of similar analyses for other groups of foreign students in California and in other states.

Limitations of the Study

This study was limited to an analysis of Latin American students who had graduated from six State Colleges. These colleges were:

California State Polytechnic College - San Luis Obispo

California State Polytechnic College - Pomona

Fresno State College

Long Beach State College

San Francisco State College

San Jose State College

These colleges were primarily selected on the basis of the size of the foreign student body and the organization of the foreign student office. The colleges selected included six of the seven largest foreign

student programs. The organization of the foreign student office and availability of interested and cooperative officials was also an important factor in selection. Financial problems created changes making it difficult to obtain cooperation and information at some colleges.

The limitation to Latin Americans was due to several factors: lack of follow-up on Latins and size of the Latin American study body. As shown in Figure 2 Latin Americans made up the second largest group of foreign students in the United States and in comparison to the Far Eastern group few follow-up studies had been completed.

The state of California had seventeen percent of all foreign students in 1971 making it the single largest host state in the nation (I. I. E., 1971). Figure 3 outlines the enrollment trends in the state of California. Latin America was the third largest contributor of foreign students in the state. The change from the national trends shown in Figure 2 was due to a large contingent of Iranians on two California campuses (California State Colleges, 1970).

The limitation to graduates was made due to the lack of information on those who attended California Colleges but left before graduating. It was recognized that this would have been a very useful addition to this study but previous investigations including the pilot study provided evidence that the follow-up of these individuals was very difficult and beyond the scope of this project.

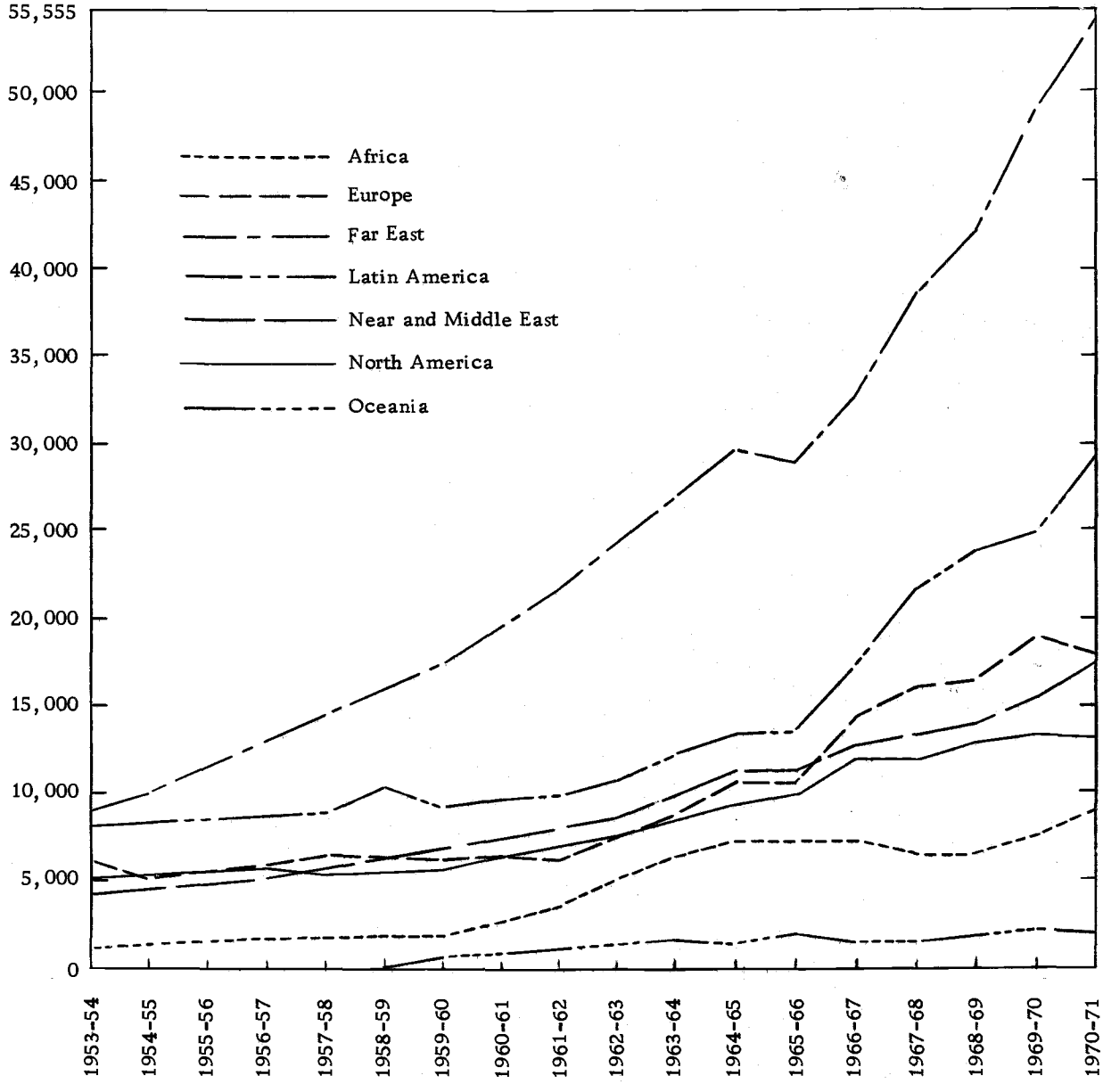

Figure 2. Foreign Students in the U. S. - 1953-1971.*

*Institute of International Education, 1971

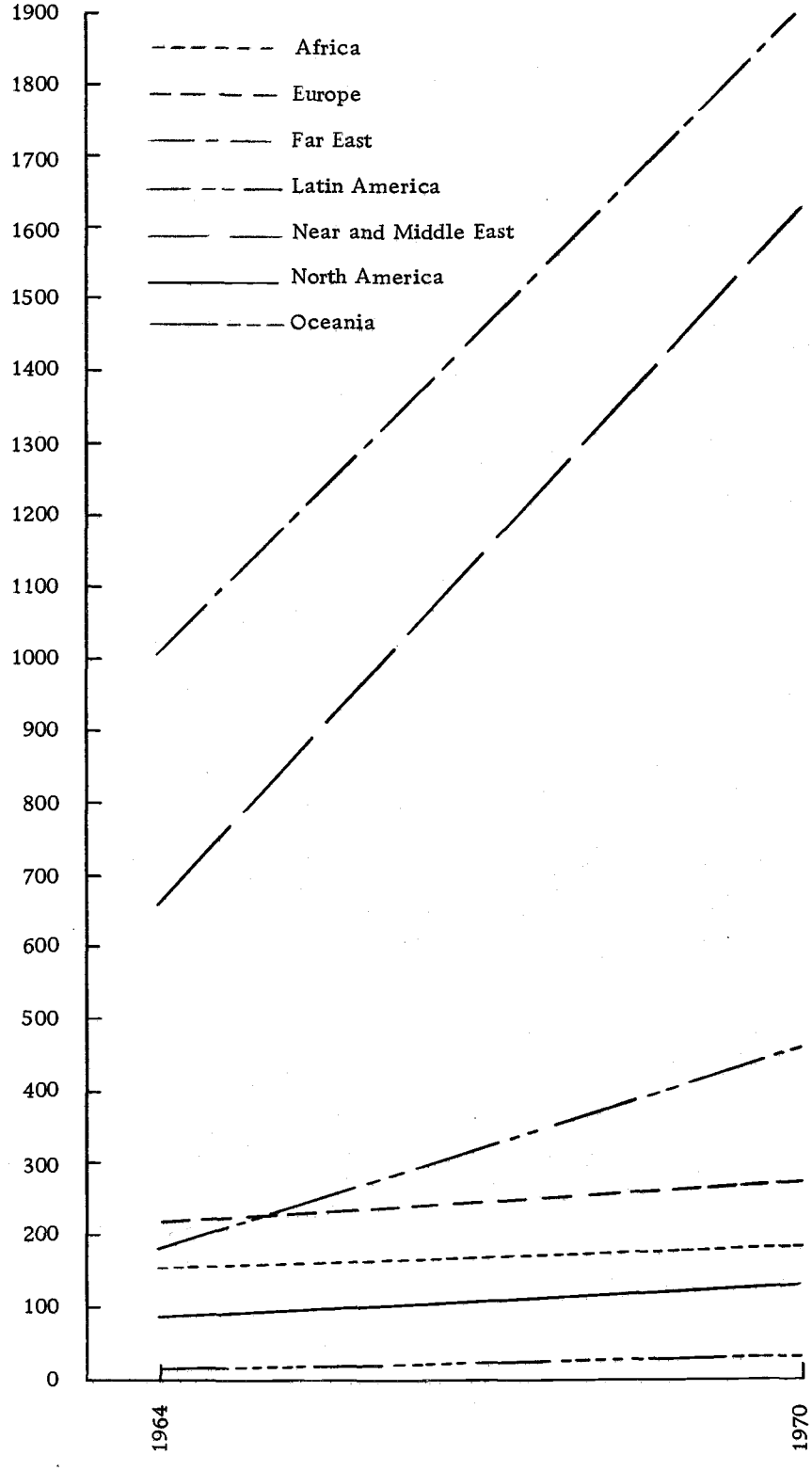

Figure 3. Foreign Students in California State Colleges 1964-1970.*

*California State Colleges, 1970

This study was further limited to information available from a number of sources including the following:

1. Information available from the Registrars offices (applications)
2. Information from records office (grades)
3. Information from Counseling and Foreign Student offices
4. Information available from individual departments and from interviews with faculties
5. Information available from returned questionnaires

Definitions of Terms

Utilization of Training

Utilization of training was defined, in percent, as the amount of college training used by a graduate in his present job as rated by the department the student graduated from by comparing departmental goals and alumni job descriptions or, in the case of alumni who returned questionnaires, by their evaluation of utilization of training.

Foreign Student Graduate

This term was defined as including any foreign national who had received a diploma or degree from a school within the California State College system not inclusive of those in possession of a permanant visa upon application for admission to the college of graduation.

Academic Success

Academic success was defined as the over-all grade point average acquired by the student upon his graduation from college as rated on a four point scale (referred to as grade point average, G. P. A.).

Technician

A technician was defined as someone graduating from college with a recognized certificate of completion at a lower level than a four year degree program.

Laboratory and Activity Course Hours

These were defined in percentage as the number of credit hours, out of the total credit hours taken at the college of graduation, that were held in direct conjunction with a laboratory or activity class session.

Leadership Course Hours

These were defined in percentage as the number of credit hours, out of the total credit hours taken at the college of graduation, that had as their stated purpose the development of: leadership, teaching, supervisory, administrative or management abilities.

Native Country

Native country was defined as the country listed as that of citizenship when the student applied for admission to college.

Latin America

Latin America was defined as including Mexico, Caribbean, Central America, and South America. Cuba was not included.

II. REVIEW OF RELATED LITERATURE

As this study was primarily dealing with prediction of academic success, utilization of training and return home rate the review of literature was directed toward answering the following questions:

(1) What were the characteristics which may have predictive value in relation to academic success, utilization of training and return home?

(2) What methods have been used in the past to define and predict academic success, utilization of training and return home?

In order to obtain this information a review of books, articles and research projects was conducted. Letters were also written to leaders in the field of International Education throughout the United States and interviews were conducted with eight of these individuals in the State of California and one individual working with the Council of the Americas in New York.

Prior Studies of Characteristics of Foreign Students

Foreign students may have similar problems and characteristics but they have them in different degrees as a result of widely differing backgrounds. Individuals who had been responsible for foreign student programs over the past years had, through their own individual

experience, become aware of certain characteristics which were peculiar to the Latin American groups within the foreign student population of the U. S. (Ruscoe, 1968).

In general, little was known about the relation of United States training and subsequent professional advancement in the home country (Cormack, 1969). Some specific studies were available but many lacked scientific methodology and the background of experience and research in Latin America was very limited. Ruscoe (1968) completed a study to find out information on background, current attitude and future aspirations of Latin American students. This study was one of the most scientific approaches to a large analysis of the characteristics and aspirations of Latins, however, it did not go further into an analysis of academic success and utilization of training.

Many studies related to students from other countries had looked at these problems specifically. Although their approach may have been useful one cannot assume that findings, even though substantiated in several independent researches, from studies of African, Asian or European students, are applicable in the Latin American setting. The available studies indicated that there was a wide diversity in the characteristics of foreign students and the predictors of success depending on the home country and that one must look at the movement of the student from and back to his country as an inseparable whole, from his selection to his arrival and stay abroad, his preparation for return, and finally to his return nome and subsequent career.

Before attempting to identify factors which might lead to academic success and utilization of training it was interesting to note the relationship between the two. The question of the nature of the relationship was not unrecognized in literature on foreign students but few studies concentrated on the area, perhaps because of the difficulty of follow-up on foreign students. One study by Lambert and Bresler (1956), inquired into student attitudes toward their studies and the anticipated impact of these studies on their future careers, which were identified as varying greatly depending on the field. (Those in business administration were the least concerned about academic success since this was "of minor importance to their advancement chances on return").

Many studies referred to academic success, utilization of training and return home as separate factors. For the sake of clarity this study presented the three in a separate format, although it must be remembered that in the final analysis they came together in order to produce a combination of factors producing optimum success.

Common Factors Affecting Academic Success and Utilization of Training

Research studies indicated several factors that required investigation. These included age, sex, marital status, and prior employment experience (Ruscoe, 1968; Storm and Gable, 1961).

Age and sex were related to other variables, sex being related to area of specialization and age being related to marriage and prior experience which were identified as predictors of academic success and utilization of training.

Factors Affecting Academic Success

What academic success did foreign students have and what factors seemed directly related to this success? According to several studies foreign students in U. S. institutions generally did as well as American students (Walton, 1967; Putman, 1961, U. S. Dept. of State, 1971). One nationwide survey reported 48 percent superior or above average, 30 percent average, and 15 percent below average, but contained no comparison with Americans (Koenig, 1953). Another study asked how the performance of foreign and American students compared and found that 53 institutions indicated performance was similar, 32 institutions said better and one said foreign student grades were below the general scholastic average (Cieslak, 1955). Thompson (1951) found the average G. P. A. to be above 3.0 each quarter for three years. Although the evidence here was not great, it seemed to bear out the feeling that in general foreign students do as well as their American counterparts. The question of whether some faculty grade foreign students more leniently than American students

inevitably arose. This factor may affect the validity of conclusion that the two groups have similar academic success.

The actual identification of factors contributing to success was attempted a number of times, but with some inconsistency of results due to the many different classifications of foreign students. Little empirical evidence seemed to be available specifically related to Latin Americans however, on the basis of research completed on other foreign student groups, the following factors are ones that required investigation to determine how they related to Latin academic success.

Orientation Programs

Much discussion and activity, but not a great deal of empirical evidence, was centered in this area.

Three basic types of orientation were used in varying degrees: predeparture, orientation after arrival in United States and reorientation before return to native country.

Useem (1955) suggested that orientation should concentrate on academic life and language aid followed by social aid and that re-orientation before return home might also be helpful. Ruscoe (1968) indicated that orientation should emphasize the informal aspects of university life followed by formal and academic aspects. He further recommended that different programs in the United States be tried on

an experimental basis to determine if different types of students from Latin America might benefit from different approaches to orientation.

Bosco (1967), commenting on an institute for orientation of Latin American students suggested a 15-week in-country orientation including language study, tours, cultural and university orientation. Storm and Gable (1961) stressed both in-country and United States orientation including: nature of American living, and pedagogical techniques and cost of living. The U. S. Operations Mission, Training Evaluation Section in Indonesia (1959) indicated that 28 percent of the participants either received no orientation or considered what they did get of little help, however, the organizers felt it was of great importance. The majority of the items that the participants thought important for inclusion in orientation where related to American living habits.

Walton (1967), stated that students attributed success or failure to themselves personally, rather than participation in orientation programs. Walton concluded on the basis of analysis of several systematic studies, that orientation seemed to have had little effect on the academic adjustment of foreign students. Although there were a number of promising reports and evaluations of orientation programs, the empirical evidence as to the exact success of different programs was inconsistent.

Practical Experience During Training Period

This was mentioned by several studies as an important factor affecting academic success as well as future utilization of training (Walton, 1967; Useem, 1955; Copen, 1971). Useem indicated that practical experience resulted in self discipline, improved standards of conduct in the world of work, provided a practical conception of effective administrational methods, and the added divident that the returning foreign student was able to claim qualification on the basis of practical experience. Twenty-five percent of respondents in a U. S. Technical Cooperation Mission Evaluation Study of Indo-American Participant Training Programs (1959) mentioned, among other things, that more experience in the field, practical experience, was needed in their training program. Similarly an evaluation of worldwide participant training mentioned the shortage of "practical" work during training (ICA/AID, 1966).

Language Competence

This was mentioned again and again as an indicator of academic success. When academic performance was poor, two factors were usually indicated: inadequate English and difficulty in adjusting to American university life. Some studies showed a correlation between language facility and academic performance (Moore, 1953; Warmbrunn

and Spalter, 1957; E. L. I., 1959; Putman, 1961). Others indicated that poor performance was a function of more than one factor. Only when coupled with personal maladjustments, inadequate preparation or lack of motiviation did the language handicap lead to academic failure (Beals and Humphrey, 1957).

In an analysis of the validity of English language screening instruments for foreign students entering University of California, Los Angeles, it was found that the speech interview, the Larry Ward English Examination for foreign students and the California Reading Test were the three most valid scales for prediction of G. P. A. However, the suggestion was made that further investigation should continue to improve the predictive effectiveness of screening instruments. On one hand, proficiency in English was considered to be the greatest single factor in the academic success of the foreign student in the United States (Burke, 1969; Eriksen, 1966; Hope, 1965; Ruscoe, 1968). On the other hand, English was not considered of prime importance in determining student success (Lara, 1966; Maxwell, 1965; Mulligan, 1966; Parakon, 1966; Schnitzen, 1966; Wakeland, 1964; Chase and Stallings, 1966).

In short, the research suffered from some inconsistency and in many cases scientific methodology was not evident. Undoubtedly, knowledge of English did play a part in the effectiveness of training

in the United States, although its effect on final utilization of training should be somewhat less.

Availability of Host Family Activity

These programs were mentioned by several sources (Ruscoe, 1968; Jenkins, 1968) as having a direct influence on the solving of academic problems and achieving fuller effectiveness of training in direct relation to Latin American students. While there was little scientific evidence given to substantiate the suggestions it would seem relevant to follow the suggestion further in light of other evidence relating to formal orientation programs. In addition, the type of living accommodations while at college was suggested as having a direct bearing on orientation and adjustment (Walton, 1967).

Transcript Evaluation

Several studies indicated that it was important that admissions offices be able to evaluate previous Latin American student academic performance in terms of United States standards so that differences could be recognized early and help could be given before the student failed because of inadequate background. This was seen as a critical area in both graduate and undergraduate education. In addition these studies pointed to the need for these transcript evaluation officers to be made aware of various

yield studies which referred not only to who may succeed but who will come when admitted and who will return home. This became increasingly important as enrollment pressures mounted and financial sources decreased (Paraskevopoulos, 1968; Useem, 1955; Copen, 1971; Livingstone, 1964).

Type of Financial Aid

The type of financial aid foreign students received had several interesting ramifications as to academic success and utilization of training. Clearly the student must have had sufficient resources to complete his program but surplus resources may have hindered his program. Several studies suggested that the source of financial aid motivation, and academic work success were all tied quite closely together. Livingstone indicated that financial aid needed to be directed to those who would make the best use of it in the United States, and on the return home (1964). In addition, if the financial aid was given by public and private Latin American institutions, it was quite likely that it would go to individuals who already occupied positions of responsibility and who were most likely to return home and put their education into practice (Copen, 1971). In addition Storm and Gable (1961) found that the provision of follow-up support for the student following his return home proved invaluable.

Ruscoe (1968) made some further observations as a result of his study of Latin American students which may have a direct relation to academic success and utilization of training. He found that students reporting only financial assistance from their families consistently showed little or no prior work experience, only 20 percent, primarily older students, having held a full-time position. These came from families with high income and education.

Students reporting scholarship as their exclusive source of finance come from families with low income and education backgrounds. Only 39 percent of these students reported no prior work experience.

Students consistently reporting their own employment as the major source of financial income come from middle income families having a minimum of secondary education. Only 37 percent of these students reported no prior work experience.

Low grades and reporting of home as the consistent major source of finance correlate highly. However, these students anticipated little trouble in finding a job in their chosen field at home. Specific evidence was found that to a reliable degree, students who were admitted with some sort of financial aid (scholarships, fellowships) were less likely to incur probationary status than those admitted without such aid (Hountras, 1957).

Use of Standardized Tests

Screening foreign students was attempted in numerous ways. Sims (1969), stated that tests appeared to be less predictive at the graduate level than at the undergraduate level. Paraskevopoulos (1968) concurred that American standardized tests had questionable value except perhaps for a standardized English test which may have had some value for predicting academic success. His study indicated that the use of the Cattell Culture Free Test of Intelligence had a correlation of . 35 with second semester G. P. A.

Kaplan and Jones (1964) achieved relative success in the comparison of various screening tests and found the California Reading Test, Speech Interview and Larry Ward test of Articles most valid for predicting academic success. They concluded that prediction by a battery of diversified measures was statistically significant, but the degree of relationship between the coefficients of multiple correlation was not high.

National Background

The background of a specific student had much to do with his adjustment and academic success. One survey at Purdue indicated a correlation between nationality and problem scores derived from questionnaires, for example students from China and Turkey reported

more problems than students from Norway or Canada (Forstat, 1951). As a result many studies dealing with the social and cultural adjustment of foreign students both in the United States and after their return home were launched. These studies developed the theory of culture shock and the U curve hypothesis stating that adjustment was felt to be easy and successful to begin with, but was followed by a "crisis" in which one felt less well adjusted. Finally, one began to feel better adjusted, again becoming integrated into the foreign community (Walton, 1967). While some studies questioned this theory (U. S. Advisory Commission, 1966) the idea should not be dismissed. Cieboter (1969) concluded at the end of an analysis of factors relating to performance of 218 students at the University of Florida that the ability of any foreign student to do well in graduate school appeared to be directly related to the proximity of his geographic area of origin to an English speaking area or to a center of Western culture.

What was needed for this study was a specific analysis of the success of different rural and urban students from different countries within Latin America.

Previous Academic Achievement

This was usually considered the strongest predictive factor in future academic success (Sims, 1969; Paraskevopoulos, 1968). Previous academic success needed to be looked at in light of several

other factors however. It became increasingly evident that not only the level but amount of previous academic work was a predictor of academic success. This was especially significant for students who previously studied outside their home country either in the United States or Europe, Storm and Gable (1961), Cieboter (1969) and Paraskevopoulos (1968) concurred on this point. Cieboter indicated that transfer students did attain slightly higher first semester G. P. A. scores than the direct students. Elliott (1969) stated, in recognizing this need, that the Junior College was likely to play an increasingly important role in foreign exchange programs of American higher education. There was some evidence that foreign students at the graduate level perform better than at the undergraduate level (Walton, 1970; Walton, 1967; Hountras, 1957). In many cases the foreign student may have been able to obtain the basic undergraduate work at home. In light of possible academic success, financial and enrollment factors, this would have seemed advisable wherever possible (Pearson, 1960, Gerritz and other, 1969).

A workshop report dealing directly with the problem of Latin American transcript evaluation and previous academic achievement indicated the following (Slocum, 1971:1):

> Evaluators should work from the original Spanish with the aid of translation and should be wary of attempts in translations to express Latin American degrees or titles and grades in United States terms. They should also not attempt to express degrees or grades in United States terms for record keeping purposes. No exact equivalences of either exist.

The emphasis here would clearly seem to be on the importance of arriving at sound judgement of the level and quality of an applicant's preparation rather than looking at his exact grades.

In summary the following factors were emphasized in the review of literature as important predictors of academic success: age, sex, marital status, prior employment, availability of orientation, practical experience during training, language competency, availability of host family program, availability of trained transcript evaluators, type of financial aid, use of standardized tests, natural background and previous academic training.

Factors Affecting Utilization of Training

Two general approaches, biographical and statistical, were used to identify factors affecting utilization of training. Several studies emphasized that the evidence of utilization should not rest on statistical analyses alone for students were more than mere statistics. What was important was that they often turned up in very important posts at home. Walton (1967) made a very impressive biographical summary of such instances. This selective data was undoubtedly useful for

promoting the programs in the United States and probably established the fact some progress had been made but the use of this type of research in establishing general guidelines may be questioned.

Numerical and statistical approachs were more common and an examination of these provided a picture of widely varying degrees of utilization depending on the country and type of training involved. Useem (1955) indicated that in India less than 10 percent would ever have jobs in which they work full time in the field for which they took specialized training. An evaluation study of Indo-American participant training programs (U. S. Technical Cooperation Mission, 1959) stated that 91 percent of the participants used their training. The interviewers in this evaluation study indicated that 36 percent made substantial use of their training. An evaluation of participant training (ICA/AID, 1966) stated that three out of five had made extensive use of their training. A scale was constructed to cross check against other survey items and 38 percent were classed as "very high" utilizers with another 30 percent as "fairly high" utilizers.

A follow-up study of participants using U. S. training in the Philippines (Peter and Schlesinger, 1959) stated that 55 percent of the participants indicated full utilization of training while supervisors rated full utilization at 43 percent. Other participant training programs gave similar ratings. Ruscoe (1968) indicated that 71 percent of Latins expected to return home and 23 percent expected to find

employment in a large firm, 19 percent in an educational institution, and 14 percent in government. Expectations about future employment were not consistently high.

Rathore (1958) found that less than half declared that in there current positions they were able to use some of the knowledge and experience they had gained in the United States in their current position. Ninety percent stated that if they had been asked about utilization of knowledge in their first or second year back in Pakistan they would have been forced to evaluate their experience in America as a waste of time. In reference to the availability of data on Latin Americans, Bowles, the former education director of the Ford Foundation, stated (1964:20) "We have no background of experience with Latin Education."

Specific Area in Which an Individual is Trained

The United States institution could select a trainee who could achieve excellent academic success but achieve minimal utilization of training because his talents were not required at home. Again and again the recommendations were made that the field of training in which participants are sent abroad should be determined on the basis of need in the home country (Bremseth, 1959; Walton, 1967; ICA/AID, 1966).

But even with this self evident need for planning and coordination continual problems arose. Kizilbash (1964) stated that little was known about how many of the 2000 Indian engineers studying in the United States each year returned and where they got jobs. Useem (1955) in an independent survey found only 55 percent of students sponsored by central and state governments employed in fields for which they were trained. Moreover, they found instances in which additional persons were being sent for training in fields where the previously unemployed were still unemployed. Ward (1966), former director of the Los Angeles office of the Institute of International Education noted the uselessness of long term training of teachers in the United States for Latin America. Livingstone (1964) indicated that the major deficiency in the training programs for Costa Rica was the frequent lack of relevance to the technological needs. Storm and Gable (1961) noted that in Iran there were a great number of students who are doing work for which they were not trained, and often there was no opportunity to employ these people in their area of college specialization.

The student should have direct involvement and interaction during the planning stage so he will know how his personal goals relate to the opportunities in his country. This would also increase his interest, motivation and back home involvement (ICA/AID, 1966; Peter and Schlesinger, 1959).

Level and Nature of Training

Not only must the correct person be selected for the appropriate field of training but the level and nature of that training should fit certain guidelines.

Pearson (1960) suggested that foreign students must have a fundamental "know-how" of the operation of industry. He suggested that engineering students be given some vocational training to enhance this aspect. This emphasis was borne out by several other studies including the ICA/AID study referred to in the previous section.

In addition to the need for an emphasis on practical vocational training suggestions were made in several studies for the need of the skills of a generalist rather than those of a specialist (Useem, 1955; Dubois, 1956; C.E.I.P., 1961). Useem stated that it was rare for foreign educated Indians to be employed in posts corresponding to their specialized fields of training. Furthermore as the Indians moved up in the bureaucracy they assumed more administrative functions which required not only acquaintance with a diversity of subjects but also organizational skills.

Also mentioned was the need for flexibility in curricular selection if the required courses were not practical in nature, general, or suited to the direct needs of the foreign student (Copen, 1971; Walton, 1970; Bremseth, 1959). Copen suggested that the curriculum

of the Latin American student should be modified through the use of electives and waivers to make it more useful to his home environment. This included the elimination of courses dealing solely with subjects or institutions peculiar to the United States.

Social Status

The social status an individual had at home had direct implications for high utilization of training. The degree of implication seemed to vary from culture to culture. Kizilbash (1964) commented that the whole future of returnees to India looked dim because of seniority rules and position status. Useem indicated that one third of returnees relied on foreign qualifications to get a job while two thirds used influence in addition to their foreign training to help get them placed. On the average it took persons without influence nearly a year to get a permanent job. Influential connections cut the period down to a fraction of this period or to a few weeks.

Bennett (1958) indicated that the structure of the Japanese society is such as to require some kind of sponsorship, either directly by a person or group, or indirectly in the form of promised jobs and connections. Little study seemed to have been done in Latin America but Storm and Gable (1961) stated that the majority of Brazilians brought to the University of Southern California for training in the school of Public Administration were from the upper levels of society

and that all had returned to prestige jobs in a university or with the government where they made direct and valuable use of their training.

Against this rather dim outlook a follow-up survey of participant training in the Philippines indicated that academic training allowed the individuals concerned to move up the social ladder from the position of their parents. No mention was made of their initial lower status being a problem for finding jobs or in advancement (Peter and Schlesinger, 1959).

Whatever the case, where status was an important consideration, an individual of low status was unlikely to get a significant post regardless of how highly educated he may have been or where he received his training. While colleges may be sympathetic toward sponsoring persons from low status levels this practice may prove frustrating to the individuals concerned. It remained to be shown what the exact relationship is in Latin America with regard to different fields of specialization in different areas.

Leadership Training

The amount of leadership training was regarded by a number of studies as a necessary adjunct to training if the student was to achieve full utilization of his specialized education when he returned to his native country (Heft, 1964; Pearson, 1960; U. S. Technical Cooperation Mission, 1959; Peter and Schlesinger, 1959). Introduction

of new ideas by the returnee was facilitated when a substantial number of fellow employees were also trained abroad (Dubois, 1956; Beals and Humphry, 1957; Useem, 1955; ICA/AID, 1966). In addition the returnee needed to be able to adjust his personal behavior in certain necessary ways, attitudes of tact and flexibility were often required to make new ideas acceptable (Bennett, 1958). The implication here was that some leadership training would put the returning student in a better position to introduce new ideas to his countrymen and hopefully persuade them to implement the ideas.

Availability of Facilities and Equipment

> Useem (1955:74) quoted Nehru as saying:
>
> > I have found often enough that Indians who come back after a full course of foreign training are very competent, they can do much but they always ask for complicated machines to do their work. If you get accustomed to conditions in America, its machines and technological conditions, and if you find there is not the same base here in India, you are disgruntled and dissatisfied shouting for something which you have not got. It is not a good thing to do so.

This problem was metioned as one of the chief obstacles to utilization of training in participant training programs in Taiwan and the Philippines and appeared to emphasize the need for a practical vocational type of training for many foreign students.

Follow-Up Support

Follow-up support by the college of graduation or supporting agency was mentioned by several studies as playing a large part in training utilization. The ICA/AID (1966) study found this factor had a stronger association with training utilization than any other factor included in the study. Among returned participant technicians having follow-up support and working in their field, the proportion of high utilizers was 13 times higher than low utilizers. In the other groups having no follow-up the proportion of high utilizers was only three times larger than that of low users. This evidence was substantiated by the follow-up study in the Phillipines (Peter and Schlesinger, 1959).

Focus on Application of Training in Native Country

This type of emphasis prior to leaving and during the foreign training period was also seen as an important step in utilization. A follow-up survey on "Using U. S. Training in the Philippines" (Peter and Schlesinger, 1959) indicated that participants who later felt they were more successful appliers of U. S. training kept a focus in the back home situation during their stay in the U. S. They were more likely to keep communication channels open, discuss with their colleagues possible applications and generally keep abreast of the situation at home.

A foreign student advisor, replying to published criticism of the university for permitting foreign students to remain here, spoke out in a 1961 letter addressed to a journal in reference to foreign countries evident lack of interest in contacting their students and making them aware they were wanted at home (Putnam, 1961).

Length of Stay in the United States

It was widely assumed that a prolonged stay in the United States "alienated" a foreign student from his home country and culture and integrated him into that of the United States. Not only did this reduce his chances of work success in his native country, but it lowered the probability of him going home (Walton, 1967). This would tend to substantiate the extension of the U curve hypothesis discussed earlier. Beals and Humphrey (1957), concurred in a study specifically relating to American students which indicated that the returned students were substantially different from other Americans and that these differences were partly related to the duration of the student's stay, their age at the time and the degree to which they participated in American life. Simerville (1961) stated that returnees to India had great difficulty in finding appropriate employment, especially if they have been absent for a long time. Storm and Gable (1961) also concluded that we were doing the foreign student a disservice if we brought about so complete a change that he began to think like an American and became unwilling

to return home. They emphasized the need for a concentrated supervised program which leaves little room for free time so the student would look forward to the pleasant less hurried life led at home (U. S. Operations Mission, 1959).

On the other hand an Indonesian study indicated that half the returnees felt the program of four to nine months was too short. Over two thirds of the returnees questioned in an evaluation of participant training programs in Taiwan (Bremseth, 1959), stated that the one year program was too short. Similarly, a follow-up survey of participants using United States training in the Philippines (Peter and Schlesinger, 1959), indicated eight months was too short as did "An Evaluation of Participant Training"(ICA/AID, 1966).

The whole concept of alienation, what it was and how it worked, was a challenging area for study, especially in relation to ideas on orientation, host family and community involvement programs. What was needed was an analysis of the duration of stay in relation to success and return home in various types of programs with foreign students from different countries.

In summary the following factors were emphasized in the review of literature as important predictors of utilization of training; age, marital status, prior employment, area of training specialization, level of training, social status, amount of leadership training,

availability of facilities and equipment, follow-up support, focus on application in native country and length of stay in the U. S.

Return or Non-Return

Reliable data concerning migrating student talent, characteristics of the students involved, and the reasons for their non-return was very difficult to secure. It was not easy to say when a student has definitely reached a point of non-return. Was it when he prolonged his stay to two or three years or was it when he said he "hoped" to stay permanently? It was interesting to note that the question of returning home was the item most frequently left unanswered in the questionnaire used in a study completed by Ruscoe (1968). The Institute of International Education (1970) indicated the same trend in their yearly national survey of students. They indicated that it seemed apparent that student exchange continued to be a significant avenue of immigration. To the question of whether or not they intended to remain in the U. S. after completing their studies 15 percent said they did, 46 percent said they did not and 39 percent did not answer the question. On the state level foreign student advisors in the California State College system indicated that the return home rate was at best fifty percent (California State Colleges, 1967).

The description of factors affecting student return to their native countries was attempted by several studies. Walton (1969) indicated

that migration student factors could be divided into push and pull factors, the former consisting of negative inducements to return home and the latter of positive inducements to stay permanently in the U. S. Push factors included psychological alienation from the home country, limited job possibilities and political persecution. Pull factors included high salaries, favorable conditions for professional growth, and personal ties such as marriage to an American. Additional factors mentioned included the importance of contact between the native country and the student abroad concerning possible employment in the home country as well as a careful analysis of the fields of specialization of non-returning students in the selection process.

A study completed by the Education and World Affairs Committee on the International Migration of Talent(1970) emphasized several areas that should be considered when attempting to reduce the migration of students. According to this study any country which was dissatisfied with the rate of return of students could increase it markedly by adopting the following principles: identify national manpower requirements of high priority, educate students to the highest degree at home, keep in touch with students while they are studying abroad and establish incentives to return by assuring a satisfactory job on completion of training (sponsored students could be further induced to return by requiring a bond which may be forfeited if the student does not return).

A report published by the Office of the Chancellor of the California State Colleges (1967) recommended the adoption of the J visa requirement which would require the student to return to his home nation or to some other nation for at least two years after completion of his studies.

In reviewing the factors stated as affecting a student's return it was noted that several of the factors mentioned were similar to those already identified as having a possible relation to academic success and utilization of training. In summary the factors indicated by the review of literature as important predictors of return or non-return were: length of stay in U. S. (alienation from home country), area of training specialization, political situation in home country, personal ties such as marriage to an American, contacts with home country during training, financial inducement and visa type.

Previous Methods Used to Determine Academic Success, Utilization of Training and Return Home

It became evident during the review of literature relating to academic success, utilization of training and return home of foreign students that the results of the research often grew out of the experience and insights of the people concerned rather than out of the findings of statistical educational research. The studies reviewed in

the course of this thesis fell into one of three general categories (1) biographical studies making recommendations based upon general experience, insight and reading of other research reports, (2) studies having a definite numerical base but having little or no statistical analyses beyond percentages and (3) studies having a numerical base that had been treated in a formal statistical manner in order to reach specific conclusions.

The major studies reviewed for this thesis that fell into the first category included those completed by Boscow (1967), Bowles (1964)(1966), Bridgers and Hall (1969), Copen (1971), Cormack (1969), Dubois (1956), Education and World Affairs (1970), Gerritez (1969), Heft (1964) Jenkins (1968), Lambert and Bressler (1956), Kizilbash (1969), Livingstone (1964), Mulligan (1966), Pearson, (1960), Simmerville (1961), Storm and Gable (1961), Walton (1970) (1969) and Ward (1966).

The studies that fell into the second category as having a numerical base but little or no statistical analyses included a Hong Kong study by Baker and Mestenahuser (1963), Beals and Humphrey's study of Mexican students (1957), Bremseth's study on the Participant Training Program in Taiwan (1959), Cieslak's problem survey (1955), California State College studies (1970)(1971), the ICA/AID follow-up study of 12,000 participants (1966), the Institute of International Education annual census of over 2500 institutions (1970)(1971),

Moore's follow-up studies of overseas students (1959)(1964), Ruscoe's follow-up study of Latin American foreign students and others including Wakeland (1969), Thompson (1951), Rathore (1967), Koeing (1951) and Useem (1955). Several major U. S. government studies used this approach including: U. S. Department of State, Agency for International Development Participant Selection and Placement Study (1971), U. S. Operations Mission, Evaluation of Participant Training in Indonesia (1959), and the U. S. Technical Cooperation Mission, Indo-American Participant Training Program Evaluation (1959).

Studies that fell into the third category, those having both a numerical base and a statistical treatment to determine conclusions, included Burke's study of foreign students at the University of Southern California (1969), Cieboter's study of foreign students completed to determine factors relating to academic success (1969), the study completed by Chase and Stallings to determine the validity of tests of the English language as predictors of academic success (1969), Elliot's study of factors affecting foreign student performance in seven Junior Colleges (1969), the English Language Institute study (1967), the study completed by Hountras at the University of Michigan to identify significant predictors of foreign student achievement (1955), Kaplan's study completed to determine criteria for foreign student success (1964), Paraskevopoulos's yield study at the University of Illinois (1968), Peter and Schlesinger's study of using U. S. training

in the Philippines (1959), Warmbrunn's study of the distribution of academic failure of foreign students at Stanford University (1967), and theses by Maxwell (1965), Moore (1953), Eriksen (1966), and Parakarn (1966).

This study was completed using formalized statistical procedures and as such fell into the third category outlined previously. The review of literature did not locate any studies treating the data in a manner similar to that used in this study. The majority of studies reviewed that incorporated a statistical treatment used the Chi-square technique or an individual correlation analysis. On the basis of advice from the statistics consultant these procedures were not deemed as desirable as multivariate analyses.

The basic advantage of the multivariate analysis over the individual correlation analysis was that the multivariate approach combined the background characteristics into an overall analysis while the correlation approach brought the characteristics together individually. Since the students had a combination of background characteristics the multivariate analyses were used. Many studies outside the International Education area have used these multivariate analyses. The computer programs used in the analyses were part of a commonly available computing system.

Any analyses, biographical, numeric or statistical, completed to determine characteristics affecting academic success, utilization

of training or return home must be based on background data relating to specific students. Obtaining this data was a difficult task.

Two methods were used (1) direct interview and (2) the questionnaire and review of records method. This study used the latter method. It was interesting to note the success of prior attempts to obtain information of the type this study requested via the questionnaire.

Moore and Forman (1964) in a study directly related to follow-up of 458 students in 15 countries had an overall return rate of 32 percent of the questionnaires ranging from a high of 67 percent in Isreal to a low of 10 percent in Iraq. Useem (1955) indicated a very good sampling using the interview technique. Ruscoe (1968) in a study directly associated with follow-up of Latins in the United States had a return rate of 42 percent of his questionnaires which he considered high. The majority of studies encountered used this latter approach due to the cost involved and the difficulty is locating alumni for personal interviews.

One of the major difficulties in studies of this type was in obtaining an objective rating of utilization of training. The usual method employed was a simple opinionated response from the alumni or researcher involved. This study used a similar approach but attempted to objectify the procedure by involving the staff of the

department the student graduated from in rating utilization of training based upon a comparison of departmental goals with the alumni job descriptions.

Summary of the Literature

This review of the literature provided the necessary information to determine that various characteristics seemed to be important determiners in the lives of foreign students. It also provided supportive evidence of the feasibility of using these variables to construct models for predicting academic success, utilization of training, and return home.

The variables emphasized in this review were:

1. age
2. sex
3. marital status
4. prior employment
5. availability of orientation programs
6. practical experience during training
7. English language competency
8. availability of host family program
9. availability of trained transcript evaluators
10. type of financial aid
11. standardized test scores
12. national background
13. previous academic achievement
14. length of stay in the U. S.
15. area of training specialization
16. level of training
17. social status
18. amount of leadership training
19. availability of facilities and equipment

20. focus on application of training in native country
21. follow-up support
22. contact with home country during training
23. visa type

III. PROCEDURES

Pilot Study and Preliminary Examination of Files

In order to determine which characteristics were available from state colleges files and returned questionnaires a pilot study was completed at California State Polytechnic College at San Luis Obispo. This entailed a detailed follow-up of twenty-five students involving a search of records and the construction and mailing of a questionnaire to develop a complete file of characteristics on each student. The data were then analyzed using the procedures outlined in the following pages of this study. In addition, visits were made to each of the colleges included in this study to determine the similarity of records and the availability of data.

As a result of the pilot study and the preliminary contacts with the other colleges several factors became evident about the availability of data and inclusion of specific variables in the study. First, data regarding student activity in host family programs were fragmentary due to the various community agencies running the programs each year and the difficulty of defining a host family. Second, no standardized tests were used on a systematic basis. Third, the return rate on questionnaires on the pilot study was thirty percent. This indicated that the questionnaire could be used only as a supplement and not as a complete source of data for a given variable.

As a result of these preliminary findings three factors suggested by the review of literature as having a relationship to the dependent variables in this study were not included in the study. These were host family activity, standardized test scores and availability of facilities and equipment in the home country. The first, host family activity, was identified in the review of research as a rather minor factor. The second, standardized test scores, were not consistently available in sufficient numbers for analysis. The third, availability of facilities and equipment, could only be generated by returned questionnaire information. To base any analysis on a thirty percent return rate on questionnaires was considered unadvisable. The level of training was considered, which should provide some indication of the need for more sophisticated support facilities in the home country.

The Sample

The sample was composed of all Latin American foreign student graduates who had graduated from the six state colleges in the five years prior to August 30, 1971. The sample included a total of 146 students, 27 from San Jose State College, 27 from San Francisco State College, 25 from California State Polytechnic College - San Luis Obispo, 25 from Fresno State College, 17 from Long Beach State College, and 25 from California State Polytechnic College - Pomona.

The Questionnaire

After analyzing the responses to the pilot study questionnaire the questionnaire was rewritten according to the suggestions of all individuals concerned at the six cooperating state colleges. A copy of the final questionnaire and attachments as well as a sample of the follow-up letter used is contained in Appendix A. This questionnaire was not designed to request information on all variables analyzed in this study but rather to act as a supplementary source of data for information difficult to find in college records. The return rate on the questionnaire was 42 percent varying from 52 percent at California State Polytechnic College, San Luis Obispo, to 18 percent at Long Beach State College.

Variables Analyzed

The review of literature demonstrated that there were selected characteristics that seemed to influence a student's academic achievement, utilization of training and return home. These variables were identified and used in describing the students, in testing for significance and in constructing prediction models.. The following variables were included in this study:

1. age
2. sex
3. marital status
4. previous work experience

5. availability of orientation program
6. employment during training
7. percentage of laboratory or activity courses
8. average English grade
9. availability of trained evaluations clerk
10. type of financial aid
11. native country
12. previous college training in the U. S.
13. previous college training in native country
14. location of high school training
15. length of time in the U. S.
16. area of specialization in college
17. level of training
18. father's occupation
19. urban or rural home background
20. percentage of leadership courses
21. follow-up contacts
22. contact with Latin America while training
23. where vacations spent
24. visa type
25. college of graduation
26. number of changes of major
27. level of responsibility of present employment

Coding of Data

Data analyzed in this study required a coding system. The data representing qualitative variables of, utilization of training, G. P. A., English G. P. A., percentage of laboratory and leadership courses, months of previous college training, number of changes of major, age, and the number of months spent in the United States prior to graduation were recorded and used without alteration. The remaining variables were qualitative and required coding. These variables, such as marital status, were non-numeric and had to be reduced to numeric form to be analyzed. Once these variables were coded, each portion

of an overall qualitative variable became independent and could enter computer analyses. The coding system is shown in Appendix B.

Treatment of Data

As previously stated the central problem of this study was to describe the characteristics of Latin American students who had graduated from the California State College System, to identify those characteristics which significantly predict utilization of training, academic success and return home and attempt construct prediction models for academic success utilization of training and return-home. The general design of the study included the following steps:

1. A description of the data was completed. This involved a description of the overall sample of 146 students as well as a description of sub-groups classified by college of graduation, area of specialization and area of origin.

2. A correlation matrix was developed in which each variable was compared singly with all variables in the study. Variables correlating above the .40 level with all three dependent variables, academic success, utilization of training, and return home were summarized and reported.

3. Linear regression analyses were completed to identify those variables contributing significantly to academic success. The first analysis included all variables and a summary was completed of those

variables showing a Student's t value above the .20 level (80 percent level of confidence). The second analysis included only those variables identified in the first analysis as having Student's t values above the .20 level.

4. Linear regression analyses were completed using only those variables available to a college upon a student's application for admission. The purpose of these analyses were to construct a model prediction equation for academic success. Only those variables showing a Student's t value above the .10 level (90 percent level of confidence) were included in the model.

5. Linear regression analyses were completed to identify those variables contributing significantly to utilization of training. The first analysis included all variables and a summary was completed which showed those variables having a Student's t value above the .20 level (80 percent level of confidence). The second analysis included only those variables identified in the first analysis as having Student's t value above the .20 level.

6. Linear regression analyses were completed using only those variables available to a college upon a student's application for admission. The purpose of these analyses were to construct a model prediction equation for utilization of training. Only those variables showing a Student's t value above the .10 level (90 percent level of confidence) were included in the model.

7. Discriminant analyses were completed to test the null hypothesis that the mean scores of the returning and non-returning group of students, in respect to 20 selected variables, were not significantly different. The statistic used was the F ratio at the .10 level (90 percent level of confidence).

IV. PRESENTATION OF FINDINGS

The analyses of data collected for the study are presented in five sections. The first section presents a general description of the data. The second section presents the results of the correlation matrix analysis. The third section summarizes the results of the successive stepwise multiple linear regressions related to prediction of academic success. The fourth section summarizes the results of successive stepwise multiple linear regressions related to prediction of utilization of training. The fifth and final section presents the results of the discriminant analyses in testing for significant differences between the returning and non-returning group of students.

General Description

The general description of Latin American graduates from the six state colleges involved in this study is in Table 1. This table, in addition to providing a description of the total sample of 146 students in the study, includes a description by the three sub-groups classified by: area of origin, college of graduation and area of specialization.

The average utilization of training was 72 percent, grade point average (academic success) was 2.67 and the return-home rate was 61 percent.

Table 1. General Characteristics of Latin America Students.

Variable		Total Group	AREA OF ORIGIN				COLLEGE						MAJOR				
			Central America	South America	Caribbean	Mexico	San Francisco State	San Jose State	Fresno State	Long Beach State College	Cal. Poly, Pomona	Cal. Poly, San Luis Obispo	Agriculture Major	Engineering Major	Business Major	Education Major	Other Major
Number		146	37	70	23	16	27	27	25	17	25	25	39	37	18	21	31.0
1. util. of training	%	72.0	68.4	73.0	76.7	74.0	75.1	74.4	47.8	79.0	73.8	85.0	70.3	78.5	65.0	84.5	53.7
2. grade point average		2.67	2.64	2.74	2.80	2.60	3.01	2.95	2.64	2.52	2.30	2.47	2.47	2.45	2.98	3.35	2 78
3. return home	%	61.0	58.3	66.7	56.5	75	44.4	48.0	76.0	47.0	63.6	84.0	89.7	50.0	62.5	66.7	30.3
4. Central America	%	26.0	-	-	-	-	25.9	25.9	20.0	11.8	36.0	32.0	43.6	21.6	5.7	9.5	30.3
5. South America	%	45.9	-	-	-	-	48.1	33.3	60.0	23.5	48.0	56.0	41.0	46.8	55.6	42.9	36.3
6. Caribbean	%	16.4	-	-	-	-	7.4	33.7	8.0	29.4	12.0	12.0	12.8	5 4	16.7	42.9	18.2
7. Mexico	%	10.9	-	-	-	-	18.5	3.7	12.0	29.4	4.0	4.0	5.1	13.5	22.2	4.8	12.2
8. San Francisco State	%	18.5	18.9	19.1	8.7	31.2	-	-	-	-	-	-	0	10.8	44.4	33.3	21.2
9. San Jose State	%	18.5	18.4	13.2	39.1	6.2	-	-	-	-	-	-	0	18.9	16.7	42.9	33.3
10. Fresno State	%	17.1	13.5	22.0	8.7	18.7	-	-	-	-	-	-	33.3	2.7	16.7	4.8	21.2
11. Calif. State College, Long Beach	%	11 6	5.4	5.9	21.7	31.2	-	-	-	-	-	-	0	10.8	11.1	19.0	21.2
12. Cal. Poly, Pomona	%	17.1	24.7	17.6	13.0	6.5	-	-	-	-	-	-	25.6	32.4	11.1	0	3.0
13. Cal. Poly, San Luis Obispo	%	17.1	18.9	22.1	8.7	6.2	-	-	-	-	-	-	41 0	24.3	0	0	0
14. technical training	%	6.2	2.7	11.8	0	0	0	0	8.0	0	0	28.0	20.5	0	0	0	3.0
15. bachelor's degree	%	76.0	89.2	64.7	69.6	87.5	59.3	66.6	84.0	82.3	100	68.0	76.9	91.9	83.3	28.6	84.8
16. graduate degree	%	18.5	10.8	23.5	30.4	12.5	40.7	33.3	8.0	17.7	0	8.0	5.1	8.1	16.7	71.4	12.1
17. average Eng. grade		2.75	2.72	2.77	3.09	2.69	3.03	2.98	2.70	2.80	2.48	2.44	2.47	2.46	2.75	3.30	3.03
18. lab or activity hrs.	%	31.3	30.5	32.8	35.7	26.8	16.0	27.3	35.3	28.1	33.8	47.8	45.0	39.9	8.28	24.9	21.9
19. leadership hours	%	13.3	11.8	14.8	20.9	10.9	18.5	22.5	9.8	13.4	7.4	6.92	7.9	4.9	23.6	27.8	13.1
20. previous U.S. college	mos.	15.3	15.6	12.2	18.9	19.7	7.4	22.3	16.9	17.7	18.1	10.5	12.5	17.9	17.8	11.0	18.2

Table 1. Continued.

Variable		Total Group	AREA OF ORIGIN: Central America	South America	Caribbean	Mexico	COLLEGE: San Francisco State	San Jose State	Fresno State	Long Beach State College	Cal. Poly, Pomona	Cal. Poly, San Luis Obispo	MAJOR: Agriculture Major	Engineering Major	Business Major	Education Major	Other Major
21. previous native college	mos.	11.2	8.4	14.6	15 5	8.8	17.4	13.3	8.9	9.2	7.7	9.2	10.8	5.7	6.2	30.7	7.0
22. age	mos.	291.1	269	301	339	268	290	306	273	296	291	289	289	280	276	361	266
23. months in U.S.	mos.	55.0	63.0	43.0	46.0	78,0	46.0	59.0	51.0	71.9	64.0	44.0	50.0	66.0	59.9	31.0	63.0
24. agriculture major	%	26.7	43.2	25.0	17.4	12.5	0	0	52.0	0	40	64.0	-	-	-	-	-
25. engineering major	%	25.3	21.6	26.5	8.7	31.2	14.8	25.9	4.0	23.5	48	36.0	-	-	-	-	-
26. business major	%	12.4	2.7	10.3	13.0	25.0	29.6	11.1	12.0	11.8	8.0	0	-	-	-	-	-
27. education major	%	14.3	5.4	22.0	39.1	6.2	25.9	33.3	4.0	23.5	0	0	-	-	-	-	-
28. other major	%	21.2	27.0	16.2	21.7	25.0	29.6	29.6	28.0	41.1	4.0	0	-	-	-	-	-
29. changes of major	%	.4	.54	.26	.56	.62	.33	.66	.28	.70	.16	.36	.30	.32	.44	.38	.70
30. sex (male)	%	82.2	86.5	82.4	65.2	93.7	70.0	81.5	84.0	70.6	92.0	100	97.4	100	94.4	33.3	69.7
31. married before admission	%	14.4	10.8	17.7	26.0	25.0	22.0	22.3	4.0	11.7	12.0	12.0	17.9	5.4	22.2	33.3	3.0
32. married during training	%	18.2	13.5	5.9	13.0	0	11.0	0	24.0	11.8	4.0	0	7.3	67.6	0	19.0	6.0
33. prior employment in spec.	%	43.1	37.8	51.5	56.5	25,0	33.3	44.4	52.0	47.0	24.0	60.0	69.2	21.6	27.8	80.9	21.2
34. prior employment outside spec.	%	19.2	18.9	14.7	34.8	37.5	33.3	11.1	28.0	23.5	8.0	12.0	15.4	16.2	22.2	14.3	27.3
35. employment during training	%	47.3	48.6	44.1	60.9	56.2	70.4	22.2	56.0	64.7	60.0	16.0	43.6	43.2	66.7	42.9	45.4
36. urban background	%	85.7	81.0	80.2	87.0	100	96.2	92.6	84.0	100	76.0	68.0	61.5	91.9	100	85.0	97.0
37. family financing	%	54.1	62.2	50.0	39.1	50.0	44.4	37.0	64.0	58.8	60.0	64.0	53.8	67.6	50.0	14.2	69.7

Table 1. Continued.

Variable		Total Group	AREA OF ORIGIN				COLLEGE						MAJOR				
			Central America	South America	Caribbean	Mexico	San Francisco State	San Jose State	Fresno State	Long Beach State College	Cal. Poly, Pomona	Cal. Poly, San Luis Obispo	Agriculture Major	Engineering Major	Business Major	Education Major	Other Major
38. personal financing	%	25.3	21.6	25.0	30.4	31.2	33.3	22.2	32.0	11.8	24.0	24.0	35.9	18.9	55.6	4.8	15.2
39. scholarship financing	%	27.4	27.0	30.1	43.5	18.7	29.6	44.4	20.0	35.3	24.0	12.0	20.5	16.2	5.6	90.5	21.2
40. J visa	%	16.4	10.8	16.2	39.1	25.0	3.7	22.2	8.0	82.4	4.0	0	5.1	5.4	11.1	57.1	18.2
41. F visa	%	78.8	81.0	80.1	60.9	69.0	88.9	74.0	92.0	5.9	88.0	100	89.7	89.1	83.3	42.9	75.8
42. father's occupation similar	%	29.6	18.9	41.8	39.1	20.0	14.8	24.0	44.0	25.0	20.8	48.0	52.6	16.2	32.2	42.8	3.1
43. follow-up contact	%	37.7	37.8	41.2	60.9	18.7	29.6	37.0	24.0	58.8	40.0	44.0	43.6	27.0	27.2	90.5	18.2
44. contact with Latin America	%	48.6	43.2	55.2	73.9	31.2	37.0	44.4	60.0	58.8	24.0	72.0	69.2	29.7	44.4	76.1	30.3
45. vacationing in Latin America	%	56.2	64.8	51.4	47.8	75.0	51.9	55.6	56.0	35.3	52.0	80.0	69.2	51.3	38.9	71.4	42.5
46. orientation available	%	35.6	24.3	41.2	52.1	43.7	15.0	33.3	72.0	88.2	8.0	16.0	33.3	18.9	22.2	76.2	36.4
47. trained evaluator	%	11.6	5.4	5.8	21.7	31.2	0	0	0	100	0	0	0	10.8	11.1	19.0	21.2
48. Latin America high school	%	86.3	83.8	94.1	91.3	62.5	92.5	88.9	88.0	70.6	88.0	84.0	84.6	86.5	83.3	100	75.8

The majority of the students, 49 percent, were from South America and had completed a bachelor's degree (76 percent). Each of the six colleges involved had a similar number of Latin American students with the exception of Long Beach State College which had a slightly smaller number. The most common areas of specialization were agriculture and engineering.

The students had an average age of 24 years, were male and unmarried. The predominant type of financing was from their families, 54.1 percent, and the majority, 85.7 percent, had urban backgrounds.

Nearly half of the students, 43 percent, had prior employment in their field of specialization while 19.2 percent had had some other type of employment outside their field of specialty. Seventy-eight of the 146 students in the sample had some type of prior employment and 87 percent of these 78 students had obtained employment at a higher level of responsibility following completion of their training.

The students had approximately one year of college training in their home country and the U. S. before they began their training in the U. S. and they were in the U. S. an average of 55 months before completing their training programs. Twenty-nine percent were in training programs similar to their father's occupation.

Thirty-seven percent had had some type of contact from their college since they had graduated and nearly half had some type of

contact with Latin America regarding employment opportunities while they were in the United States.

Correlations Between Selected Variables

An individual correlation matrix for all 49 variables included in the study was produced to identify singular correlations which might hold predictive value for the three dependent variables, utilization of training, academic success and return home, being investigated in this study. A further purpose of this analysis was to attempt to identify those variables highly correlated with given variables thus creating singular matrix problems in the following regression analyses.

Tables 2 and 3 report in summary form those variables correlated with academic success and return home at a level above the .40 level. Table 4 presents correlations between the three dependent variables in the study. No variables were identified that correlated with utilization of training above the .40 level.

Table 2. Variables Correlated with Academic Success.

Code No.	Variable	N	Correlation
15	bachelor's degree	146	-.466
16	graduate degree	146	.612
17	average English grade	146	.447
21	native country college training	146	.412
27	education major	146	.520
39	scholarship financing	146	.428

None of the variables in Table 2 show a high correlation with academic success. A moderate correlation in opposite directions was noted between the different levels of training and academic success while prior native college training and high English grades correlate positively with academic success. It was noted that prior U. S. college training did not correlate significantly (above .40) with academic success. The moderate correlation between academic success and scholarship financing may have reflected more careful screening for scholarship selection purposes. The negative correlation on bachelor's degree indicated that students completing bachelor's degrees had less academic success than those students completing other levels of training.

Table 3. Variables Correlated with Return-Home

Code No.	Variable	N	Correlation
44	contact with Latin America	141	.572
45	vacations spent in Latin America	141	.559

The two correlations variables shown in Table 3 tend to substantiate the findings suggested in the review of literature which indicate the two variables listed are important predictors of a student's return home.

Table 4. Correlation Between Dependent Variables: Utilization of Training, Academic Success and Return-Home.

Code No.		N	Correlation
1, 2	util. of train., academic succ.	101	.080
1, 3	util. of train., return-home	101	.189
2, 3	academic succ., return-home	101	.077

Table 4 indicates little correlation between the three dependent variables of the study.

In interpreting the data in Tables 2, 3 and 4 it should be emphasized that each pair of variables was considered out of context with the others. This approach did have shortcomings since students are composed of a complex of many interrelated variables, each having an effect on his behavior. For this reason the multivariate approach used in the remainder of this chapter has more validity.

Linear Regression Analyses Related to Academic Success

Stepwise multiple linear regression analyses were conducted to identify characteristics significantly influencing academic success and to construct a prediction equation for potential academic success.

Independent variables entering the linear regression analysis with a Student's t value above the 90 percent level of confidence were considered to significantly influence the dependent variable, utilization of training.

The R-square referred to in this discussion was the index of multiple correlation used in the linear regression analysis. The higher the linear relationship between the independent and dependent variables the higher the R-square coefficient, 1.00 indicating that all the variability in the dependent variable was explained by the independent variables, 0.00 indicating that none of the variability in the dependent variable was explained by independent variables.

Summary of Linear Regression Analyses Completed to Determine Variables Significantly Related to Academic Success

Academic success ratings, G.P.A., were available for all students in the sample therefore only 16 individuals out of the total 146 in the sample were deleted from these analyses due to missing data. The first analyses was conducted using academic success as the dependent variable and all other variables as independent variables. Three of the final variables entering the analysis had to be deleted because of singular matrix problems which halted the computation. These variables were: attendance at Fresno State College, engineering major and presence of a trained evaluator. Those variables would have caused only minor R-square changes and would not have shown significant Student's t values since they were the final variables entering the regression analyses. Table 5 summarizes the results

of this first analysis and lists all those variables having a Student's t value above the 80 percent level of confidence.

Table 5. Summary of Data from First Regression Analysis Completed to Determine Variables Significantly Related to Academic Success.

df = 85 R-square = .719

Code No.	Variable	Student's t value
3	return-home	-2.804*
11	California State College, Long Beach	-1.684*
12	Cal. Poly, San Luis Obispo	-1.668*
17	average English grade	1.302
23	time in U. S.	-1.670*
27	education major	1.558
28	other major	1.930*
30	sex (female)	-1.304
40	J visa	-1.621*
41	F visa	-1.709*
45	vacations spent in Latin America	2.339*
46	orientation program available	1.960*

*Student's t value above 90 percent level of confidence (1.600)

This first analysis eliminated many of the original independent variables from consideration as being significant contributors to academic success. Because of the relatively large number of variables in the first analysis as compared to the sample size of 130, it was suggested by the statistics consultant that a second regression be completed, using only those variables reported in Table 5, to determine if there would be any change in significance using a smaller number of variables. Table 6 presents the results of this second regression analysis completed to validate the first analysis.

Table 6. Summary of Data from Second Regression Analysis Completed to Determine Variables Significantly Related to Academic Success.

df = 128 R-square = .508

Code No.	Variable	Student's t value
3	return-home	-2.030*
11	California State College, Long Beach	-3.395*
12	Cal. Poly, San Luis Obispo	-2.277*
17	average English grade	3.106*
23	time in U. S.	-1.659*
27	education major	4.372*
28	other major	2.565*
30	sex (female)	-1.511
40	J visa	-.839
41	F visa	-2.218*
45	vacations spent in Latin America	1.651*
46	orientation program available	1.365

*Student's t value above the 90 percent level of confidence (1.600)

The limitation of the second regression analysis to 12 independent variables lowered the R-square value a considerable amount from that found in the first analysis, from .719 to .508, and produced some change in significance as was noted in comparing Table 5 and Table 6. A general rise in significance values was noted in the second analysis. The average English grade became significant at the 90 percent level of confidence as did involvement in education as a major. The availability of an orientation program became insignificant at the 90 percent level of confidence. The negative Student's t values, are reflected in the coding system. For example in variable 23, time in the U. S., the minus sign implied that the longer a student was in the U. S. the lower his academic success score would be.

Summary of Linear Regression Analyses Completed to Obtain Regression Coefficients Used to Construct a Prediction Model for Academic Success

Certain variables were deleted from these analyses since they would not be available at the time a student applied for admission. The independent variables included in the initial analysis used to construct the model prediction equation for academic success were: area of origin, college, level of training, previous college training, age, major, sex, marital status, prior employment, urban or rural background, source of financing, visa type, father's occupation, availability of orientation and trained transcript evaluators and source of high school training. The number of students included in this analysis was 142.

Five successive regression analyses were completed to determine which variables were significant above the 90 percent level of confidence and could be used to construct a model prediction equation. The results of the final analysis listing those variables having significance above the 90 percent level of confidence are shown in Table 7.

Table 7. Summary of Data from Final Regression Analysis Used to Construct a Model Prediction Equation for Academic Success.
Constant = 2.152 df = 135 R-square = .451

Code No.		Student's t value	Regression Coefficient
8	San Francisco State	2.065	.192
11	California State College, Long Beach	-2.968	-.332
12	Cal. Poly, San Luis Obispo	-2.473	-.238
22	age	2.277	.001
27	education major	6.380	.724
28	other major	3.977	.355

Legend for Prediction Equation. The following legend was established for the prediction equation:

1. application for admission to San Francisco State College — no = 0, yes = 1
2. application for admission to California State College, Long Beach — no = 0, yes = 1
3. application for admission to California State Polytechnic College, San Luis Obispo — no = 0, yes = 1
4. age, in months
5. application for education major — no = 0, yes = 1
6. application for major other than agriculture, engineering, business or education — no = 0, yes = 1
7. y = estimate of final grade point average (academic success)

Prediction Equation. $y = 2.152 + .192$ (San Francisco State) - .332 (California State College, Long Beach) - .238 (Cal. Poly, S. L. O.) + .001 (age) + .724 (education major) + .355 (other major).

The prediction equation would be used directly to predict potential academic achievement of applicants by substituting values corresponding to the six variables. For example, if a 30 year old applicant applied for admission to San Francisco State College in an education major the equation would be:

$$y = 2.152 + .192(1) - .332(0) - .238(0) + .001(360) + .724(1) + .355(0)$$

academic success predicted (GPA) = 3.428

It was noted that the equation contained only six of the original variables included in the analyses and as such the validity of the model could be questioned. The six variables incorporated into this formula produce an R-square value of .451 which indicated that only 45 percent of the variability in academic success (GPA) was accounted for by using the formula. This formula is only applicable under the limitations imposed on this study including areas of origin and the majors and colleges considered in the analysis.

Linear Regression Analyses Related to Utilization of Training

Stepwise multiple linear regression analyses were conducted to identify characteristics significantly influencing utilization of training

and to construct a prediction equation of potential utilization of training.

Summary of Linear Regression Analyses Completed to Determine Variables Significantly Related to Utilization of Training

Information for all variables was not obtained for all students in the sample. The major problem encountered was in obtaining a basis for the rating for utilization of training. For this reason 45 students (31%) of the total 146 students were deleted from the analysis.

The first analysis was conducted using utilization of training as the dependent variable and all other variables as independent variables. The final three independent variables entering the analysis were deleted because they created a singular matrix and halted the computation. These three variables: attendance at San Jose State College, agriculture major, and presence of a trained transcript evaluator, would have caused only minor R-square changes and would not have shown significant Student's t values because they were the final variables entering the stepwise regression analysis. Table 8 summarizes data obtained in this first analysis and lists all those variables having a Student's t value above the 80 percent level of confidence.

Table 8. Summary of Data from First Regression Analysis Completed to Determine Variables Significantly Related to Utilization of Training.

df = 52 R-square = .679

Code No.	Variable	Student's t value
13	Cal. Poly., San Luis Obispo	1.403
15	bachelor's degree	1.292
21	prior college training in native country	1.566
22	age	-2.556*
25	engineering major	2.304*
27	education major	1.609
30	sex (female)	1.413
32	marriage during training	-1.561
37	family financing	-1.869*
38	personal financing	-2.007*
39	scholarship financing	-1.858*
42	father's occupation similar	2.406*
43	follow-up contact after graduation	-2.429*
44	contact with Latin America while training	2.850*
48	Latin America high school	3.031*
49	present employment at higher level	2.887*

* Student's t value above 90 percent level of confidence (1.600)

** The negative Student's t values are reflected in the coding system. For example in variable 32, marriage during training, the minus sign implied that becoming married during training was negatively correlated with utilization of training.

The first analysis eliminated many of the independent variables from consideration as being significant contributors to utilization of training. Because of the relatively large number of variables in this first analysis as compared to the sample size of 101 it was recommended by the statistics consultant that a second regression analysis be completed, using only those variables reported in Table 8, to determine if there would be any change in significance using a smaller

number of variables. In addition variable 24, agriculture major, was included to determine if it had any significance since it was deleted from the first regression analysis. Table 9 presents a summary of the second regression analysis.

Table 9. Summary of Data from Second Regression Analysis Completed to Determine Variables Significantly Related to Utilization of Training.

df = 80 R-square = .521

Code No.	Variable	Student's t value
13	Cal. Poly, San Luis Obispo	1.424
15	bachelor's degree	1.970*
21	prior college training in native country	1.526
22	age	-2.201*
24	agriculture major	-.866
25	engineering major	1.802*
27	education major	1.065
30	sex (female)	1.206
32	marriage during training	-2.030*
37	family financing	-2.237*
38	personal financing	-2.430*
39	scholarship financing	-1.779*
42	father's occupation similar	2.131*
43	follow-up contact after graduation	-1.752*
44	contact with Latin America while training	2.652*
48	Latin America high school	3.420*
49	present employment at higher level	3.129*

* Student's t value above 90 percent level of confidence (1.600)

Some shifts in significance levels were noted using the smaller number of variables in the second regression analysis. Training at the bachelor's degree level became significant at the 90 percent level of confidence as did marriage during training. The reduction in the

R-square value from .679 in the first analysis to .527 in the second was only moderate considering that 32 of the original independent variables were dropped from the second analysis. Variable 24, agriculture major, which was added to the second regression to check the validity of the assumption that it would not be significant, showed an insignificant Student's t value at the 90 percent level of confidence in the second analysis.

Summary of Linear Regression Analyses Completed to Obtain Regression Coefficients Used to Construct a Prediction Model for Utilization of Training

Information on some variables, mainly utilization of training ratings, were not available on part of the sample. As a result 45 out of the total sample of 146 were deleted from this analysis. In addition several variables were deleted because they would not be available to a college at the time a student applied for admission therefore their inclusion in a prediction model was unwarranted.

The following variables were included in the initial analysis used to construct the prediction model: area of origin, college, level of training, previous college training, age, major, sex, marital status, prior employment, urban or rural background, source of financing, visa type, father's occupation, availability of orientation, and trained transcript evaluators and source of high school training.

Six successive regression analyses were completed on these variables to eliminate those not significant above the 90 percent level of confidence and to determine which variables could be used to construct a model prediction equation. The results of the final analysis listing those variables having significance above the 90 percent level of confidence are shown in Table 10.

Table 10. Summary of Data from Final Regression Analysis Used to Construct a Model Prediction Equation for Utilization of Training.
Constant = 62.400 df = 96 R-square = .320

Code No.		Student's t value	Regression Coefficient
10	Fresno State	-4.962	-35.072
33	prior employment in field	2.486	14.140
42	father's occupation similar	2.713	15.436
46	orientation program available	1.772	10.670

Legend for Prediction Equation. The following legend was established for the prediction equation:

1. application for admission at Fresno State College — no = 0, yes = 1
2. prior employment in field of specialization — no = 0, yes = 1
3. father's occupation similar to major requested — no = 0, yes = 1
4. orientation program available — no = 0, yes = 1
5. y = estimate of final utilization of training in percent

Prediction Equation. $y = 62.400 - 35.072$ (Fresno State) + 14.140 (prior employment) + 15.436 (father's occupation) + 10.670 (orientation).

The prediction equation would be used directly for predicting utilization of training of applicants by substituting values corresponding to the four variables. For example if an applicant applied to enter San Jose State College, had prior employment in his major field, his father's occupation was similar to his major and the college did not provide an orientation program the equation would be:

$$y = 62.40 - 35.072(0) + 14.140(1) +$$

$$15.436(1) + 10.670(0)$$

utilization of training predicted = 91.976 percent

It was noted that the equation contained only four of the original variables included in the analysis and as such the validity of the model could be questioned. The R-square value of the prediction equation was .320 which indicated the four variables accounted for one-third of the variability in utilization of training. In addition this equation is only applicable in situations involving similar conditions as encountered in this study including areas or origin, majors and colleges involved.

Discriminant Analysis as Applied to the Return, Non-Return Groups

This multivariate approach was selected to analyze the third dependent variable, return or non-return, included in the study. Since this variable had no scale of value similar to the previous two dependent variables analyzed, utilization of training and academic success, the regression technique previously used did not apply.

The discriminant analysis used in this portion of the study tested the null hypothesis that the means of the returning and non-returning group, in respect to the selected independent variables, were not significantly different. The test statistic used was the F ratio at the .1 level (90 percent level of confidence). The discriminant analysis also directed the computation of a set of linear functions which, if the null hypothesis was not accepted, could have been used to classify an individual into the returning or non-returning group.

The computer analysis used was limited to the inclusion of 20 independent variables and the one dependent variable, return or non-return.

Results of the First Discriminant Analysis

The first analysis included 20 independent variables identified by the review of literature as being significant to return or non-return. These variables were: level of training, previous college in

native country, time in the U. S. before graduation, area of specialization, marital status, prior employment in field, source of financing, type of visa, contact with Latin America while training and where vacations spent. The sample size was 98 students.

Appendix C includes the results of the analysis, listing the variables and the discriminant functions for each. The computed F value of .402 was less than the table value of 1.54 at the .10 level (90 percent level of confidence). On this basis the null hypothesis, that the group means were not significantly different, was retained and no further efforts were made to use the linear functions created to predict return.

Results of the Second Discriminant Analysis

The second analysis was completed using only those 20 variables identified as important by the review of literature and available in respect to return-home at the time the student applied for admission. The variables included in this analysis were: area of origin, level of training, previous college in native country, major applied for, sex, prior employment, source of financing, J visa and father's occupation. The sample size was 98 students.

Appendix C includes the results of the analysis. The computed F-value of .18 was once again less than the table value of 1.54 at the .10 level (90 percent level of confidence). On this basis the null

hypothesis, that the means of the returning and non-returning groups were not significantly different, was retained.

Results of the Third Discriminant Analysis

Although the null hypothesis was not rejected in the first two analyses it was noted, in observing the discriminant functions calculated in both prior analyses, the five variables related to area of specialization indicated a consistently high effect on the dependent variable, return or non-return. On this basis a third discriminant function was completed using these five variables as independent variables. Table 11 summarizes the discriminant functions produced in this analysis.

Table 11. Summary of Discriminant Functions for the Third Discriminant Analysis.

Roots = .163

Code No.	Variable	Discriminant Function
24	agriculture major	66.011
25	engineering major	65.835
26	business major	65.820
27	education major	65.860
28	other major	65.693

Again the computed F-value of .010 was less than the table value of 1.95 at the .10 level (90 percent level of confidence) and the null

hypothesis, that the returning and non-returning group were not significantly different, was retained.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The Problem

The purpose of this study was to (1) identify the characteristics of Latin American students who have graduated from the California State College system (2) to identify those characteristics which significantly affect academic success, utilization of training and return home and (3) to develop a model for prediction of academic success, utilization of training and return home.

Procedures

Stepwise multiple linear regression analyses were conducted to identify those characteristics contributing significantly to academic success and utilization of training and to construct production models for academic success and utilization of training. Discriminant analyses were conducted to determine if there were significant differences between the returning and non-returning groups of students and to develop a model for prediction of return home.

Summary of Findings

The summary of findings is presented in five parts. The first part summarizes the general characteristics of the students in the sample. The second part summarizes the results of the correlation

matrix created by comparing all independent variables with the three dependent variables, academic success, utilization of training and return home. The third part summarizes the results of the linear regression analyses related to academic success and the fourth part the results of the linear regression analyses related to utilization of training. The fifth and final part summarizes the results of the discriminant analyses completed to determine if there was any significant difference between the returning and non-returning group of students.

Summary of General Characteristics

A typical student included in the sample was 24 years old, male, unmarried, had an urban background and depended upon his family for financial support.

Almost half of the students, 49 percent, were from South America while a smaller number, 25 percent, were from Central America. Approximately 25 attended each of the six colleges included in the sample. In proportion to the total size of the student body the greatest concentration of Latins were at the California State Polytechnic Colleges of Pomona and San Luis Obispo. The majority of the students obtained bachelor's degrees in the fields of agriculture and engineering and had two years of previous college training, one in their native country and one in the U. S. The students were in the U. S. an average of 55 months before they completed their training.

Nearly half the students had prior employment in their field of specialization and one-third were trained in a field similar to the occupation in which their father was engaged. Eighty seven percent of those having prior employment in their field of specialization had obtained positions at a higher level of responsibility following their graduation.

The average utilization of training was 72 percent, average grade point score 2.67 and overall return rate was 61 percent. Thirty-seven percent of the graduates had some type of contact with the college following their graduation. Approximately half had some contact with Latin America regarding employment while they were training in the U. S. and about the same number spent some time in Latin America during their training period. Thirty-six percent of the students had access to formal orientation programs before they began their training and one college employed evaluators, admission officers, having formal training in the evaluation of Latin American applications. Seventy-nine percent of the students had an F visa.

Summary of Correlation Matrix

The correlation among the three dependent variables was:

1. utilization of training - academic success, .080
2. utilization of training - return home, .189
3. academic success - return home, .077

Six independent variables were identified as being correlated above the .40 level with the dependent variable academic success. These were: training at the bachelor's degree level (-.466), training at the graduate level (.612), average English grade (.447), previous college training in native country (.412), involvement in an education major (.520), and scholarship financing (.428). The significance of two of the variables, English grade and education major, was substantiated by the linear regression analyses related to academic success.

No variables were identified that correlated above the .40 level with the dependent variable, utilization of training. This was in contrast with the 12 variables determined to be significant in the linear regression analyses related to utilization of training.

Only two variables correlated with the dependent variable, return home, at a level above .40. These variables were: contact with Latin America during training period (.572) and vacations spent in Latin America (.559). The multivariate discriminant analysis did not indicate that these variables were significant.

It was emphasized that the correlation analysis did not indicate causality but rather a limited linear relationship. Each variable was correlated individually with each other variable. Since students had a number of background characteristics in combination the predictive value of one positively correlated characteristic could be questioned

if the type of student concerned consistently had a characteristic with a similarly high negative correlation. For example, as was found in the correlation for academic success, if students completing bachelor's degrees (-.466) had a consistently high degree of previous college training in their native country (.412) the correlations would not have any predictive significance since they would in effect cancel each other. The multiple regression analyses summarized in the two following sections attempted to overcome this problem by looking at the students background as a whole rather than as a part.

Summary of Linear Regression Analyses Related to Academic Success

Two regression analyses were completed to identify variables contributing significantly (above the 90 percent level of confidence) to academic success. The first analysis was completed to eliminate those variables having little or no significance (below the 80 percent level of confidence). The second analysis, completed to validate the first analysis, included only those variables identified as significant in the first analysis. The second analysis identified the following variables as significantly contributing to academic success (above the 90 percent level of confidence).

1. Return home. Graduates returning home (61 percent) tended to have had less academic success than those staying in the

U. S. This may have been related to the fact that many of those remaining in the U. S. had previous contact with the U. S. before they began their training. As such they may have had some familiarity with the culture and some knowledge of the English language which was found to be one of the most significant factors in predicting academic success.

2. California State College, Long Beach and California State Polytechnic College, San Luis Obispo. Graduates from these two colleges (29 percent) tended to have had less academic success than graduates from the other colleges. Very little commonality peculiar to these two institutions could be identified. The majority of technician graduates did come from California State Polytechnic College, San Luis Obispo and they did have a lower GPA (2.24) as compared to the average GPA (2.67) of all students included in this study. No such trend could be identified at Long Beach State College.
3. Average English grade. The higher a graduates English grades were the higher his academic success was. This was one of the strongest predictors of academic success and tended to substantiate the findings indicated in the review of literature.
4. Time in the U. S. The longer a student took to graduate the lower his academic success score tended to be.

5. Education major. Graduates from education majors tended to have higher academic success scores than those not graduating from education majors. This may have been related to the fact that a higher percentage of these graduates had completed graduate degrees (71 percent), had prior college training in their native country (30 months) and had scholarship financing (90 percent) as compared to graduates from other majors.
6. Other major. Graduates from majors other than agriculture, engineering, business and education (21 percent) tended to have higher academic success scores. These other majors were primarily of a liberal arts orientation.
7. F visa. Graduates having had F visas while in the U. S. (79 percent) tended to have lower academic success scores than those not having F visas (primarily J visas). The F visa was the primary student visa while the J visa included a provision that the student had to leave the U. S. for two years following the completion of his training.
8. Vacations in Latin America. Graduates who spent some vacation time in Latin America during their training period (56 percent) tended to have higher academic success than those who did not.

In summary only one of the variables, English language competency, identified in the review of literature as significant to the prediction of academic success was found to be significant in this study. All other variables found to be significant in this study including: return home, college of graduation, time in the U. S., major, visa type and place where vacations were spent, were not mentioned in the review of literature.

An equation was constructed for predicting academic success. The equation included variables, available at the time a student applied for admission, that were identified as being significant at the .10 level (90 percent level of confidence). The variables employed in the prediction equation were: application for admission to San Francisco State College, California State College - Long Beach, California State Polytechnic College - San Luis Obispo, age, application for admission to an education major or a major other than education, business, engineering or agriculture. It was noted that two of the variables, San Francisco State College and age were not identified as being significant predictors of achievement in the preceding analysis. This was due to the fact that the preceding analysis included all 49 variables in the study in contrast the 35 selected variables included in this analysis of academic success. Due to this fact and relatively low R-square value of .451 for the prediction equation it was recommended that the equation be validated before being used.

Summary of Linear Regression Analyses Related to Utilization of Training

Two regression analyses were completed to identify variables contributing significantly (above the 90 percent level of confidence) to utilization of training. The first analysis was completed to eliminate those variables having little or no significance (below the 80 percent level of confidence). The second analysis, completed to clarify and validate the first analysis, included only those variables identified as significant in the first analysis. The second analysis identified the following variables as significantly contributing to utilization of training (above the 90 percent level of confidence).

1. Bachelor's degree training. Graduates completing a bachelor's degree (76 percent of the sample) showed a greater tendency to use their training than did graduates completing training at the technician or graduate level. This tended to substantiate previous research findings that high level specialized training at the graduate level was not very useful. In addition it was noted that technician training, at less than a baccalaureate level, was not significantly related to utilization of training. This was possibly accounted for in that almost all technician training was completed in the agriculture majors. The majority of graduates from

these majors, two thirds, went into some form of supervisory employment. This factor may raise some question as to the content of training programs in the field of agriculture.

2. Age. Younger graduates used their training to a greater degree than did older graduates.

3. Engineering major. Those students graduating from an engineering major (25 percent) tended to use their training to a greater degree than those graduating from other fields. Even though the graduates from this major had significantly higher utilization of training scores than of other majors, it was noted that their return rate was 50 percent, one of the lowest. The decision to emphasize this major should be considered in view of this factor. It was noted that graduation from an agriculture major was <u>not</u> significantly related to utilization of training. This factor may have been related to the high amount of supervisory employment previously mentioned.

4. Marriage during training. Graduates who married during their training period tended to have lower utilization of training than those who did not marry during training. It was noted that those marrying during their training period, 18 percent, tended to stay in the U. S. and as a result may

have had difficulty using their training because of the problem of competing in the U. S. labor market.

5. Financial support. All three types of financial support: family, personal and scholarship showed a significant negative correlation with utilization of training. The significance found here indicated that a high concentration of support in any one area tended to lower utilization of training. This factor was not mentioned as being significant in the review of literature.

6. Father's occupation. Graduates from majors similar to the field of employment of their father tended to make better use of their training than graduates who were trained in fields different from their father's occupation. This tended to substantiate the finding of previous studies that sponsorship and support were important factors in utilization of training.

7. Follow-up contacts after graduation. Graduates having follow-up contacts with their college after graduation (38 percent) tended to have lower utilization of training scores than those having no contacts. This did not coincide with the findings of previous research. The difference possibly being that the major type of contact encountered in this study was not of the supportive type but rather of a general

correspondence nature and in several cases was involved with helping the student return to the college or the U. S. because he was unhappy with his present position. It was suggested that future studies should subdivide this variable for a more meaningful analysis.

8. Contact with Latin America while training. Graduates who had contact with Latin America while training (49 percent) tended to have higher utilization of training scores than those having no contact. This tended to substantiate the findings of previous research regarding the importance of focusing the application of training on the needs in the home country and having support in the native country.

9. Latin America high school. Graduates who had Latin American high school training (86 percent) tended to have higher utilization of training scores than those having high school training outside Latin America.

10. Present employment at a higher level. Graduates reporting employment at a higher level of responsibility than employment previous to training showed a tendency to have higher utilization of training scores than those working at employment levels similar to employment before training. This substantiated findings of previous research relating to utilization of training, social status and prior employment.

In summary all variables identified in the review of literature as significant predictors of utilization of training with the exception of: the amount of leadership training, sex and length of stay in the U. S. were found to be significant in this study. In addition two variables, not identified in the review of literature, were identified as being significant in this study. These were financial support and location of high school training.

An equation was constructed for predicting utilization of training. This equation included variables, available to the college at the time a student applied for admission, that were identified as being significant at the .10 level (90 percent level of confidence). The variables employed in the construction of the prediction equation were: application for admission at Fresno State College, prior employment in field of major applied for, father's occupation and availability of an orientation program. It was noted that these variables, with the exception of "father's occupation" were not identified as being significant predictors of utilization of training in the preceding analysis. This was due to the fact that the preceeding analysis included all variables in the study in contrast to the selected variables included in this analysis of utilization of training. Due to this fact and the low R-square value of .320 for the prediction equation it was recommended that the equation be validated before being used.

Summary of Discriminant Analyses Related to Return or Non-Return

The purpose of the discriminant analyses were to test the null hypothesis that the mean scores of the returning and non-returning students, in relation to 20 selected variables, were not significantly different. If the null hypothesis was rejected a linear function was to be calculated, using significant variables, to construct a prediction model for return or non-return.

Three discriminant analyses were conducted using different variables as identified by the review of literature. The null hypothesis was not rejected at the .10 level therefore it was not possible to construct a valid prediction model for return or non-return. On the basis of the data in this study, the significance of the variables identified by the review of literature could not be substantiated. A subjective analysis of the data determined no pattern of variables contributing to return or non-return. Several special situations including marriage, financial problems, political pressures and family bereavement were identified which had a definite effect on return. When these situations developed they tended to overshadow all other factors. These situations did not appear frequently enough nor were they defined sufficiently in this study to achieve any statistical significance.

Conclusions

The following conclusions were derived from this study:

1. There were certain characteristics significantly affecting student academic success and utilization of training.

2. There was little correlation between academic success and utilization of training and the characteristics (variables) affecting academic success and utilization of training were different.

3. There were characteristics which could be used to construct prediction equations for academic success and utilization of training.

4. There was no significant difference between the returning and non-returning group of graduates, therefore a prediction model for return home could not be constructed.

Recommendations for Admission of Latin American Students and for Developing Programs for these Students in the California State College System

The following recommendations were made to those administering foreign student programs in the California State College system. The recommendations were made to enhance the ability of future Latin American students to achieve academic success and utilization of training. It was recommended that:

1. Evaluators and admissions officers at the colleges concerned be provided with inservice training so their ability to screen and advise

applicants could be enhanced based upon the summary and conclusions of this study.

2. Foreign student advisors be made aware of the characteristics, identified in this study, as significantly affecting academic success and utilization of training in order that their ability to counsel and advise students could be enhanced.

3. The prediction equations be validated to obtain an estimate on their degree of accuracy.

4. The J visa requirement at California State College - Long Beach be eliminated since it did not contribute significantly to the return home rate.

5. The Test of English as a Foreign Language (TOEFL) be made a prerequisite for admission for Latin American foreign students and that remedial help be provided as needed.

Recommendations for Further Study

The following recommendations were made for further study of foreign student programs in the California State College system as a result of this investigation. It was recommended that:

1. An ongoing standardized program of data collection be established, beginning from the time a student entered college, so that further studies done to evaluate the effectiveness of foreign student programs could be completed with more precision and less

difficulty.

2. An ongoing program of follow-up be established to determine utilization of training in order to evaluate the success of the foreign student program. This need was emphasized by the lack of a relationship between academic success and utilization of training shown in this study.

3. Additional study be completed to determine factors significantly related to return or non-return.

4. An analysis be made of the type of curriculum provided for agriculture majors in relation to their future employment. It was noted that graduates in this field often reported supervisory employment while their training was heavily technical in nature, which resulted in low utilization of training scores.

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APPENDICES

QUESTIONNAIRE

(If possible please return no later than February 15, 1972)

A. Instructions

1. Please write out or circle the appropriate response.
2. Please answer the question as clearly and honestly as possible.
3. Please do not skip any question.

B. Questions

1. What is your job title? _____

2. Give a short description of your job. Please specify exact duties such as: supervision of specific types of personnel; training of personnel; construction, operation or maintenance of specific items or consultation on specific projects. In addition please give an approximate percentage of time you spend on each of the specific duties you have listed in your job description.

_____

_____

_____

_____

_____

3. What percentage of your U.S. training do you use in your present job? _____%

4. What type of employment, if any, did you have before you came to the U.S. to study?

   a. had employment related to field of study, type of employment _____
   b. had employment unrelated to field of study, type of employment _____
   c. had no significant employment prior to study in the U.S.

5. If you had employment prior to your study in the U.S. do you feel your present employment is:

   a. at a lower level of responsibility?
   b. at a similar level of responsibility?
   c. at a higher level of responsibility?

6. Were you employed at any time while studying in the U.S.?

   a. yes
   b. no

7. If "yes" to the previous question (6), was your employment related to your field of study?

   a. yes
   b. no

8. If your fathers occupation related to your field of study?

   a. yes
   b. no

9. What was your primary form of residence while you were studying in the U.S.?

   a. dormitory (residence hall)
   b. private apartment
   c. other, specify _____

(SEE BACK OF SHEET)

10. What was your primary form of financial support while you were studying in the U.S.?

    a. family support
    b. personal support (self-support)
    c. scholarships and grants, source _____
    d. other source, specify _____

11. What visa type did you have while you were studying in the U.S.?

    a. J visa - exchange visitor
    b. F visa - student
    c. other, specify type _____

12. Did you participate in a formal orientation program prior to your course of study?

    a. yes, specify type _____
    b. no

13. What type of secondary education did you receive?

    a. Bachillerato
    b. Tecnico
    c. Comercial
    d. Magisterio
    e. U.S. schooling
    f. other, specify type _____

14. While you were studying in the U.S. did you have any contact with your native country regarding employment opportunities at home?

    a. yes, specify type of contact _____
    b. no

15. Have you had any follow-up contacts from your college since you graduated?

    a. yes, specify type of contact _____
    b. no

16. Were you involved in the "host family" program at your college?

    a. yes
    b. no

17. Where did you usually spend your vacations while you were studying in the U.S.?

    a. in Latin America
    b. other, specify where _____

18. What is your original home background?

    a. rural
    b. urban

19. Would you be willing to meet with a representative of the California State College system to discuss in more detail the problems encountered by Latin American students studying in the U.S. if such a person were to visit Latin America in the coming year?

    a. yes
    b. no

20. If "yes" to the previous question (19), please indicate where you should be contacted.

    Name _____, Address _____

    _____

C. Thank you for your cooperation. Please air mail this questionnaire to:

CALIFORNIA STATE POLYTECHNIC COLLEGE

January 27, 1972

Dear Alumnus:

I would like to request your assistance in providing information for a study of Latin American students who have graduated from the California State College System. This project is being completed with the cooperation of six of the colleges within the California State College System and the Office of the Chancellor.

The study is attempting to find out what factors contribute to or hinder: (1) academic success in the United States, (2) utilization of training, and (3) return to Latin America. The end result will be the development of training programs with increased relevance for Latin American students.

Your cooperation in completing this questionnaire will make a substantial contribution since we have no other means of finding out the information requested.

There are no right or wrong answers to the questions. The answers you give will not be disclosed to anyone. Your replies will be converted to code numbers and will be combined with others for tabulation by IBM machines and analysis by groups. You will not be identified by name in any way. The completed questionnaire itself will become the property of the California State College System, to insure that its confidential nature is maintained.

The instructions for the questionnaire are simple and are written at the top of the questionnaire itself. We appreciate your cooperation in helping us conduct this study which we hope will contribute to the improvement of our training programs and the utilization of the training in your country.

Sincerely,

Redacted for privacy

John R. Berne
Foreign Student Advisor

JB:jh
Enclosure

CALIFORNIA STATE POLYTECHNIC COLLEGE

Dear Alumnus:

Several weeks ago you were forwarded a short questionnaire regarding the nature of your training and your present employment. I would appreciate it greatly if you could return the questionnaire to me via airmail in the enclosed envelope as soon as possible. I appreciate your consideration and cooperation in helping the California State College System attempt to re-evaluate and improve its relations with Latin American students.

Please disregard this letter if you have already mailed the questionnaire.

Yours sincerely,

Redacted for privacy

John R. Berne
Foreign Student Advisor

JB:jh
Enclosure

APPENDIX B

Coded Variables Used in Study

Code Number	Variable	Code
1	Utilization of Training	000 - 100%
2	Academic Success (GPA)	0 - 4
3	Return Home	0 - 1, (no - yes)
	Home Country	
4	Central America	0 - 1, (no - yes)
5	South America	0 - 1, (no - yes)
6	Caribbean	0 - 1, (no - yes)
7	Mexico	0 - 1, (no - yes)
	College of Graduation	
8	San Francisco State College (SFSC)	0 - 1, (no - yes)
9	San Jose State College (SFSC)	0 - 1, (no - yes)
10	Fresno State College (FSC)	0 - 1, (no - yes)
11	California State College, Long Beach (CSCLB)	0 - 1, (no - yes)
12	California State Polytechnic College, Pomona (CP-PO)	0 - 1, (no - yes)
13	California State Polytechnic College, San Luis Obispo (CP-SLO)	0 - 1, (no - yes)
	Level of Training	
14	Technician	0 - 1, (no - yes)
15	Bachelor Degree	0 - 1, (no - yes)
16	Graduate Degree	0 - 1, (no - yes)
17	Average English Grade	0.0 - 4.0
18	Laboratory or Activity course hours	00 - 99%
19	Leadership course hours	00 - 99%

Code Number	Variable	Code
	Previous college training	
20	U. S. college	00 - 99, months
21	Native country college	00 - 99, months
22	Age	000 - 999, months
23	Time in U. S. before graduation	000 - 999, months
	Area of Specialization (major)	
24	Agriculture major	0 - 1, (no - yes)
25	Engineering major	0 - 1, (no - yes)
26	Business major	0 - 1, (no - yes)
27	Education major	0 - 1, (no - yes)
28	Other major	0 - 1, (no - yes)
29	Changes of major	0 - 9
30	Sex	0 - 1, (M - F)
31	Married before admission	0 - 1, (no - yes)
32	Married during training	0 - 1, (no - yes)
	Employment	
33	Prior employment in field of specialization	0 - 1, (no - yes)
34	Prior employment outside field	0 - 1, (no - yes)
35	Employment during training	0 - 1, (no - yes)
36	Urban background	0 - 1, (no - yes)
	Primary source of Financing	
37	Family	0 - 1, (no - yes)
38	Personal	0 - 1, (no - yes)
39	Scholarships	0 - 1, (no - yes)
	Visa type	
40	J visa	0 - 1, (no - yes)
41	F visa	0 - 1, (no - yes)
42	Fathers occupation similar	0 - 1, (no - yes)

Code No.	Variable	Code
43	Follow-up contact after graduation	0 - 1, (no - yes)
44	Contact with Latin America regarding employment while training	0 - 1, (no - yes)
45	Vacations spent in Latin America	0 - 1, (no - yes)
46	College provides foreign student Orientation Program	0 - 1, (no - yes)
47	College employs trained transcript evaluator	0 - 1, (no - yes)
48	Student had Latin American High School training	0 - 1, (no - yes)
49	Present employment at higher level than prior employment	0 - 1, (no - yes)

APPENDIX C

Discriminant Analysis Summary

Summary of First Discriminant Analysis

Roots = 1.698

Code No.	Variable	Discriminant Function
14	technician training	-.023
15	Bachelor's degree	-.001
16	graduate degree	.066
21	native country college	-.002
23	time in U. S.	.001
24	agriculture major	874.866
25	engineering major	874.948
26	business major	874.929
27	education major	875.101
28	other major	874.979
31	married before admission	.002
33	prior employment in field	-.009
37	family financing	.009
38	personal financing	-.011
39	scholarship financing	-.033
40	J visa	-.109
41	F visa	-.007
42	fathers occupation similar	-.012
44	contact with Latin America	-.103
45	vacations in Latin America	-.208

Summary of Second Discriminant Analysis

Roots = .708

Code No.		Discriminant Function
4	Central America	-.038
5	South America	-.020
6	Caribbean	-.043
7	Mexico	.109
14	technician training	.013
15	Bachelor's degree	.002
16	graduate training	-.022
21	native country college	-.002
24	agriculture major	72.737
25	engineering major	72.651
26	business major	72.646
27	education major	72.517
28	other major	72.582
31	married before admission	-.027
33	prior employment in field	.120
37	family financing	-.060
38	personal financing	-.038
39	scholarship financing	-.019
40	J visa	.067
42	fathers occupation	.095