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ABSTRACT

A field study to describe common characteristics of three "most successful" vocational programs in each participating northern California community college is presented. The study was divided into distinct phases. In Phase I, a procedure for identifying three "most successful" programs on each college campus was developed and implemented. In Phase II, characteristics of "successful" differences. The technique used in Phase I is the Delphi technique, which is a means of structuring communication to overcome these detrimental effects of open communication. Phase I began with a project planning conference whose primary objectives were to acquaint college representatives with the objectives of the study, to make necessary modifications in the plan, and to enlist local college support for the field study. In all cases, agreement between Delphi panels was sufficient to identify three programs which met the project definition of success. In Phase II of the study, a questionnaire was developed and administered in a standardized interview of first-line administrative personnel of successful and "other" vocational education programs. Hypotheses tested were: (1) Vocational programs identified by Delphi panels as most successful have common identifiable characteristics; and (2) Vocational programs identified by Delphi panels as most successful differ from "other" programs in program characteristics. The essential results of the Phase II questionnaire are shown in tabular form. (CK)

NOR CAL RESEARCH GROUP VOCATIONAL EDUCATION STUDY:

A FIELD STUDY TO DETERMINE CHARACTERISTICS OF MOST SUCCESSFUL VOCATIONAL EDUCATION PROGRAMS

conducted by

NORTHERN CALIFORNIA COMMUNITY COLLEGES RESEARCH GROUP

Mr. Walter Brooks, Chairman
(Shasta Community College)

Funded under

Title 1, Part C, Sec. 131(b) of Public Law 90-576

Project No. 28-66274-C065-72

September 30, 1972

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in

A FIELD STUDY TO DETERMINE CHARACTERISTICS OF
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DISTRICT SUPERINTENDENT-PRESIDENT GILBERT A. COLLYER

December 14, 1972

Mrs. Marcia A. Boyer
Acquisitions Specialist
Clearing House for Junior Colleges
96 Powell Library Building
Los Angeles, California 90024

Dear Mrs. Boyer:

In response to your letter of November 30 requesting information on funding of the research project, the project was undertaken with VEA Title 1, Part C research funds granted to Nor Cal by the California Community College Chancellor's Office. The exact project number is 28-66274-C065-72.

Sincerely,

Walter L. Brooks
Chairman
Nor Cal Research Group

WLB:rmt

PREFACE

Since we who participate in the Northern California Community College Research Group believe its activities are extremely important to our colleges, mention should be made of the nature of the organization at the outset of this report. The "Nor Cal" Research Group is an informal and voluntary association of community college educators who carry primary responsibility for, or maintain a strong interest in, the institutional research and development function of their college. The basic purposes of Nor Cal are to encourage cooperative research among colleges and to exchange information on research projects and innovative programs.

Although Nor Cal originated the idea for this project, it cannot claim it as its own. Support from the vocational education deans of our colleges, the California Community College Chancellor's Office, and the State Department of Education was essential to project development. The idea for this cooperative project came from one of the bi-monthly meetings of the Nor Cal Research Group at Cabrillo College in the spring of 1971. Lorine Aughinbaugh, Assistant Dean of Research from American River College, and I accepted the responsibility for developing a specific research plan and applying to the California Community College Chancellor's Office for VEA funding. At the next meeting of the organization at Solano Community College, the plan was presented to Nor Cal members and was adopted as a cooperative research project for the 1971-72 school year.

Upon application to the Chancellor's Office for funding, we were extremely fortunate in having Dr. Bill Morris, Consultant on Evaluation of Vocational Education for the Chancellor's Office, and Dr. Earnest Neasham, Educational Research Evaluation Consultant for the State Department of Education, review our proposal. Both saw merit in the proposal and helped us to clarify and sharpen our research design. Once the project was funded both agreed to sit on our Project Advisory Committee where they contributed greatly as individuals to the development of the project.

It was obvious to us at the outset that the project could never succeed without close cooperation of the vocational education deans of our member colleges. Mr. Lloyd Livingston of Shasta College, Dr. Louis Quint of American River College, and Dr. Harry Shortess from the Peralta Community College District Office consented to join our Project Advisory Committee.

These men were extremely helpful in enlisting the support of the vocational education deans of the participating colleges, but we depended on them more for their insight into vocational education programs and program management. All seven members of the Nor Cal Research Group Steering Committee served on the advisory committee. They were: Mrs. Lorine Aughinbaugh, Assistant Dean of Research, American River College: Dr. Dayton Axtell, Counselor and Psychometrist, Merritt College; Mr. Walter Brooks, Director of Research, Shasta College; Dr. Patricia Hertert, Instructional Resources Consultant, Yosemite Junior College District; Mrs. Virginia Murdoff, Dean of Students, Napa College; Dr. Paul Preising, Director of Institutional Research, San Jose City College; and Dr. Lance Rogers, Director of Center for Independent Learning, City College of San Francisco.

Napa College acted as the fiscal agent for the project and both Virginia Murdoff, Nor Cal Treasurer, and Andy Peterson, Napa College Business Manager, suffered graciously with the expense vouchers and requests for payment emanating from colleges all over the north state.

During the data collection phase of this project, Mr. Blaine Wishart served as project director. The extremely competent and thorough analysis of the data, which is reported in this study, is the work of Dr. Fred Dagenais of the Far West Laboratory for Educational Research and Development in Berkeley.

One of the most farsighted decisions of the advisory committee was to select Dr. Ben Gold, Director of Institutional Research at Los Angeles City College, as project auditor. Although Dr. Gold had never conducted an audit of an educational research project prior to this one, his approach to the task ought to serve as a model for those with extensive experience in the role who see themselves as project historians. Dr. Gold attended all key meetings and conferences for a firsthand look at what was occurring. He not only summarized and evaluated progress, his interim audit reports offered us specific, positive suggestions. His guidance often gave us our bearings and helped us to avoid the more monumental blunders we would have made without him.

Ultimately however, the project was not an individual accomplishment; it was undertaken as an extra job for almost everyone involved. No college representative was required to participate and few of those who did received more than their travel expenses for doing so. We began the project with the

hope that what we were doing was an important first step in developing management information for vocational educators, and with the certain knowledge that we must learn to learn from one another in community colleges if we are to be effective in our educational role.

A FIELD STUDY TO DETERMINE CHARACTERISTICS
OF MOST SUCCESSFUL VOCATIONAL EDUCATION PROGRAMS

Historically, California community colleges have controlled the development of their own vocational or occupational programs. A few programs must meet state standards for licensing but in most cases, colleges have been relatively free to initiate those programs which they choose to initiate. Curriculum, facilities, and instructional staff have been provided according to local standards and budgets. To say that community college administrators and boards of trustees prefer such an arrangement is probably a gross understatement; in fact, state-wide standards or policies are rarely adopted by community colleges without a protracted struggle.

California community colleges have guarded their local autonomy in the decision making process for a purpose. Externally imposed standards or guidelines are seen as a serious threat to the basic educational role of the community college. Most community college educators believe that the phenomenal success of the institution is based upon its ability to tailor policies and programs to fit local needs. This attitude of emphasizing community service while rejecting outside controls has undoubtedly contributed greatly to the emergence of the community college as a new form of higher education; but like all virtues, local control may have its negative sides. One of the negative aspects of this emphasis on local autonomy is that it may tend to make us more provincial in our outlook and less effective in program development than we might be.

Community colleges generally do a good job of meeting the needs within a district, but if published results of institutional research studies are a valid indicator, they are slow to share their own experience or profit by the experience of other colleges. An inspection of the information available through the ERIC system on all aspects of community college education will verify our lack of formal communication. Relatively few studies of significant aspects of educational programs or practices are initiated by the colleges themselves. This is especially true of studies which cross district boundaries. Most cooperative studies are undertaken by outside agencies or graduate students in search of a degree. This condition is as prevalent in vocational education as it is in other areas of community college education.

The number of vocational programs offered in California community colleges has increased two and one half times in the past seven years (4, 7:10-41), but very few realistic guides are available to the vocational administrator in developing new programs or modifying old ones. New programs are usually the private inspiration of a local vocational educator combined with ideas borrowed from similar programs offered by the nearest neighboring college; once begun, programs are rarely modified. This field study, cooperatively undertaken by northern California community college vocational administrators and research officers, is a first attempt to communicate more systematically about vocational programs and thereby improve existing management information.

PURPOSE OF THE STUDY

The specific intent of this field study was to describe common characteristics of three "most successful" vocational education programs in each participating northern California community college. It was felt that a careful analysis of the characteristics of each successful program would lead to the discovery of characteristics common to all successful programs and ultimately, meaningful management information for vocational administrators might be developed. When comparisons were made, successful programs were compared with "other" programs or programs in general which were not selected as successful. It is important to note that in no case were successful programs compared with unsuccessful. It is far more difficult to differentiate successful programs from programs in general than it is successful programs from unsuccessful. Differences which emerge in this kind of analysis are far more difficult to identify but are possibly more important than they would be if successful and unsuccessful were compared. The decision to concentrate upon characteristics of successful programs was partly a matter of expediency. With one year to complete the study, limitations had to be imposed upon the scope of the study. It was assumed that if a complete analysis of program characteristics was not possible that an emphasis on the analysis of successful programs would bear the greatest fruit.

The diplomatic implication of limiting the project to identification and analysis of successful programs was not ignored. To begin the project, it was necessary to solicit the cooperation of representatives from each of twenty independent California community colleges who would be called upon

to supply staff, time, and resources voluntarily. Obviously, in this sort of undertaking a positive approach to program analysis is unquestionably appropriate. The primary danger in such an approach, however, is that the reader will conclude that simply because a given characteristic did not distinguish successful programs, it was not necessary to success. Characteristics which were common to both successful and other programs might not stand out in this study; that is, those characteristics which were a necessary element of all programs would not be identified.

PLAN OF THE STUDY

This field study was divided into two distinct phases. In Phase I of the study, a procedure for identifying three "most successful" programs on each college campus was developed and implemented. In Phase II of the study, characteristics of "successful" and "other" vocational programs were described and analyzed for significant differences. An overview of the plan of the study is presented diagrammatically in Appendix 1.

PHASE I

Planning Conference

Phase I of the study began at Shasta College on October 29, 1971 with a project planning conference. The specific objectives and activities of the planning conference are shown in Appendix 2. The primary objectives of the conference were to acquaint college representatives with the objectives of the study, to make necessary modifications in the plan, and to enlist local college support for the field study.

Vocational Program Definition

In this study, a vocational program was defined as one which was listed in the college catalog as a vocational major and was designed primarily to give the student employable skills in a specified occupational area in two years or less. No stipulation was made with regard to standards to be met or degrees to be achieved. It was recognized that many college catalogs contained descriptions of vocational programs which were out of date or were not actually offered as a cohesive program. It was left to the discretion of the

vocational education dean from each participating college to submit a list of programs offered on his college campus which met the project definition.

Identifying Successful Vocational Programs

It was decided that each college would identify three most successful vocational education programs through a local panel of judges using a "Delphi" communication structure. In situations where no objective criteria are available, it has been found that opinions of individuals can be pooled to make better judgments than the same people would make individually or through traditional means of group discussion. Recent experiments by researchers at Rand Corporation in Santa Monica have combined certain principles of communication which are useful in situations where objective data is not available and judgments must be made on the basis of opinion. Collectively, these principles have come to be known as the Delphi technique. Even with the exotic name, however, Delphi depends upon well-known psychological principles rather than metaphysics for its accuracy. In essence, it is a way of searching out the opinion in a group which most closely approximates objective measures.

Employment of the Delphi technique in most cases requires no great technical skill. Although the specifics change from situation to situation, necessary instruments and procedures are usually uncomplicated. Participants are asked to state their opinion on a proposed question in writing. The opinion is given anonymously without consultation with other panelists. All statements are collected, duplicated, and a complete set of statements is returned to each member of the group for consideration. Participants are asked to indicate agreement or disagreement with the statements in some fashion. These responses are again collected, reproduced, and distributed to the total group. The process continues for a predetermined number of rounds or iterations, or until group consensus is reached upon the statements.

While on the surface the method is a seemingly circuitous means of arriving at a group judgment, it is intended to overcome some formidable obstacles usually present in open communication among group members. In open communication, especially face-to-face communication, several factors combine to distort opinion and reduce accuracy: statements of high status group members are likely to be viewed by other members as more important

or accurate than they really are. Dominant members of the group, those that like to express opinions and talk, are likely to affect group judgment out of proportion to the quality or accuracy of the contribution. In open communication, the individual quite often clings to and defends a public statement even against strong evidence that the initial opinion was in error. Once majority opinion is known in open communication, however, there is great pressure to accept the majority judgment regardless of accuracy. Finally, open communication usually involves a face-to-face encounter and requires an assembly of people in the same place at the same time.

The Delphi technique is a means of structuring communication to overcome these detrimental effects of open communication. It is a controlled process of interaction to make the most of group judgments. Delphi assumes that if initial opinions are expressed anonymously, there is less tendency to be affected by dominant or high status members of the group. Each member of the group is allowed to see how every other member reacts to statements without pressure from the majority, and with no public commitment of his own. It is assumed that under these circumstances the participant is in the best possible position to make a new judgment solely on the basis of the communication. Finally, but by no means least important in a practical sense, it is not necessary to have group members meet face to face in a Delphi exercise.

While questionnaires and response modes vary, certain key elements are common to all Delphi procedures. They are:

1. Anonymity of respondents
2. Iteration and controlled feedback of individual judgments to the entire panel
3. Grouping responses in describing panel consensus

Delphi Panels

At the fall planning conference, it was agreed that two panels would be selected on each college campus and would work independently at the task of identifying most successful programs. This was an innovation in Delphi methodology introduced during the project to include a reliability check on the work of the panels. The use of two independent panels was also critical to the project operational definition of program success.

Both the reliability check and the definition will be described in later sections.

An attempt was made to keep the panels comparable in their structure by including on both panels representatives from each of the following categories:

1. Dean of Instruction, Associate Dean of Instruction, or Dean of Guidance and Admissions
2. Member of College Board of Trustees or Member of Vocational Advisory Committee
3. Vocational Counselor
4. Academic Counselor
5. Instructor in Transfer Curriculum
6. Instructor in Vocational Curriculum
7. Classified Admissions Office Personnel
8. Two Students Enrolled in Vocational Programs
9. Two Students Enrolled in Transfer Programs

Where the organizational structure of the college did not agree with the categories indicated, substitutions were made which approximated the idealized panel. Where a participant in the category was unavailable, the same rule applied. Most colleges taking part in the process were able to meet the project requirements quite closely.

Delphi Instrument

The Delphi instrument used in Phase I of this project to identify most successful vocational programs is shown in Appendix 3. Initially, the two separate panels selected on each campus were asked to identify up to five vocational education programs offered by their colleges which they considered to be most successful, and to list reasons for their choice. A list of the vocational offerings which met the project definition was attached to the first round questionnaire. When first round questionnaires were returned, the name of each program indicated by panel participants was transfered to a separate sheet of paper. The percentage of participants choosing the program was shown at the top of the paper and all the reasons given for selecting the program were listed below it.

In the second round of the Delphi process, all sheets were clipped together. Instructions on the cover sheet asked the panel participants

to read what all other panelists had to say about programs selected and make a new judgment. This time panelists were asked to select three most successful programs instead of five. At the end of the second round, the results of the two panels, which were working independently to identify most successful programs, were compared. Successful programs were defined as the three commonly identified by both panels with the greatest percentage of agreement within the panel. If agreement between the two panels was low at this point, the second round was repeated showing new percentages of group response discarding from the list of programs those not selected on the second round. In most cases, however, agreement between the two panels even on the second round was very high. The second round questionnaire as it was returned by one of the colleges is shown in Appendix 3.

On the third round questionnaire, panelists were asked to rate the comments they and other panelists had made about programs. These ratings were made in terms of their relative importance to program success. The Round 3 questionnaire is shown in Appendix 3. Results from the Round 3 questionnaire were an important element in developing standardized interviews in Phase II of the project.

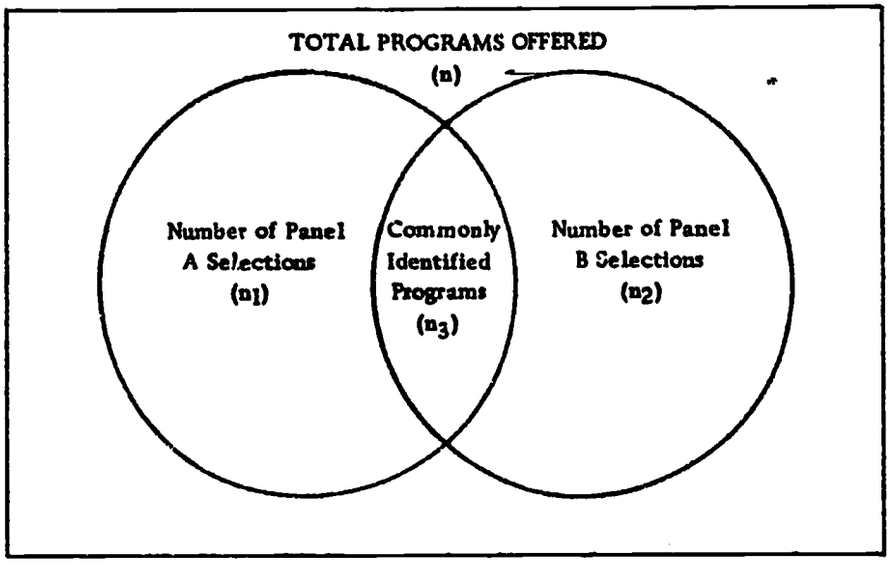
Panel Selection and Administration of the Questionnaire

Enlisting the cooperation of a broad cross section of people on each college campus who would be taking part in the Delphi panels was a most critical step in the first phase of the project. This was only possible with the cooperation of the vocational education dean and the research officer on each campus. It is probably important to point out here that the sole reason why cooperation was possible is that the field study grew out of the thinking and the concerns of those who carried it out. Most of those who cooperated had contributed something to the development of the study plan so that while they cooperated with other colleges, they were dealing with a locally originated study as well. In the first phase of the study, complete returns were obtained from 16 of the 21 participating colleges. In those cases where results were not complete, data collection problems encountered were beyond the control of the college representative.

Delphi Procedure Reliability

The division of the campus participants into two panels working independently to identify most successful programs made a most useful reliability check possible. The reader may recall that the vocational dean from each participating campus was asked to furnish a list of all vocational programs meeting the project definition. This list was attached to the Round 1 questionnaire in the Delphi process. It constituted a "universe" of choices for panel participants. For purposes of our reliability estimate, each of the two Delphi panels might be thought of as drawing an independent sample of choices from a known population of choices. If we know the universe of choices that are possible (number of vocational programs attached to the Round I questionnaire) and we also know the name and number of programs identified by each of the panels at the end of the second round in the Delphi process, the probability of two independent panels selecting the same vocational program from the universe of choices can be mathematically calculated. The reliability test might be best described with a hypothetical example.

Let us say that one of the two Delphi panels, Panel A, after the second round of the Delphi process has reduced the number of programs it identifies as most successful to 11. Assume further that the second panel, Panel B, working independently of the first panel, has reduced its choices of most successful programs to 9. Finally, let us assume that the two panels have commonly identified 6 vocational programs. This situation is shown diagrammatically below:



We can now calculate directly the probability of these two panels making a common choice of 6 programs from a universe of 30 possible choices with the mathematical formula shown below where: n = number of programs in the universe of choices; n_1 = number of programs finally selected by Panel A after two Delphi rounds; n_2 = number of programs selected by Panel B after two Delphi rounds; n_3 = number of programs the two panels have independently selected in common from the universe of choices.

$$P = \binom{n}{n_3} \cdot \frac{\binom{n - n_3}{n_1 - n_3}}{\binom{n}{n_1}} \cdot \frac{\binom{n - n_1}{n_2 - n_3}}{\binom{n}{n_2}}$$

$\binom{n}{n_3}$ = Number of different combinations of common items that can be drawn from universe

$\binom{n - n_3}{n_1 - n_3}$ = number of ways to draw other than common items for (n_1)

$\binom{n}{n_1}$ = total number of ways to draw (n_1)

$\binom{n - n_1}{n_2 - n_3}$ = number ways to draw other than duplicates (from n_1) for (n_2)

hence $n - n_1$ = number elements left for (n_2)

$n_2 - n_3$ = number to draw from the $(n - n_1)$

$\binom{n}{n_2}$ = number ways in general to draw (n_2)

Substituting numbers from our hypothetical example into the formula:

$$P = \frac{11 \,!\, 9 \,!\, [21 \cdot 20 \cdot 19 \cdot 18 \cdot 17]}{6 \,!\, 5 \,!\, 3 \,!\, [30 \cdot 29 \cdot 28 \cdot 27 \cdot 26 \cdot 25 \cdot 24 \cdot 23 \cdot 22 \cdot 21 \cdot 20]} = .03$$

The formula indicates that the probability of the two panels selecting the six common vocational programs by chance alone is 3 in 100 or expressed differently $P \leq .03$.

This hypothetical example shows close agreement between the two panels in their choice of successful vocational programs. If such probabilities were obtained with real data, we could have a good deal of confidence that our instruments were understood and responded to in a similar fashion by most panel members; that our participants were matched fairly carefully in the two panels; and most importantly, that there is essential agreement among a broad cross section of the college community on those programs which deserve the designation "most successful". This reliability determinant has been computed and reported for the Phase I returns of each participating college.

PHASE I - Results

Table 1 on page 15 describes the basic results of the Phase I Delphi process. Six colleges submitted complete Phase I returns. In all cases, agreement between Delphi panels was sufficient to identify three programs which met the project definition of success. Thirteen of the sixteen colleges showed agreement between panels at P = .05 or less. One of the three colleges which did not reach a probability level of .05 upon initial administration of the second round questionnaire, readministered the second round questionnaire and reduced the probability level that a non-chance agreement was occurring from .145 to .0002. Ranking of the first three vocational programs meeting the project definition for successful programs did not change for this college. It was assumed from this test that the procedure was sufficiently reliable to accept the Round 2 results from all colleges as a valid indicator.

In Table 1, colleges are identified by a number only. It was agreed at the outset of the project that programs identified as most successful on individual college campuses would not be publicly named. Each vocational education dean participating in the study was furnished a list of the names of the three programs on each college campus. It was assumed that such a list might be valuable to the dean for visitation purposes when instituting or revising a similar vocational program on his own campus.

Although Table 1 is somewhat lengthy, it was felt that inclusion of the complete results of the first two Delphi rounds was warranted. Since the study deals with an experimental procedure which may have significance beyond the specific application in this study, a full report on the process is in order. Percentages in the table refer to the percentage of people in the panel selecting a given vocational program as most successful in each of the first two rounds of the Delphi process. A third column shows combined percentages only for those programs identified by both groups.

A third round was included in this Delphi process but is not shown in Table 1. In the third round, panel members were asked to select statements which reflect most important reasons for calling a program successful. While this information was important in the development of the Phase II standardized interview, it was not considered as meaningful as the data which have been presented. It was therefore not included in the context of this report but has been organized in Appendix 4.

TABLE 1

IDENTIFICATION OF MOST SUCCESSFUL VOCATIONAL PROGRAMS

COLLEGE 1

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Accounting	9%	36%		27%		
Advertising		9%				
Auto. Body Mech.*	54%	36%	72%	46%	59%	1
Busi. Data Proc.	18%	27%				
Const. Man.		9%				
Drafting	18%	18%				
Electronic	36%	36%	18%	27%	23%	5
Envir. Hort.	27%	27%				
Fashion Car.	9%					
Fire Science		46%		27%		
Food Ser. Man.	27%	9%	18%			
Gen. Office Tr.	9%					
Hvy. Equip. Mech.	46%	36%	36%	27%	32%	4
Human Serv.	9%	9%				
Ind. Weld.		18%				
Inhl. Therapy	54%	9%				
Management *	18%	36%	18%	46%	32%	3
Nat. Res. Mgmt.	27%					
Nursery Sch.	18%					

COLLEGE 1 (cont.)

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Nursing*	54%	27%	54%	54%	54%	2
Real Estate	9%	18%		9%		
Rec. Leader	9%	27%				
Sec. Trang.	27%	27%				
Small Busi.	18%	9%				
Med. Asst.		9%				
Programs identified by each panel	20	21	6	8	Probability of arriving at panel ratings by chance alone: $p \leq .001$	
Programs commonly identified	16		5			
Total programs offered	32					

* Programs meeting the project definition of most successful vocational education programs.

COLLEGE 2

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Fash. Des.	18%					
Accounting		9%				
Mark. & Mer.		9%				
Secretarial	46%	54%		18%		
Bus. Data Proc.	9%	9%	9%			
Real Estate	9%					
Auto. Tech.	46%	9%	18%			
Electronics	9%					
Law Enforce.*	91%	100%	100%	100%	100%	1
Fire Science	9%					
Inh. Therapy	81%	63%	54%	27%	41%	4
LVN*	63%	81%	54%	72%	63%	3
Nursing		9%				
Agriculture*	63%	72%	63%	81%	72%	2
Parks & Rec.		9%				
Programs identified by each panel	11	11	6	5		
Programs commonly identified	7		4			
Total programs offered	17					

Probability of arriving at panel ratings by chance alone: $p \leq .027$

COLLEGE 3

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Accounting	27%	18%				
Aero Main	9%					
Airframe		9%		10%		
Arch. Eng.		9%				
Basic TV Rep.	9%					
Computer Prog.		9%				
Criminology	36%	18%	50%			
Data Proc.	9%					
Dental Asst.	9%					
Dental Lab.	9%	18%		20%		
Design Draft. Eng. Tech.	18%	9%	10%	10%	10%	4
Drafting	9%					
Dynamic Read.	9%		10%			
Electrical-Electronics. Eng.		18%		40%		
Electrical-Electronics Technology		18%				
Electrical Theory & Te.						
Electrician		9%		10%		
Electro-Mech.	9%					
Fire Science		9%				
Hotel & Res.*	63%	81%	90%	70%	80%	1

COLLEGE 3 (cont.)

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Inhal. Ther.	9%					
Lib. Tech.		18%				
Mech. Eng.		9%				
Mech. Tech.		9%				
Medical Asst.	18%	9%		10%		
Merchandising	9%					
Nursing*	54%	45%	80%	60%	70%	2
Office Trng.	18%	18%	10%	10%	10%	5
Plumbing	18%		10%			
Psychiatric		9%				
Radiol. Tech.	9%		10%			
Retail Flor.	9%	9%				
Sec. Trng. Adult Div.		9%				
Sec. Trg. CCSF*	9%	27%	10%	40%	25%	3
Sheet Metal	9%					
Shorthand	9%	9%				
Super. & Man. BAC	9%					
Super. & Man. Hunters Point		9%				
Surveying E.	9%		10%			

COLLEGE 3 (cont.)

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Teacher Asst.	9%	9%				
Typing		18%				
Voca-Nurse		18%		20%		
Programs identified by each panel	27	27	10	11		
Programs commonly identified	12		5			
Total programs offered	101					

Probability of arriving at panel ratings by chance alone: $p \leq .001$

COLLEGE 4

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
App. Carpentry	10%	10%				
Bus. Adm.	20%	30%	10%	10%	10%	4
Off. Occupa.*	70%	60%	60%	80%	70%	2
Real Estate		30%				
Supervision		10%		10%		
Crime Prev.	70%	20%	30%			
Drafting	10%					
Fire Science	20%	60%		70%		
Voc. Nursing*	100%	90%	90%	90%	90%	1
Home Occupa.		20%				
Resort Manag.	10%	30%				
Heavy Equip.*	70%	50%	30%	40%	35%	3
Forest Tech.	30%	20%	30%			
Natural Res.	50%	30%	40%			
Programs identified by each panel	11	13	7	6	Probability of arriving at panel ratings by chance alone: $p \leq .127$	
Programs commonly identified	10		4			
Total programs offered	17					

COLLEGE 5

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Appliance Serv.	50%	40%	60%	20%	40%	4
Auto Services	20%					
Business	30%	20%	20%			
Computer	50%	60%	50%	20%	35%	5
Dental Asst.	10%		10%			
Electronics	40%					
Environ. Design		20%				
Food Services		40%		40%		
Manag. & Super.	10%	20%	10%			
Matls. Eval.	30%	20%				
Nursery School	10%					
Nursing, R.N.*	100%	60%	90%	60%	75%	1
Police Science*	40%	60%	30%	80%	55%	3
Public Serv.	10%					
Radio & Tele.	10%					
Secretarial	10%					
Welding*	50%	80%	30%	80%	55%	2
Programs identified by each panel	15	10	8	6	Probability of arriving at panel ratings by chance alone: $p \leq .041$	
Programs commonly identified	8		5			
Total programs offered	17					

COLLEGE 6

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Photography	9%	9%				
Data Proc.*	46%	72%	81%	81%	81%	1
Real Estate	27%	36%		36%		
Secretarial	18%	18%	9%			
Auto Mech.	9%	46%		36%		
Auto Tech.	18%	27%	9%	9%	9%	4
Machine Tool Tech.				9%		
Quality Cont.	27%	18%	18%			
Med. Asst.	27%	27%	27%			
Nursing, R.N.*	63%	63%	72%	46%	59%	2
LVN	36%	36%	46%			
Physical Ther. Asst.	9%	9%				
Law Enforc.*	36%	54%	36%	81%	59%	3
Nursery School	18%					
Rec. Leader	9%					
Programs identified by each panel	14	12	8	7	Probability of arriving at panel ratings by chance alone: $p \leq .113$	
Programs commonly identified	12		4			
Total programs offered	24					

COLLEGE 7

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Ornamental Horticulture	9%					
Arch. Const. Technology	9%					
Real Estate	18%	18%				
Sec. Studies	36%	36%	18%	45%	32%	4
Manage. and Supervision	18%	18%		18%		
Computer Sci.	9%	18%	9%			
Elec. Tech.	45%	27%	36%	9%	23%	5
Drafting Te.	18%	18%		9%		
Machine Tech.	9%	9%				
Dental Hyg.*	64%	64%	64%	73%	69%	1
Dental Tech.		9%				
Dental Asst.	18%	9%				
LVN*	45%	55%	73%	73%	73%	2
Apparel Des.	18%	18%	9%			
Adm. of Jus.*	73%	27%	82%	45%	64%	3
Fire Science	18%	9%				
Rest. Manag.	36%	27%	9%	18%	14%	6
Carpentry		9%		9%		

COLLEGE 7 (cont.)

Programs identified by each panel	16	16	8	9	Probability of arriving at panel ratings by chance alone: $p \leq .0007$
Programs commonly identified	14		6		
Total programs offered	38				

COLLEGE 8

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Aeronautics	9%	18%				
Air. Host.	9%	9%	9%			
Bank & Fin.	9%					
Com. Art	9%					
Dent. Asst.	7%	46%	9%			
Dent. Hyg.*	72%	100%	90%	81%	86%	1
Electronics	46%	36%	63%	27%	45%	4
Engineering		9%				
Inh. Ther.*	72%	63%	63%	72%	68%	2
Lib. Tech.	18%	27%				
Marketing	9%	9%				
Orna. Hort.	18%	18%				
Orthopedic Asst.	9%	9%				
Rad. Tech.	54%	36%		9%		
Real Estate*	63%	46%	54%	72%	63%	3
Recreation		9%				
Sec. Adm.	9%	9%				
Sec. Skills	46%	18%	9%	9%	9%	5
Tech. Illus.		9%				

COLLEGE 8 (cont.)

Programs identified by each panel	16	17	7	6	Probability of arriving at panel ratings by chance alone: $p \leq .003$
Programs commonly identified	14		5		
Total programs offered	24				

COLLEGE 9

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Air Cond. & Refrigeration	25%	38%	25%	38%	32%	4
Carpentry	25%	25%	25%			
Const. Tech.		13%				
Drafting	38%	25%	50%			
Electronics		25%		13%		
Food Prep. and Service*	25%	63%	13%	63%	38%	2
Graphic Arts	25%		50%			
Mach. Shop Tech.	13%					
Welding Tech.	25%	13%	13%			
Photo & Cine.		25%		13%		
Sheet Metal*	25%	38%	25%	38%	32%	3
Shoe Rebuild.		13%		13%		
Dry Cleaning	13%	13%				
Voca. Nursing*	50%	63%	88%	63%	76%	1
Cosmetology	38%	38%		25%		
Supervision	25%	38%		25%		
Quality Con.	13%	13%	13%	13%	13%	5

COLLEGE 9 (cont.)

Programs identified by each panel	13	15	9	10	Probability of arriving at panel ratings by chance alone: $p \leq .168$
Programs commonly identified	11		5		
Total programs offered	25				

COLLEGE 10

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Adm. of Just.	20%	40%	10%	30%	20%	6
Accounting	10%					
Business	10%	10%				
Gen. Cler.	10%					
Secretarial	10%					
Chem. Tech.		20%				
Com. Soc. Serv.	10%	20%		20%		
Data Proc.	20%	50%	10%	20%	15%	8
Fire Science		10%		10%		
Nurs. Sch. Aide	20%	40%	20%	40%	30%	4
Nursing, R.N.*	40%	30%	40%	70%	55%	1
Optometrics		10%				
Orna. Hort.		20%				
Rec. Ed.		10%				
X-ray Tech.*	40%	50%	30%	70%	50%	2
Carpentry	30%	10%	30%	10%	20%	5
Electronics	20%	20%	10%	20%	15%	7
Ironworking	10%					
Machine Shop	10%	10%				
Welding*	40%	10%	70%	10%	40%	3

COLLEGE 10 (cont.)

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Inst. Aide		10%				
Nurse Aide	10%					
Programs identified by each panel	17	18	9	10	Probability of arriving at panel ratings by chance alone: $p \leq .00005$	
Programs commonly identified	12		8			
Total programs offered	31					

COLLEGE 11

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Agriculture		9%		9%		
Dist. Educ.	18%	9%	9%	9%	9%	7
R.N.*	18%	36%	55%	27%	41%	3
Voc. Nursing*	27%	27%	36%	55%	46%	2
Psy. Tech.	18%	36%	27%	9%	18%	5
Inhal. Ther.		18%				
Early Child.	18%	18%	9%	18%	14%	6
Acctg. & Comp.		18%				
Inst. Aides	9%		9%			
Police Science*	27%	27%	55%	91%	73%	1
Photo. Tech.	9%		9%			
Mech. Tool		18%				
Fire Science	9%		9%	9%	9%	8
Welding Tech.	9%	18%	18%	27%	23%	4
Tele. Commun.		18%		9%		
Gen. Work Exp.	9%					
Office Edn.	9%	36%		27%		
Programs identified by each panel	12	13	10	10		
Programs commonly identified	8		8			
Total programs offered	32					

Probability of arriving at panel ratings by chance alone: $p \leq .00004$

COLLEGE 12

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Accounting	18%	9%				
Agri. Business	9%					
Auto Diesel	27%	18%	9%	18%	14%	6
Build. Trade	82%	55%	36%	18%	27%	5
Clerk/Typist	27%	55%	9%	9%	9%	8
Drafting	18%	18%				
Food Services*	55%	64%	27%	45%	36%	3
Nursing LVN*	91%	73%	82%	82%	82%	2
Metals and Weld.	9%	18%	9%	9%	9%	7
Psychiatric Tech.*	82%	82%	91%	91%	91%	1
Real Estate	9%					
Secretarial	55%	55%	36%	27%	32%	4
Voc. Forestry	18%	27%				
Programs identified by each panel	13	11	8	8	Probability of arriving at panel ratings by chance alone: $p \leq .000003$	
Programs commonly identified	11		8			
Total programs offered	22					

COLLEGE 13

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Aero. Tech.*	78%	67%	67%	78%	73%	1
Ag. Mch.	11%	11%	11%			
Horticulture*	56%	45%	45%	56%	51%	3
Clerk/Typist	22%	11%				
Sec. Sci.		11%	11%			
Electronics	11%	11%	11%	11%	11%	5
Draftsman		11%				
Police Science	11%	22%				
Ag. Busi.	11%	11%		11%		
Ag. Chem.	11%					
Ag. Gen.	11%	22%	11%	11%	11%	6
For. & Park Tech.	11%	33%		33%		
Auto. Tech.	56%	22%	33%	11%	22%	4
Bookkeeping	11%	11%				
Gen. Busi.	11%	22%	11%			
Marketing	22%	11%	11%			
Dent. Asst.*	56%	56%	78%	67%	73%	2
Ind. Tech.	11%	11%				
Child Gro. & Dev.	22%	22%		22%		
Home Econ.	11%		11%			

COLLEGE 13 (cont.)

Programs identified by each panel	18	18	11	9	Probability of arriving at panel ratings by chance alone: $p \leq .031$
Programs commonly identified	16		6		
Total programs offered	30				

COLLEGE 14

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Asso. Degree Nurs.*	*	*	90%	60%	75%	2
Auto. Services	*	*	70%	10%	40%	5
Bus. Prog.	*	*	10%			
Carpentry		*				
Data Processing		*				
Dental Assisting		*				
Hot. & Rest. Man.*	*	*	60%	70%	65%	3
Marine Div. Tech.*	*	*	100%	80%	90%	1
Nurs. Sch. Aide	*	*	40%			
Police Science	*	*	60%	60%	60%	4
Radiolo. Tech.	*					
Real Estate	*	*				
Voc. Nursing	*	*				
Programs identified by each panel	10	12	7	5	Probability of arriving at panel ratings by chance alone: $p \leq .016$	
Programs commonly identified	9		5			
Total programs offered	13					

COLLEGE 15

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Animal Science	9%	27%	18%	9%	14%	5
Ag. Busi.	36%	18%	9%	9%	9%	6
Plant Science	9%					
Bookkeeping	9%					
Clerical	9%	9%				
Data Proc.	18%	18%				
Gen. Business	9%	18%	9%			
Retail Mer. Mgmt.		9%				
Secretarial	27%	18%		9%		
Civ. Eng.	9%	27%	27%			
Dent. Asst.	36%	36%	9%			
Electronic	18%	45%	9%	9%	9%	7
Forest Tech.	27%	54%	27%			
Homemaking	9%					
Auto. Mech.*	64%	63%	64%	73%	69%	2
Inh. Ther.	18%			9%		
Nursery School		9%				
Police Science*	73%	81%	82%	91%	87%	1
Radio. Tech.	9%					
Assoc. Nurs.	36%	36%	18%	27%	23%	4
Voc. Nurs.*	64%	45%	27%	64%	46%	3

COLLEGE 15 (cont.)

Programs identified by each panel	19	16	11	9	Probability of arriving at panel ratings by chance alone: $p \leq .011$
Programs commonly identified	14		7		
Total programs offered	26				

COLLEGE 16

PROGRAM	FIRST ROUND Percent Selecting Program		SECOND ROUND Percent Selecting Program		COMMONLY IDENTIFIED PROGRAMS	
	Panel A	Panel B	Panel A	Panel B	Combined Percent	Rank
Ag. Bus.	11%					
Air. Stew.	11%					
Assoc. Nurs.*	67%	67%	63%	54%	59%	1
Auto. Mech.	11%	67%	9%	63%	36%	4
Aerona. Tech.		11%				
Broadcasting	11%					
Carpentry	11%					
Clerk/Typist	11%					
Comp. Sci.	22%	33%		9%		
Drafting	11%	11%				
Electronics	44%	55%	27%	18%	23%	5
Fire Science		11%				
Nt. Res.	11%	22%	9%			
Heavy Duty Mech.	11%					
Orna. Hort.	11%					
Med. Asst.	22%	22%	9%			
Nursing, LVN	55%	11%	18%			
Police Science*	67%	44%	46%	36%	41%	3
Secretarial	11%	22%				
Sec. Skills*	67%	33%	63%	36%	50%	2

COLLEGE 16 (cont.)

Programs identified by each panel	18	14	8	6	Probability of arriving at panel ratings by chance alone: $p \leq .00036$
Programs commonly identified	10		5		
Total programs offered	42				

Table 2 below abstracts those programs identified as most successful in colleges and groups them according to vocational area.

TABLE 2 FREQUENCY OF VOCATIONAL PROGRAM SELECTION

Vocational Area	Programs Identified	Frequency
Agriculture and Natural Resources		
	Agriculture	1
	Horticulture	1
Business and Business Management		
	Food and Food Services	2
	Hotel and Restaurant Management	2
	Management Training	1
	Real Estate	1
Clerical and Secretarial		
	Office Occupations	1
	Secretarial Skills	1
	Secretarial Training	1
Computer and Information Technology		
	Data Processing	1
Criminal Justice		
	Administration of Justice	1
	Law Enforcement	2
	Police Science	4
Health Services		
	Associate Degree Nursing	8
	Dental Assisting	1
	Dental Hygiene	2
	Inhalation Therapy	1
	Licensed Vocational Nursing	7
	Psychiatric Technician	1
	X-ray Technician	1
Trade and Industrial Technology		
	Aero Technician	1
	Auto Body Mechanics	1
	Auto Mechanics	1
	Heavy Duty Mechanics	1
	Marine Diving Technician	1
	Sheet Metal	1
	Welding	2

PHASE II

In Phase II of the study, a questionnaire was developed and administered in a standardized interview of first-line administrative personnel of successful and "other" vocational education programs. Data from the questionnaires were coded and analyzed. The two hypotheses forming the basis of the study were tested.

Hypothesis I - Vocational programs identified by Delphi panels as most successful have common identifiable characteristics.

Hypothesis II - Vocational programs identified by Delphi panels as most successful differ from "other" programs in program characteristics.

Basis of the Standardized Interview

The questionnaire used in the standardized interview conducted in Phase II of the study was developed from two major sources. First, at the initial planning conference, vocational education deans were asked to contribute clearly worded statements on 3 x 5 cards indicating their opinion on what made vocational education programs effective. Each dean was then asked to rate all statements as to importance. Conference participants then categorized the statements and attempted to estimate how each category might be measured. Second, statements made by panel participants in the Delphi exercise on each college campus were collected. Duplicate or very similar statements were combined. Statements were listed on 3 x 5 cards. A group of five judges knowledgeable in vocational education programs and curriculum development then categorized these statements. Those statements judged to be effects or outcomes of successful vocational education programs were separated from statements judged to be causal elements. As an example, the statement "This program is very popular with students on campus" would be judged to be an effect or outcome of a successful program whereas the statement "Instructors in this program are very good" would be judged to be a causal element.

The cause and effect criteria was applied to the list of statements provided by vocational education deans. Only those statements which were

judged to be causal were considered as possible elements in the questionnaire. The Phase II questionnaire was developed from those elements of the vocational deans statements and the Delphi panelists statements which could reasonably be expected to be collected through the interview process.

Limiting data collection activities in Phase II of the project to a standardized interview was a necessary but less than ideal choice. Many suggested variables for identifying successful vocational programs could not be measured through the interview process. Under ideal circumstances with more time to develop the study, more direct measures of variables affecting vocational programs would have been made. A complete standardized interview is shown in Appendix 5.

Definition of "Other" Vocational Programs

"Other" vocational programs on the college campuses were identified as any vocational program meeting the project definition for vocational programs but not selected jointly by panel participants in the second round of the Delphi process. Researchers on each college campus were asked to choose any three programs which met the definition for "other" programs, but no rigorous randomization process was recommended to the local colleges. While on most campuses a random selection process was carried out in the identification of "other" programs, no standard procedure was introduced. There were practical reasons why this could not be accomplished, but the lack of a standardized procedure was considered to be one of the major design weaknesses of the study.

Administration of the Phase II Questionnaire

Six Phase II interviews were carried out on each participating college campus. The first-line supervisor of the three vocational programs identified as most successful and the three programs identified as "other" programs were interviewed by the college research team. All interviews were then collected for data analysis.

PHASE II - Plan of Analysis

The Phase II questionnaire yielded approximately 80 bits of information with which programs identified as successful could be contrasted and tested against programs which were not identified as successful. In addition, 50 to 100 bits of information could be created through the use of "dummy" items or variables.

The strategy which guided the analysis of these data was to select an expedient design which could be communicated clearly to the intended audience. For this reason, chi-square and correlational statistics predominate as analytical tools.

Questionnaire Returns

Seventy-two usable Phase II questionnaires developed from interviews were returned in time for the analyses which follow. These questionnaires described three vocational programs from each of twelve community colleges in northern California identified in round one as "successful" and three vocational programs from each of the same colleges which were not so identified.

Condition of Data

The vast majority of the questionnaires were completely filled out. Missing data were rare and generally fell into two categories where:

1. the information requested was not applicable to the program
2. the information was not known to the respondent

If criticism is to be made of the questionnaire, for design purposes, it is that some of the items were not worded tersely enough and that some items were not easily coded in a form that is readily machine processable for tabulation purposes. Yet this coding "oversight" produced several benefits. Questions that are designed primarily for electronic data processing are often mechanical and present an image which may appear unduly "cold" to the person responding to them. In addition, it is often difficult to anticipate all responses with a package of prepared answers. In an exploratory study such as this, the use of open-ended questions can often elicit important information from informed and considerate respon-

dents. This point is illustrated by question 1 in the Program Management section. In this question, a large number of combinations were recorded which could not have been anticipated. Perhaps the main omission in the questionnaire was its failure to elicit "hard" data such as is gathered by management information systems. Yet these data are not easily accumulated even by management specialists. Specific measures of program functioning would require more than one year to agree upon common definitions and collection methods.

Coding of Data

Within the limits of the questionnaire data was coded and analyzed in an appropriate manner. The codes used for each question are listed in Appendix 4. Briefly, all questions which could be answered with a continuous numeric variable were utilized as recorded. The following exceptions were made:

1. Successful programs were coded "1" and programs not so identified were coded "0".
2. Page 1, question 5. The ratio of males to females was converted to a percentage of males.
3. Page 1, question 6. Many questionnaires had both inside and outside checked. This was coded: within = 1, both = 2, and outside = 3.
4. Page 1, questions 1 and 2 on instructors. The number checked was used except for "more than 5" where a "6" was used. Where an explicit number was given (such as "8") the number given was used. Part-time instructors were coded with one part-time instructor equaling one half full-time instructor.
5. Wherever a yes/no answer was given, the no was coded "0" and the yes was coded "1".
6. For those questions which were answered with a check, a "1" was used for a check and a "0" was used for a blank.
7. Several questions elicited comments or a list of items as in question 10 on page 6. If an item was mentioned or a comment was made, then it was coded "1" and a blank was coded "0".

The use of these codes, both continuous and dichotomous, made possible the correlational statistics and the tests of hypotheses which are presented in Table 3.

Means and Standard Deviations

Means and standard deviations are presented in Table 3. Means and standard deviations were computed separately for the 36 programs identified as successful and for the 36 programs not so identified. Standard deviations have been tabled for continuous variables, but not for dichotomous items or variables because these would only serve to clutter the table. Standard deviations can be computed from the means for any dichotomous variable by application of the formula S.D. = $\sqrt{Npq}$ where N = 36, p = the tabled mean, and q = (1 - P).

Correlations with "Successful"
(The reader who is familiar with correlational statistics may skip the next paragraph.)

Complete correlational data is presented in Table 3. All variables to be correlated with "success" were coded in such a way that an increase in the number coded means "more of something". Since programs identified as successful are coded "1" and programs not identified as successful are coded "0", positive correlations mean that more or whatever is being correlated with success tends to correlate with success. This can be illustrated by inspecting several items in Table 3. It will be seen that the number of units required in the major and number of years the program has been offered on campus both correlate positively with success. That is, the programs identified as successful tend to require more units and tend to have been offered over a longer period of time. Item 3, having to do with state licensing of a program, is dichotomous. It tells us that state licensing procedures tend to correlate with success. That is, more often than not, "success" is associated with state licensing requirements. Other items have correlation coefficients which are negative. For example, the coefficient for question 7 in the Placement and Recruiting section has a negative sign before it and illustrates a negative correlation where we can associate fewer provisions for remedial work with programs identified as successful. Conversely, we can associate more provision for remedial work with programs not identified as successful.

PHASE II - Results

The essential results of the Phase II questionnaire are shown in Table 3 on the following several pages. The table is in general self-explanatory and relates specifically to items on the questionnaire, although some items are paraphrased. The meaning of the capital letters following some of the correlation coefficients may not be immediately apparent to the reader. The capital letter is a code for correlation coefficient probabilities and is explained at the conclusion of the table on page 52.

From Table 3 it will be seen that 20 of the 58 correlation coefficients calculated for these data have a likelihood or probability of happening through the workings of chance of less than one in ten. Although this minimal "level of significance" or $P < .10$ is acceptable to many social scientists, the preferred "level of significance" is one chance in twenty or $P < .05$. The twenty items which are represented by these correlations, are the items on which we will concentrate in the analysis that follows the presentation of Table 3.

TABLE 3

The Relationship Between Responses on the Phase Two Questionnaire and Success Ratings of Vocational Programs

		Means		SD		Correlation Coefficient	Test Statistic	p* Less Than
		Success	Other	Success	Other			
	PROGRAM IDENTIFICATION							
1	What are the number of units required in the major?	56.47	49.25	23.92	18.57	.169	1.43	NS
2	What are the number of years the program has been offered on campus?	12.22	8.61	10.36	8.62	.189	1.61	NS
3	Does this program have a state licensing or certification procedure?	.89	.22			.447 A	14.40	.005
4	What is the ratio of males to females in the program?	48.81	76.69	41.90	34.36	-.346 B	-3.09	.01
5	Is your best job market within the college district or outside the college district?	1.47	1.64	1.21	.93	.000	.70	NS
	INSTRUCTIONAL STAFF							
1	How many different instructional staff members are involved in teaching required courses?	4.45	3.01	2.20	1.61	.355 B	3.17	.01
2	How many instructors have had full-time experience in this field?							
	a. number within past 2 years	2.28	1.01	2.32	1.21	.327 B	2.89	.01
	b. number within past 4 years	.89	.72	1.53	1.23	.061	.51	NS
	c. number within past 6 years	1.22	1.21	1.97	1.57	.005	.04	NS

* For continuous variables the t-test was used. For dichotomous variables the chi-square test was used.

Table 3 (cont.)

		Means		SD		Correlation Coefficient	Test Statistic	p* Less Than
		Success	Other	Success	Other			
3	How many instructors have had part-time or summer experience during the 1971-72 school year?							
	a. number having part-time experience during the regular school year	1.38	.86	2.26	1.29	.144	1.21	NS
	b. number having summer experience	1.50	.83	2.16	1.03	.196 D	1.67	.10
	EQUIPMENT AND FACILITIES							
1	What are five major pieces of equipment necessary to train students?	4.31	4.54	1.47	1.62	-.077	-.65	NS
2	How many of these five pieces of equipment are not available or need replacement?	.72	.77	1.34	1.24	-.019	-.16	NS
3	Is the space provided for students adequate for essential training?	.58	.72			-.146	1.53	NS
4	Is all equipment required provided by the college?	.78	.86			-.088	.55	NS
5	If some equipment is provided by the student, what is the cost to the student?	18.39	18.50	32.16	33.01	-.002	-.01	NS
6	Are off-campus facilities regularly used in the training of students?	.75	.58			.177	2.25	NS
7	How are off-campus facilities used?							
	a. used in a regularly scheduled class	.56	.33			.224 D	3.60	.10
	b. used irregularly for work experience	.42	.36			.057	.23	NS
	c. used for field trips	.61	.44			-.167	2.01	NS
	PROGRAM MANAGEMENT							
1	See Tables 7A - 7J.							

Table 3 (cont.)

		Means		SD		Correlation Coefficient	Test Statistic	p* Less Than
		Success	Other	Success	Other			
2	Are classroom visitations made regularly by supervisory personnel?	.78	.58			.209 D	3.13	.10
3	Are tenured teachers visited?	.67	.44			.213 D	3.28	.10
4	Are non-tenured teachers visited?	.78	.56			.259 C	4.84	.05
5	By whom? See Tables 5 and 6.							
	CURRICULUM AND CLASS SCHEDULING							
1	When must students enter the program? See Table 11.							
2	How many students declared this program as a major in the 1970-71 school year?	108.32	57.22	89.68	49.33	.335 B	2.98	.01
3	Is there a specific course sequence?	1.11	1.11			.047	.16	NS
4	Is there an entry course required? See Table 8.							
5	Is a final or wrap-up course required? See Table 9.							
6	Are courses for this major scheduled as a block?	1.27	1.42			-.185	2.46	NS
7	Where did the last two curriculum changes for this program originate?							
	a. with one or more of the instructional staff	.61	.69			-.069	.34	NS
	b. with the department head or division chairman	.28	.31			-.031	.07	NS
	c. with the advisory committee	.19	.11			.116	.97	NS
	d. with the counseling office	.03	.00			.119	1.01	NS
	e. other source	.17	.22			-.070	.36	NS

Table 3 (cont.)

		Means		SD		Correlation Coefficient	Test Statistic	p* Less Than
		Success	Other	Success	Other			
	RECRUITING AND PLACEMENT							
1	Do members of the counseling staff regularly visit high schools?	.44	.50			-.083	.50	NS
2	Do members of the counseling staff specifically discuss this vocational major on regular visits to high schools?	.78	.69			.129	1.20	NS
3	Are brochures distributed regularly to high schools describing this occupational program?	.83	.67			.118	1.00	NS
4	Is publicity regularly released through the news media describing this vocational program?	.47	.44			.031	.07	NS
5	Are students in this program easily recognized as a member of this particular training group?							
	a. wears a uniform	.61	.22			.437 A	13.76	.005
	b. takes most of his courses in the same general area	.97	.81			.210 D	3.18	.10
	c. has most of his classes with the same students	.86	.78			.051	2.24	NS
	d. eats lunch together with other students in the same program	.69	.47			.196 D	2.76	.10
	e. takes frequent field trips together	.61	.56			.023	.04	NS
	f. has several classes where he works closely with the same students	.97	.81			.210 D	3.18	.10
	g. belongs to an occupational club	.44	.19			.250 C	4.51	.05
	h. other activities which identify the student with the program	.25	.19			.052	.19	NS
6	Are there prerequisite courses which limit student enrollment?	.53	.36			.156	1.75	NS
7	Are there specific remedial provisions available	.62	.37			-.201 D	2.90	.10

Table 3 (cont.)

		Means		SD		Correlation Coefficient	Test Statistic	p* Less Than
		Success	Other	Success	Other			
8	Are prospective students interviewed prior to admission to this program?	.58	.31			.280 C	5.63	.05
9	Are students given assistance in job placement? How?							
	a. by the college placement office	.25	.31			-.062	.28	NS
	b. by the instructional staff	.83	.83			.000	.00	NS
	c. from a specially designated staff member	.33	.25			.092	.61	NS
	d. from members of the Advisory Committee	.44	.42			.028	.06	NS
	e. other assistance	.44	.36			.074	.39	NS
10	Does the possibility for spinout jobs exist with this vocational program?	.94	.92			-.004	.00	NS
	ADVISORY COMMITTEE							
1	Does this program have an advisory committee which met during the 1971-72 school year?	.92	.75			.224 D	3.60	.10
2	When does this advisory committee meet? See Table 10.							
3	How many members are on the advisory committee?	15.08	10.51	9.58	6.26	.273 C	2.37	.05
4	Is the advisory committee responsible for more than one program?	.33	.22			.124	1.11	NS
5	How many advisory committee members are employed in this occupation?	12.22	8.51	9.12	5.78	.237 C	2.04	.05
6	Did the advisory committee propose or review the last two changes in the curriculum?	.56	.58			-.028	.06	NS
7	How many times in the past year have advisory committee members assisted in student placement?	10.94	5.83	16.79	5.83	.154	1.30	NS

(Codes for correlation coefficient probabilities: A = $p < .001$; B = $p < .01$; C = $p < .05$; D = $p < .10$)

Table of Correlations

The twenty items with acceptable correlations with success are listed in Table 4. They have been grouped under the headings of Student, Course, Instructor, Advisory Committee, and Miscellaneous. The logic of these clusters of items will be evident in the exposition which follows.

TABLE 4 ITEMS CORRELATED WITH SUCCESSFUL PROGRAMS

General Classification	Item Description*	Correlation† Coefficient
Student Items	Number of students in program	.335 B
	Percent male	-.346 B
	Interview prior to admission	.280 C
Student Visibility Items	Wears a uniform	.437 A
	Takes most courses in same area	.210 D
	Eats lunch together	.196 D
	Takes classes and work together	.210 D
	Belongs to occupational clubs	.250 C
Course Items	State licensing procedure	.447 A
	Off-campus facilities used regularly for class	.224 D
	Provision made for remedial work	-.201 D
Instructor Items	Number of instructors in program	.355 B
	Number of instructors with recent experience (2 years)	.327 B
	Number of instructors with recent summer experience	.196 D
Instructor Supervision Items	Classroom visitations made regularly	.209 D
	Tenured teachers visited	.213 D
	Non-tenured teachers visited	.259 C
Advisory Committee Items	Advisory committee met in 1971-72	.224 C
	Number of advisory committee members	.273 C
	Advisory committee members employed in the field	.237 C

* These titles are paraphrases. See the questionnaire in Appendix 5 for the exact wording of the questions. † The letters after the correlation coefficients indicate levels of statistical significance with probabilities of A<.001, B<.01, C<.05, and D<.10.

Student Items

Table 4 shows sex as one item which correlates significantly but negatively with success in this category. Although some of the strength of this correlation coefficient can be attributed to sampling problems (e.g., more "female" programs were selected as successful) it is likely that the sign

of the coefficient is correct. The negative correlation of "male" ratio would have been positive if we had said "female" ratio. From a feminist point of view, the wording of this question may have been but another manifestation of sex discrimination, yet the negative sign served to draw our attention to this variable first. Since the correlation is rather strong, as our correlations go, we must seriously consider the possibility that the programs local panels selected as successful tend to have more female students. The implications of this are profound and cannot be adequately discussed here. One implication suggests consideration of other items such as occur under the Student Visibility heading where females may be more likely to wear a uniform. Then again, sex may be related to achievement. Females may be better motivated to study than males at this age in vocational education programs and success as a program may be related to enrollment of more highly motivated female students.

The number of students in a program is also related to success. It may be that the larger programs are more visible on campus because of their larger enrollments and staff, and presumably, larger budgets.

The procedure of interviewing students prior to admission is also related to success. Again, this may be related to other items such as size and visibility. The selectivity suggested by an interview procedure for admission to a program is generally either a function of a surplus of applicants over "seats" or an attempt to increase success in a program by admitting only those who are likely to complete the course of study.

Student Visibility Items

These were mentioned above in connection with the number of students in the program. Successful programs appear to be programs where the students are more visible because they wear distinctive clothing or because they tend to cluster together for course work and extracurricula activities. This may be related to the success of the uniformed vocations such as nursing. It may be that these uniformed vocations stress external standards and prestige, as indicated by the high correlation of state licensing procedures (under Course Items in Table 4).

It seems clear that successful programs are those programs which have

higher proportions of females, which encourage visibility through distinctive clothing, which encourage a solidarity among students, and which function with some degree of state approval.

Course Items

One of the three items we have grouped under this title is negatively related to success. Although the correlation of the provision for remedial work with success is not very strong, the sign suggests that program success is contingent upon admission of students who do not require remedial work prior to admission to the program. Perhaps the better students gravitate to the more successful programs; perhaps students who enroll in successful programs have already completed their remedial work before applying for admission to a specific occupational program.

The use of off-campus facilities for class on a regularly scheduled basis as a correlate of success has to do with the glamour of the real world. Classes held in the field bring students into contact with problems that are relevant to the future occupation.

Instructor Items

The instructional staff characteristics associated with success are: size of instructional staff and current experience in the program specialty. Size of staff is related to the number of students in the major and the student-teacher ratio. A program with more instructors offers the students a wider choice of instructor viewpoint and personality and a wider view of job alternatives. Recent experience in the field may be related to the use of off-campus facilities for regularly scheduled class work.

Instructor Supervision Items

The strength of association of items related to supervision of instructors is not very strong. Nevertheless, these items point to the fact that successful programs seem to demonstrate a closer program management-staff relationship. Classroom visitations are made on a regular basis and they are made impartially to the classrooms of both tenured

and non-tenured teachers.

Although who visits the classroom does not make a difference, it is clear that teachers in programs identified as successful are subject to more visits by a wider range of supervisory personnel than are teachers in programs not identified as successful.

Advisory Committee Items

The strength of association of the three advisory committee items, although modest, points to the importance of the advisory committee to the identification of successful programs. It seems clear that success is contingent upon the number of committee members, the number of committee members who are currently employed in the occupation, and the meeting of the committee during the current school year.

TESTS OF HYPOTHESIS I - Vocational Programs Identified by Delphi Panels as Most Successful Have Common Identifiable Characteristics

T-tests were performed across "success" and "other" as groups for all variables that are continuous. The 17 tests can be identified in Table 3 by the presence of standard deviations for all continuous variables. It will be seen that seven of these tests were significant at the .10 level or less. In all cases except one, the mean for the "success" group was higher than the mean for the "other" group. The exceptional case was the item dealing with the male-to-female ratio in each program.

Chi-square tests were performed on all dichotomous items. The results are similar to those found with the t-tests. The thirteen tests significant at the .10 level or less also had correlation coefficients which were significant beyond the .10 level.

The evidence seems clear. Of all the items in the Phase II questionnaire, the 20 items listed in Table 4 have the greatest potential for describing successful programs.

Before going on to a test of Hypothesis II, we will present responses from other items which describe vocational educational programs in the colleges.

Program Management Items

Many items in the Phase II questionnaire did not lend themselves to statistical analysis of the kind used with continuous or dichotomous variables. These items deserve mention because they describe some processes in vocational education which may merit attention in future research.

The first group of tables have to do with simple counts of who in a management or supervisory capacity visits the classrooms of instructors. We determined above that items discussing visits to classrooms of teachers, both tenured and non-tenured, had the power to differentiate programs primarily because more visits were made to teacher's classrooms in successful programs. Tables 5 and 6 indicate who has the responsibility for making such visits for our sample. Although the items were significant, the frequency distribution of responsible persons revealed no basic differences. The person named most often as having responsibility for visits to classrooms in both successful and other programs is the chairman of the department or specialty, with the vocational education dean named second most frequently. A scattering of other people were also mentioned.

TABLE 5

Frequency of Mention of Titles of Responsible Persons in Program Management: "By Whom are Tenured Teachers Visited?" Program Management Question 2-A-1.

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	1	0	1
Voc-ed Dean	7	5	12
Chairman	14	10	24
Voc-ed Dean and Instructor	1	0	1
Voc-ed Dean and Chairman	1	0	1
Voc-ed Dean and Dean of Instruction	0	1	1

TABLE 6

Frequency of Mention of Titles of Responsible Persons in Program Management: "By Whom are Non-Tenured Teachers Visited?" Program Management Question 2-A-2.

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	1	0	1
Voc-ed Dean	5	4	9
Chairman	16	11	27
Voc-ed Dean and Instructor	1	0	1
One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	2	1	3
Voc-ed Dean, Chairman, and Instructor	0	1	1
Voc-ed Dean and Dean of Instruction	1	3	4

A second group of tables have to do with responsibility for ten necessary management functions identified in question 1 of the Program Management section of the Phase II questionnaire. Statistical tests were not performed on these data, and they are presented in Tables 7A through 7J for inspection and completeness.

TABLE 7A

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Major Responsibility for Calling Staff Meetings of Instructors Teaching in the Program?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Voc-ed Dean	2	6	8
Instructor	1	3	4
Chairman	30	25	55
Voc-ed Dean and Instructor	1	1	2
Voc-ed Dean and Chairman	1	0	1
Other	1	1	2

TABLE 7B

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Responsibility for Developing a Budget for this Occupational Program?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	5	2	7
Voc-ed Dean	4	5	9
Instructor	5	14	19
Chairman	18	11	29
Voc-ed Dean and Instructor	1	3	4
Voc-ed Dean and Chairman	2	1	3

TABLE 7C

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Responsibility for Interviewing Prospective Staff?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	1	4	5
Voc-ed Dean	1	8	9
Instructor	1	3	4
Chairman	16	15	31
Voc-ed Dean and Instructor	5	2	7
Instructor and One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	8	1	9
Voc-ed Dean, Chairman, and Instructor	0	1	1
Voc-ed Dean and Dean of Instruction	2	2	4

TABLE 7D

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Major Responsibility for Evaluating Instructors?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	0	1	1
Voc-ed Dean	7	9	16
Instructor	1	1	2
Chairman	16	18	34
Voc-ed Dean and Instructor	1	2	3
One or more of the Lay Committee	1	0	1
Instructor and One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	6	2	8
Voc-ed Dean, Chairman, and Instructor	2	1	3
Voc-ed Dean and Dean of Instruction	1	2	3

TABLE 7E

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Responsibility for Ordering Instructional Materials and Supplies?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	2	0	2
Voc-ed Dean	0	3	3
Instructor	8	18	26
Chairman	22	14	36
Voc-ed Dean and Instructor	0	1	1
Instructor and One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	2	0	2

TABLE 7F

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Major Responsibility for Initiating Curriculum Additions or Revisions?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	7	4	11
Voc-ed Dean	1	1	2
Instructor	7	23	30
Chairman	14	5	19
Voc-ed Dean and Instructor	2	2	4
One or more of the Lay Committee	0	1	1
Instructor and One or more of the Lay Committee	2	0	2
Voc-ed Dean and Chairman	3	0	3

TABLE 7G

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Major Responsibility for Developing a Class Schedule?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	5	6	11
Voc-ed Dean	1	2	3
Instructor	4	11	15
Chairman	21	12	33
Voc-ed Dean and Instructor	2	3	5
Voc-ed Dean and Chairman	2	1	3
Voc-ed Dean, Chairman, and Instructor	1	0	1
Other	0	1	1

TABLE 7H

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who has Responsibility for Making Teaching Assignments?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	5	5	10
Voc-ed Dean	2	4	6
Instructor	2	5	7
Chairman	19	18	37
Voc-ed Dean and Instructor	3	3	6
Instructor and One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	2	0	2
Voc-ed Dean, Chairman, and Instructor	1	0	1

TABLE 7I

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who is Responsible for Calling Advisory Committee Meetings?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	1	1	2
Voc-ed Dean	16	16	32
Instructor	3	3	6
Chairman	11	8	19
Voc-ed Dean and Instructor	0	3	3
One or more of the Lay Committee	0	2	2
Instructor and One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	3	0	3
Voc-ed Dean, Chairman, and Instructor	1	0	1

TABLE 7J

Frequency of Mention of Titles of Responsible Persons in Program Management: "Who is Responsible for Chairing Advisory Committee Meetings?"

RESPONSIBLE PERSON	SUCCESS	OTHER	TOTAL
Chairman and Instructor	0	1	1
Voc-ed Dean	9	10	19
Instructor	3	2	5
Chairman	13	11	24
Voc-ed Dean and Instructor	1	3	4
One or more of the Lay Committee	7	6	13
Instructor and One or more of the Lay Committee	1	0	1
Voc-ed Dean and Chairman	1	0	1

Although an in-depth analysis of the items described in the ten preceding tables will not be attempted, a systematic pattern was observed which ought to be noted. The pattern can be summarized as follows:

	DIVISION CHAIRMAN	EQUAL MENTION	INSTRUCTOR
SUCCESS	A, B, C, E, F, G, H, I, J (Division chairman is more often mentioned as initiating management activities in most successful programs: 9 of 10 functions.)	- - - - - (In no management function in most successful programs were instructor and division chairman equally mentioned: 0 of 10 functions.)	D (Instructor is less often mentioned as initiating management activities in most successful programs: 1 of 10 functions.)
OTHER	- - - - - (Division chairman is less often mentioned as initiating management activities in programs not identified as most successful: 0 of 10 functions.)	D, I (Instructor and division chairman are less often mentioned as equally sharing management activities in programs not identified as most successful: 2 of 10 functions.)	A, B, C, E, F, G, H, J (Instructor is more often mentioned as initiating management activities in programs not identified as most successful: 8 of 10 functions.)

Those instances are tallied where the instructor or the division chairman has been mentioned more often as responsible for a management function in Tables 7A-J. By "more often" here, we mean the relative frequency of mention for the same category. In most cases, in both successful and other programs, the chairman is mentioned more often than the instructor is mentioned for the same function. However, the comparison we make here, refers to how often each of the categories, chairman or instructor, is mentioned in success programs compared with how often that same category is mentioned in other programs.

There appears to be a difference in programs identified as successful and those not identified as successful in who initiates program management functions. In case of programs identified as successful, the division chairman is more often the initiator of management activities than he is in programs not identified as successful; whereas in programs not identified as successful, the instructor is more often identified. This is a striking difference in view of the fact that these programs are drawn from the same college campuses where one would assume that the management function would remain reasonably uniformed from program to program.

Miscellaneous Items

A third group of tables contain responses to three items which do not have the power to differentiate programs but are nevertheless of interest in themselves.

TABLE 8

Frequency of Response to Curriculum Question 4: "Is an Entry Course Required of, or Recommended for, all Students?"

RESPONSE CHOICE	SUCCESS	OTHER	TOTAL
Entry Course Required	21	18	39
Entry Course Highly Recommended	7	7	14
No Such Course	8	11	19

TABLE 9

Frequency of Response to Curriculum Question 5: "Is a Final or Wrap-up Course Required of, or Recommended for, all Students?"

RESPONSE CHOICE	SUCCESS	OTHER	TOTAL
Final Course Required	12	15	27
Final Course Recommended	4	3	7
No Such Course	20	18	38

Tables 8 and 9 are from the Curriculum and Class Scheduling sections of the Phase II questionnaire and describe the frequency of required entry or wrap-up courses for the various programs. Of the 72 programs we can say that 53 have a required or recommended entry course and 34 have a required or recommended final course. Some 19 programs have a "no such course" for entry, and twice as many, or 38 programs, have "no such course" for exit. There are no statistical differences between successful and "other" programs.

Two other tables in this third group describe the timing of certain events.

TABLE 10

Frequency of Response to Advisory Committee Question 2: "When does the Advisory Committee Meet?"

RESPONSE CHOICE	SUCCESS	OTHER	TOTAL
Monthly	1	4	5
Semester or Quarterly	14	9	23
Yearly	10	9	19
Upon Call	10	11	21
Other	1	3	4

TABLE 11

Frequency of Response to: "When must this Occupational Program be Entered by the Student?"

RESPONSE CHOICE	SUCCESS	OTHER	TOTAL
Fall Only	10	9	19
Spring Only	2	0	2
Either Semester	22	27	49
Other	2	0	2

Table 10 describes the times when the program Advisory Committees meet, presumably on a routine basis. There are no apparent differences between the successful and "other" programs. Table 11 describes the prescribed time of entrance of students into the program. There are no reported differences.

TESTS OF HYPOTHESIS II - Vocational Programs Identified by Delphi Panels as Most Successful Differ from "Other" Programs in Program Characteristics

Discriminant Analysis

Previously, we discussed the strength of association of 58 items (variables) with programs identified as successful. We then discussed tests of significance for the 58 items and concentrated on the 20 items which individually could statistically distinguish between the successful and "other" programs at an acceptable level of significance ($p < .10$). While the methods of correlations, chi-square and t-test, proved useful in identifying those variables which had the most potential for separating programs, they also had a drawback; they could only be used one at a time--they were univariate. In this section and in the section to follow, we will consider two techniques that can be used to "test" groups of items, techniques which are multivariate.

In this section we will discuss the results of a technique called discriminant analysis. Discriminant analysis is a method which identifies the basic ways in which groups differ from one another. In this procedure two or more items or variables are considered together. The items are weighted according to their ability to discriminate, and then the weighted coefficients are used collectively to separate groups (here, "success" and "other" programs) according to the laws of probability. After the discriminant weights or func-

tions are calculated for each program, each program can then be "scored" and assigned on the basis of probability to one group or another. In our case we compute the discriminant scores for groups of items for each of the 72 programs and then use these scores to assign the program to either of two groups, "success" or "other". This assignment can then be tabled and compared with the identifications made through the Delphi technique. A statistical test is made to indicate the "significance" of the difference between the weighted means of the groups of items.

Clearly one cannot consider all possible groups of the 58 items available nor would it be desirable to do so. We have selected several groups of items (which include all the items when considered collectively) on an a priori basis. These are presented in Tables 12A-L. It should be remembered that if the items selected for our discriminant analysis technique had a perfect ability to discriminate, we would identify all programs exactly as they were identified and labeled by the Delphi panels. The classification would be perfect. No programs would be incorrectly classified by the discriminant analysis, and any statistical test would be significant. Although perfect agreement is rarely, if ever, encountered with real data, the diagram below shows the relationship as it would appear in an ideal situation.

In a case where the agreement was perfect, the identification matrix would be:

IDEAL RELATIONSHIPS BETWEEN METHODS OF CLASSIFYING DATA

		DELPHI TECHNIQUE		
		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	36	0	100%
	Other	0	36	100%

We would have arrived at the same decision about each program by two different methods. If such were the case and identification were perfect by the discriminant analysis technique, we would merely have to collect information by questionnaire from each college on each program and analyze it. There would be no future need for the more costly and time consuming Delphi process.

Although perfect agreement of classification is desirable, it is not pos-

sible with the data at hand. What is possible is to apply discriminant analysis to groups of items and assess the technique's ability to agree with the a priori classifications derived by the Delphi process. Inspection of Tables 12A-L indicates that, for the twelve groups of items selected for analysis, the percentage of agreement runs from 50% in Table 12J to 97% in Table 12L. This may be interpreted as a random classification in Table 12J where as many "other' programs were classified correctly as were classified incorrectly, and an almost perfect classification in Table 12L where all but one on the "success" programs are correctly classified. Pertinent data from Table 12A-L has been collapsed for comparison purposes and is presented in Table 13.

A special case is presented in Table 12A where the twenty items found to be significantly associated with "success", were subjected to discriminant analysis as a "group". This is a group in name only because the items do not represent a common factor or generic group. These 20 items taken collectively have the ability to classify correctly 30 out of 36 "success" programs. Furthermore, 32 out of 36 "other" programs were classified correctly by both techniques.

With discriminant analysis we have used a statistical technique which is related to regression analysis to classify programs on the basis of known characteristics into two groups. The two groups are then tabled and contrasted with the classification of programs by the Delphi technique as in Tables 12A-L and "mis-classifications" noted. We are not prepared to say which technique is responsible for the mis-classification of programs. We want to stress the large number of programs correctly classified by <u>both</u> techniques and offer this as evidence of the validity of the Delphi technique when applied to the identification of successful vocational education programs in community colleges. Through the application of discriminant analysis to twenty easily obtained bits of data, we have been able to correctly classify five out of six programs independently identified as successful and seven out of eight programs not so identified. (See Table 12A). This is a truly remarkable amount of agreement between two apparently dissimilar techniques applied to the diverse vocational education programs offered by community colleges. It appears that generalization with regard to program characteristics of successful programs is quite possible, and therefore, further study should prove fruitful.

TABLE 12A

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Twenty Items Which are "Significant".

		DELPHI TECHNIQUE		
		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	30	6	83%
	Other	4	32	89%

$F(20,51) = 3.76 \quad p<.01$

TABLE 12B

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Five Items from the Program Identification Section.

		DELPHI TECHNIQUE		
		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	26	10	72%
	Other	8	28	78%

$F(5,66) = 5.54 \quad p<.01$

TABLE 12C

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Six Items from the Instructional Staff Section.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	24	12	67%
	Other	12	24	67%

$F(6,65) = 2.76 \quad p<.05$

TABLE 12D

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Nine Items from the Equipment and Facilities Section.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	25	11	69%
	Other	10	26	72%

$F(9,62) = 1.01 \quad NS$

TABLE 12E

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Three Items from the Program Management Section.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	27	9	75%
	Other	9	27	75%

$F(3,68) = 2.08$ NS

TABLE 12F

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Eight Items from the Curriculum and Class Scheduling Section.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	26	10	72%
	Other	10	26	72%

$F(8,63) = 1.97$ NS

TABLE 12G

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Twenty-One Items from the Recruitment and Placement Section.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	33	3	92%
	Other	7	29	81%

$F(21,50) = 1.60 \quad p<.10$

TABLE 12H

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Six Items from the Advisory Committee Section.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	21	15	58%
	Other	11	25	69%

$F(6,65) = 1.72 \quad NS$

TABLE 12I

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Four Items Describing Recruiting Visits to High Schools.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	26	10	72%
	Other	12	24	67%

$F(4,67) = .97$ NS

TABLE 12J

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Six Items Describing Placement Services.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	22	14	61%
	Other	18	18	50%

$F(6,65) = .24$ NS

TABLE 12K

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Eight Items Describing the Distinctive Visibility of Students.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	30	6	83%
	Other	7	29	81%

$F(8,63) = 3.72 \quad p<.01$

TABLE 12L

Comparison of Program Classifications made by the Delphi Technique and by Linear Discriminant Analysis for Three Items Delimiting Prerequisite, Interview, and Remedial Provisions.

DELPHI TECHNIQUE

		Success	Other	Percent Agreement
DISCRIMINANT ANALYSIS TECHNIQUE	Success	35	1	97%
	Other	13	23	64%

$F(3,68) = 3.86 \quad p<.05$

TABLE 13

Summary Table for Comparison of Delphi Technique with Linear Discriminant Analysis. Abstracted from Tables 12A-L.

Item Group	"Success" or "Other"	Percent in Agreement	F Ratio	Of	p Less Than
A	S	83	3.76	20,51	.01
	NS	89			
B	S	72	5.54	5,66	.01
	NS	78			
C	S	67	2.76	6,65	.05
	NS	67			
D	S	69	1.01	9,62	NS
	NS	72			
E	S	75	2.08	3,68	NS
	NS	75			
F	S	72	1.97	8,63	NS
	NS	72			
G	S	92	1.60	21,50	.10
	NS	81			
H	S	58	1.72	6,65	NS
	NS	69			
I	S	72	.97	4,67	NS
	NS	67			
J	S	61	.24	3,65	NS
	NS	50			
K	S	83	3.72	8,63	.01
	NS	81			
L	S	97	3.86	3,68	.05
	NS	64			

Multiple Regression Analysis

Thus far in the analyses, we have discussed the association (correlation) of questionnaire items with programs identified as "success" and "other" programs. We have tested the means of individual items for each of the two kinds of identified programs, t-test and chi-square, and we have examined the ability of subsets of questionnaire items to classify programs independently of the Delphi technique (through linear discriminant analysis). In this section we will test the predictive ability of a subset of available items in a multiple regression model. Although we cannot meet all of the assumptions necessary for complete accuracy and confidence in the multiple regression model (e.g., the number of programs sampled, N = 72, is not large enough for the number of variables we would like to "test"), we feel the results of such a regression, however acceptable, are of sufficient interest to be reported.

We will enter the 20 "significantly" correlated and tested items (see page 53) into a multiple regression equation in a stepwise manner in an attempt to predict the dependent variable "success". The variables are entered one at a time into the equation (via computer program BMD 02R) on the basis of their contribution to the partial correlation of the (already entered) combined variables. Contributions to the partial correlation coefficient are tested at each step and variables are either "kept" in the equation or rejected.

The basic data for this regression are given in Table 14. Acronyms have been provided for identification of items. The size of the coefficients (betas) give an indication of the relative contribution made by each variable when all variables are considered together. It will be noted that the item "non-tenured visits" did not qualify for the equation.

An analysis of variance based on the regression of the 19 entered variables is given in Table 15. The F ratio of 4.04 with 19 and 52 degrees of freedom, may be used to test the hypotheses that the 19 independent variables exercise no influence on the dependent variable, i.e., $b_1 = b_2 \ldots = b_{19} = 0$. The calculated F ratio is significant at $p < .001$. This of course, is not startling since we have already determined that each variable examined independently had the ability to differentiate "success" from "other" programs. Taken collectively, we would expect the 19 variables to reinforce each other.

We would like to use this collective reinforcement to make the major point of this section. Multiple regression calculations produce a multiple correlation coefficient, R, which indicates the extent to which all the 19 items considered together account for variance in the dependent variable, here success. The square of R, or R^2, represents the proportion of variance in the dependent variable accounted for by the 19 independent items. These "multiple Rs" and "multiple R^2s" are given in Table 16 where it is seen that six of the 19 variables account for about 50 percent of the variance in "success". The column labeled "Increase in R^2" shows the cumulative contribution of each item to the variance in this regression. We have arbitrarily drawn a line at the 50 percent point to separate the contributors of large amounts of variance in programs from the contributors of small amounts of variance. It should be noted that whereas the first six items account for 50.8 percent of the variance; the last 13 items account for less than 10 percent additional variance. Clearly, "success" or "other" programs can be best predicted by the first six items with diminishing and almost negligible contributions made to prediction by the remaining 13.

Through the technique of stepwise multiple regression we have been able to account for about 50 percent of the variance in successful programs with six items. This is a useful amount of variance to account for in an exploratory study and compares favorably with variance accounted for in behavioral science studies in general. It tells us which of the large number of items we began with are the best predictors of success. Our chances of increasing our ability to predict, and thus to identify the key parameters of successful programs, will be enhanced if we continue to study how success in vocational education programs is contingent upon the concepts embodied in these items.

TABLE 14

STEPWISE REGRESSION TABLE FOR TWENTY ITEMS*

Variables in the Equation (constant = -.179)

No.	Acronym	Coefficient	Standard Error
1	License	.294	.117
2	Male Ratio	-.002	.002
3	Number of Instructors	-.040	.036
4	Instructors with Experience in Last Two Years	.079	.031
5	Instructors with Recent Summer Experience	.030	.033
6	Off-Campus Classes	-.269	.123
7	Classroom Visits	.043	.031
8	Tenured Visits	.028	.029
10	Number of Students	.002	.001
11	Students Wear Uniforms	.334	.114
12	Students in Same Classes	.212	.187
13	Students Eat Lunch Together	.061	.122
14	Students Work Together	.236	.189
15	Students Occupational Clubs	.102	.117
16	Pre-Program Interview	-.101	.123
17	Remedial Course Work	-.101	.130
18	Advisory Committee Met Recently	.129	.141
19	Number of Advisory Committee Members	-.007	.011
20	Advisory Committee Members Employed	.006	.011

Variables Not in the Equation

No.	Acronym	Coefficient	Standard Error
9	Non-Tenured Visits	- - -	- - -

* Items found to differentiate "success" and "other" programs.

TABLE 15

ANALYSIS OF VARIANCE TABLE FOR THE DATA OF TABLE 14

Source of Variation	Of	SS	MS	F Ratio
Regression	19	10.727	.565	4.04*
Residual	52	7.273	.140	
TOTAL	71	18.000		

* p<.001

TABLE 16

SUMMARY TABLE FOR STEPWISE REGRESSION FOR TWENTY ITEMS

Step No.	Item No.	Item Entered*	Multiple R	Multiple R^2	Multiple in R^2
1	11	Students Wear Uniforms	.456	.208	.208
2	1	License	.556	.309	.102
3	10	Number of Students	.610	.372	.063
4	7	Classroom Visits	.657	.431	.059
5	14	Students Work Together	.693	.480	.049
6	4	Instructors with Experience in Last Two Years	.713	.508	.029
7	18	Advisory Committee Met Recently	.727	.529	.020
8	6	Off-Campus Classes	.734	.539	.010
9	2	Male Ratio	.741	.549	.010
10	8	Tenured Visits	.747	.558	.010
11	12	Students in Same Classes	.753	.566	.008
12	15	Students Occupational Clubs	.757	.574	.008
13	3	Number of Instructors	.761	.579	.005
14	5	Instructors with Recent Summer Experience	.764	.584	.005
15	13	Students Eat Lunch Together	.766	.587	.003
16	16	Pre-Program Interview	.768	.589	.002
17	17	Remedial Course Work	.770	.593	.004
18	19	Number of Advisory Committee Members	.771	.594	.001
19	20	Advisory Committee Members Employed	.772	.596	.002

* Item 9, "Non-Tenured Visits", was not entered. See Table 14.

PHASE II - Summary

The analyses presented in Phase II have been based upon a statistical examination of the data returned on 72 Phase II questionnaires. The questionnaires contained information on 36 vocational education programs identified as successful by the Delphi technique and 36 programs selected from the pool of programs not so identified.

Through simple correlation, t-test, and chi-square techniques it was determined that 20 of the 58 items suitable for such analyses correlated with, and differentiated successful programs from other programs at an acceptable level of significance. The 20 items were grouped under the six headings of Student, Student Visibility, Course, Instructor, Instructor Supervision, and Advisory Committee, and their relationship to identified success in vocational education was discussed. Of particular interest is the fact that the 20 variables statistically associated with success can be divided among five major topical groups. Within the limits of the questionnaire, while not exhaustive, these groups cover the major areas of school activity: Student, Curriculum, Instructor, Management, and "Trusteeship".

Discriminant analysis and multiple regression were used to further analyze the questionnaire data. Using discriminant analysis on various combinations of items we found that we could classify programs into two groups with a very high degree of success in replicating the classifications derived by the Delphi technique. Using the twenty "key" items, for instance, we were able to "correctly" classify 83 percent of the "successful" programs and 89 percent of the "other" programs. Multiple regression performed in a stepwise manner on the same twenty items showed that six items account for about fifty percent of the variance found in the 72 programs. These six variables should provide the nucleus for any future questionnaire designed to study the characteristics of successful vocational education programs. It is noted that these six variables came from five different sections of the questionnaire. It should also be noted that if we chose the seven items explaining the most variance (about 53 percent) we would have included a sixth section of the questionnaire.

The conclusion to be drawn from these results is that the concept of success in community college vocational education programs as identified by the Delphi technique is viable and multidimensional. Through the use of a well-designed questionnaire and appropriate statistical techniques, we have identi-

fied some of the dimensions. It has been found that success is dependent upon a variety of characteristics which span students, faculty, management, curriculum, credentialing, and advisory committees.

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APPENDIX 1

PLAN OF THE STUDY

Phase I

1971

August

1.0 Select project advisory committee

1.1 Select project director and secretary

1.2 Locate project director's office

1.3 Arrange with Napa College for fiscal management

September

2.0 Hold advisory committee meeting to brief committee members on project

2.1 Select consultant on study design and statistical analysis

2.2 Inform advisory committee of specific fiscal arrangements and provide for statistical report to the committee

October

3.0 Hold joint meeting of steering committee, project director, and consultant on study design

3.1 Develop preliminary model of Phase I and Phase II instruments

November

4.0 Conduct a planning conference including college research personnel, vocational education directors, and consultants on research design

4.1 Familiarize conference participants with project plan and objectives

4.2 Through Delphi process, identify and categorize vocational education deans opinion of success characteristics

December

5.0 Conduct educational audit of project

5.1 Modify instruments and procedures in accord with suggestions of conference participants and educational auditor

1972

January

6.0 Identify those who will serve on vocational education program evaluation panel in each community college

6.1 Review study plans with presidents and deans of instruction

6.2 Request cooperation of chosen panel participants through research officer or vocational education dean

February

7.0 Develop consensus on three "most successful" vocational education programs on each college campus

7.1 Categorize statements of success characteristics identified by panel members

Phase II

March

8.0 Develop Phase II plan for data collection

8.1 Modify data collection instrument in accord with statements made by Delphi panels

8.2 Randomly select three "other" vocational programs for comparison

April

9.0 Administer the Phase II standardized interview

May

10.0 Carry out analysis of data

10.1 Identify common characteristics of most successful programs

10.2 Identify characteristics of most successful programs which differentiate from other programs

10.3 Assemble findings in preliminary report

June

11.0 Hold project evaluation conference

11.1 Distribute copies of preliminary report to participants

11.2 Evaluate significance of findings and solicit recommendations for change

11.3 Schedule final educational audit

July

12.0 Present final report to Chancellor's Office and Research Coordinating Unit

APPENDIX 2

ACTIVITIES AND CONFERENCE OBJECTIVES FOR RESEARCH PERSONNEL

Thursday - p.m.

1. Understand the purpose of the local panel and assist in identifying panel participants.

2. Review and agree upon the final form of the instrument for developing panel consensus.

3. Review and agree upon the time, procedures for administration, and data collection methods in the consensus formation process.

4. Write a college plan for identifying "most successful" programs including the above characteristics.

5. Understand the purpose and nature of the reliability check of the consensus formation instrument.

6. Review the concept of operational definitions and understand the process to be used in data collection after "most successful" programs have been identified.

Friday - a.m.

1. Operationally define for processes of measurement, the criteria for successful programs developed by the vocational education deans.

2. Acquaint vocational education deans with the format to be used in data collection.

Friday - p.m.

1. With the assistance of consultants, agree on a specific research design to be used in carrying out the project.

ACTIVITIES AND CONFERENCE OBJECTIVES FOR VOCATIONAL EDUCATION DEANS

Thursday - p.m.

1. Identify tnd list characteristics of "most successful" programs on 3 x 5 cards.

2. Develop a project definition for vocational education programs.

Friday - a.m.

1. Rate the importance of characteristics identified on Thursday.

2. Review and understand the instrument to be used in identifying "most successful" vocational education programs.

3. Review and understand the methods of measurement to be used by the college researcher in identifying "most successful" programs and modify where necessary.

ACTIVITIES AND CONFERENCE OBJECTIVES FOR CONFERENCE CONSULTANTS

1. Assist the conference participants in carrying out the objectives of the conference.

2. Develop a specific research design to be used in carrying out the project.

3. Provide written report of conference proceedings.

EXPECTED OUTCOMES OF THE FIELD STUDY OF VOCATIONAL EDUCATION PROGRAMS

Minimum Expectations

1. Confirm presently held beliefs about the component parts of a successful vocational education program.

2. Give visibility to three locally identified "most successful" programs in each participating college.

3. Identify occupational programs which are most frequently cited by community colleges as most successful.

4. Identify occupational programs which are never cited as most successful.

Maximum Expectations

1. In addition to the above, dispel mistaken assumptions now held about relative importance of program characteristics.

2. Identify and make known effective practices which could be experimentally introduced into other college programs.

3. Make available to participating college vocational education deans a wealth of empirically derived management information.

NORTHERN CALIFORNIA COMMUNITY COLLEGE RESEARCH GROUP

PLANNING CONFERENCE AGENDA

The following activities have been scheduled for the project planning conference to begin "A Field Study to Determine the Characteristics of Most Successful Vocational Education Programs" in northern California community colleges. The conference will be held at Shasta College on October 28 and 29:

Thursday, October 28

1:00 p.m. - 2:00 p.m.	Meeting of the Steering Committee of the Northern California Community College Research Group
2:00 p.m. - 2:30 p.m.	Conference Orientation meeting in room 211 (attended by both vocational deans and research personnel)
2:30 p.m. - 4:30 p.m.	Identifying criteria thought to be associated with successful Vocational Education programs (attended by Vocational Education Deans only)
2:30 p.m. - 4:30 p.m.	Review and rehearsal of procedures to be used in developing program selection panels at participating colleges (attended by college research personnel only)
6:00 p.m. - 7:30 p.m.	No host cocktails and dinner at the Holiday Inn. Discussion of phase three of the Nor Cal attrition study (attended by all interested conference participants)

Friday, October 29

8:00 a.m. - 9:00 a.m.	Operationally defining criteria thought to be associated with successful Vocational Education Program (attended by college research personnel only)
8:00 a.m. - 9:00 a.m.	Assigning group ratings to criteria thought to be associated with successful Vocational Education Programs (attended by vocational deans only)
9:30 a.m. - 11:30 a.m.	Developing common definitions and methods of measurement (attended by vocational education deans and college research personnel)
11:30 a.m. - 1:00 p.m.	Lunch - Faculty-Student Dialogue Room in the Student Center (attended by all conference participants)
1:00 p.m. - 2:30 p.m.	Summary of Conference proceedings and discussion of specific data gathering technique (attended by college research personnel only)

The conference is scheduled to begin in room 211 of the library. Participants will be notified if there are any room changes.

APPENDIX 3

PHASE I DELPHI INSTRUMENTS

NAME _____

FIRST ROUND

Identify up to five vocational education programs conducted by your community college which you consider to be the "most successful." The list of vocational education programs is attached.

1. Use your own judgment as to what constitutes "success."

2. Please do not consult with others. Your independent judgment is desired.

3. For each program give a brief statement of reasons you think the program is successful. Write as many as you can think of.

List your selections for "most successful" vocational education programs below:

1. Program Title: _____
   Reasons for Success: (Please list each reason separately. List as many as you believe are important.)

2. Program Title: _____
   Reasons for Success: (Please list each reason separately. List as many as you believe are important.)

3. Program Title: _____

Reasons for Success: (Please list each reason separately. List as many as you believe are important.)

4. Program Title: _____

Reasons for Success: (Please list each reason separately. List as many as you believe are important.)

5. Program Title: _____

Reasons for Success: (Please list each reason separately. List as many as you believe are important.)

Participant Number_____

NAME _____

SECOND ROUND

The attached sheets identify vocational education programs nominated as "most successful" and lists the reasons why panel participants made their choice. Please read over each of these and the reasons indicated for their success and then using your best judgment, select the three which you consider to be the "most successful."

1. Program Title: _____

2. Program Title: _____

3. Program Title: _____

Participant Number_____

NAME _____

THIRD ROUND

On the following sheets the five vocational education programs identified as most successful by panel participants are listed along with reasons given by the panel participants for making their choice. What we would like you to do now is:

A. Look over the reasons given by panel participants for selecting the program.

B. Select the five reasons you would judge to be most important to the success of the program.

C. Rank the five statements in the blanks provided at the left of the page from 1 through 5, with 1 the highest ranking (i.e., place a 1 by the most important success criteria).

APPENDIX 4

GENERALIZED RESULTS OF THIRD ROUND DELPHI

1.0 STUDENT CHARACTERISTICS

1.1 MEETS ABILITY LEVEL

Provides opportunity for non-academic students.

A career program in which an average student can succeed.

Good for students inclined towards applications rather than theory.

Screening of students for the program.

1.2 MEETS INTERESTS OF STUDENTS

10 or 15 times the number accepted apply for the program - very popular.

Offers quick opportunity for male and female students to become professional (3 semesters).

Attracts students who might not be exposed to college.

Mature women can gain skills.

Many veterans like this program.

Natural interst of male students.

Program is popular enough to draw qualified students.

1.3 MEETS PREPARATION LEVEL OF STUDENTS

Availability of in-service training for career advancement.

Helps employees get promotions.

In-service training for local officers.

This meets a demand for retraining, where mothers, once their family is established, can supplement income and establish skills.

The program takes a student with little skill or knowledge in the field and produces a student with skills and knowledge in a sophisticated field.

1.4 MEETS FINANCIAL NEEDS OF STUDENTS IN SCHOOL

Virtually all fire science students are employed as paid or volunteer.

Has kept many from going on welfare.

Fills need for individual accomplishment in comparatively brief time.

1.5 ENROLLMENT POTENTIAL

Large growth of numbers of students in classes.

Heavy enrollment.

Heavy enrollment.

1.6 NUMBER WHO GET JOBS AND SATISFACTORY PERFORMANCE

High rate of student success in the field.

Near 100% placing of grads.

All graduates who wish to work as technicians have obtained jobs upon graduation, many prior to graduation.

Performance of graduates have established a reputation for excellence.

Great demand for graduates.

1.7 SUCCESS OF STUDENTS (LOW DROP OUT RATE)

Selection process appears to be excellent and instruction fine since attrition is very low.

High rate of success in program completion.

1.8 CONTRIBUTES TO PERSONAL QUALITIES

A program which gives success to students who have had few successes in the past.

Relevance of program to needs of students for self-esteem.

Development of pride in student, of preparation and need for work which candidate will be performing.

2.0 JOB MARKET CHARACTERISTICS

2.1 NUMBER OF ENTRY LEVEL JOBS

Should be openings in this field for a long time.

Growing demand because of the ever growing population.

In this field there seems to be more jobs than trained people.

There is an increased need for qualified mechanics.

2.2 EXPANDING JOB AREA

National interest and realization of need for stimulating and creative experiences for young children. Affords employment opportunities in rewarding work with young children for persons not interested in business, etc.

This is very important due to increased leisure time (T.V. etc.)

New profession.

Institutions are notably deficient in their preparation of appealing, appetizing and edible food: Students who complete this course will have learned the basics of all three of the deficiencies and how to overcome them.

Due to expanding medical facilities in community, more nurses as well as LVN's and medical assistants are needed.

2.3 ADVANCEMENT POTENTIAL

Graduates have been promoted in positions of higher responsibility far faster than any of us on the staff ever anticipated at the initiation of the technician training program.

Chances for advancement excellent.

2.4 RELATED OPPORTUNITIES

General training that is well-founded could eventually lead to furthering the potential of the student after becoming employed to many directions, medical, legal, constr. etc..

Provides opportunities for other professions who need to become acquainted with (and use) computers.

Often proves a stepping stone to another career.

2.5 SALARIES AND WORKING CONDITIONS

Has semi-professional status.

Working conditions on the job.

High wage scale.

Gives one professional status.

One is able to set his own working hours.

Excellent salaries.

Good pay for young women.

Good atmosphere to work in.

2.6 GENERAL APPEAL

Data processing, advertised as a glamor industry, caused many people to request career in data processing.

Glamor of job as it relates to nursing.

2.7 COMMUNITY VALUES

Promotes strong community and area interest as a natural meeting ground between residents and college.

Values of community favor law enforcement.

Both students and local industry benefit from program.

Program meets community need.

3.0 CHARACTERISTICS OF INSTRUCTION

3.1 QUALIFICATIONS

Outstanding staff - wide background.

Dedicated faculty.

Highly qualified staff.

A very strong teaching staff.

3.2 RELATION TO VOCATION

Cooperation with law enforcement agencies in developing curriculum.

Good industrial contact by instructors.

Good instructor contact with community.

3.3 METHODOLOGY

Systematically trains students for, and to adjust to, very demanding occupation.

Interesting class material/student projects his roles.

Excellent intern program.

Lack of instructor pressure seems to allow those students with motivation necessary for successful job placement to emerge and take full advantage of equipment as well as knowledge of instructor.

Practical experience in running a police station, patrolling an area with patrol cars and on foot plus classroom study.

3.4 MOTIVATION OF STUDENTS

Enthusiasm of students taking program.

Espirit de corp by participants (togetherness in program).

High motivation of students enrolled in program.

Motivation is high because job promotion is dependent upon the acquisition of either a certificate or degree.

3.5 ENTHUSIASM OF STAFF

Instructors highly enthusiastic.

Very cohesive unit.

3.6 INTEREST OF STAFF IN STUDENTS

Instructors take personal interest in their students.

Instructors willing to help with counseling and further education.

The staff assists the student in finding employment and does follow-up on graduates.

Students are readily placed since community needs for highly skilled secretaries remains great and the staff takes an active role in student placement.

Good student-faculty relations.

Students believe they receive outstanding help and support for the instructional staff.

Instructors care about students.

Instructor is highly respected and relates to students.

Instructor effort in placement.

4.0 CHARACTERISTICS OF PROGRAM CONTENT

4.1 RELEVANCE OF PROGRAM TO JOB REQUIREMENTS

Geared to what students and employees want.

Courses offered currently applicable to business and industry.

Local business is involved in providing work related experience stations for students.

Practical work experience.

Orientation of student to job.

4.2 FLEXIBILITY

Does not limit the number of students in program.

Day and evening offering to suit student needs.

Excellent option of classes and concentrations.

Certificate of achievement at various levels.

Worker may enter labor market, leave for period of time and re-enter without great deal of difficulty.

Transferability to four year technical program if decide to continue.

Many short term possibilities for updating skills.

Curriculum is broad enough to prepare students for a variety of jobs.

Program is flexible - transfer or employment.

Employment possibilities for various levels of training and skills.

4.3 STANDARDS

Graduates are well trained - do well on national and state board exams.

Offers license.

A prescribed course of study which must be met by students.

Requirements of anatomy and physiology and prerequisite of chemistry insure better students.

4.4 FEW COURSES LIKE IT

Unique program (not widely available).

4.5 GENERAL

Excellent program.

Program has grown markedly.

Programs well organized.

4.6 EXTENSIVE, COMPLETE

Full program. I.E., Courses from beginning accounting through auditing.

Range of law enforcement subjects and courses is complete.

Program depends highly on academic areas for necessary support courses.

The program consists of an intense block type of training program aimed at specific tasks and job descriptions.

5.0 FACILITIES AND EQUIPMENT

Excellent modern computer facilities.

Excellent firing range facility.

6.0 SUPPORT

Indicates college's interest and ability to initiate new programs and achieve immediate success.

Promotes interest.

Promotes college in the area as it appeals to the people as a "worthy" investment of tax dollars.

6.1 SUPPORT OF COMMUNITY, INDUSTRY AND BUSINESS

Support from hospital and medical personnel.

The various training directors for all levels of government service support the program.

Favorable comments from local industry - contributions of equipment, etc.

The Board of Realtors supports the program of classes.

6.2 ADVISORY COMMUNITY SUPPORT

Very good advisory committee.

6.3 ADMINISTRATIONL LEADERSHIP AND SUPPORT

Coordinator is excellent.

Received strong administrative support.

Good administration of the program.

Superior faculty leadership through head of department.

Leadership

6.4 FACULTY SUPPORT

Established program that enjoys faculty support.

6.5 FINANCIAL SUPPORT

Inexpensive program relative to cost of program offered at UCLA and Pacific colleges.

Well [illegible]ed by allied Health Grants.

Good budget support for currency with "state of the art".

6.6 REPUTATION AND MEDIA SUPPORT

Good reputation.

Campus has created an environment that does not downgrade the program.

Campus police publicize their own activity by the role they play.

bk
6/17/72

APPENDIX 5

PHASE II QUESTIONNAIRE

Program Identification

1. Name of the Program _____

2. Number of units required in the major _____

3. Number of years the program has been offered on campus _____

4. Does this program have a state licensing or certification procedure? Yes____ No____

5. What is the ratio of males to females in the program? _____

6. Is your best job market within the college district or outside the college district? Within____ Outside____

Instructional Staff

1. In the occupational courses specified in the catalogue for _____ (name of the program), how many different instructional staff members are involved in teaching required courses? (Check the appropriate blank)

1 instructor	_____	4 instructors	_____
2 instructors	_____	5 instructors	_____
3 instructors	_____	More than 5	_____

[Question 1 is asked to determine if a relationship exists between the number of staff and the quality of the program]

2. How many instructors teaching in core courses for this occupational specialization have had full-time experience in the field?

Number of instructors with experience in the past 2 years	_____
Number of instructors with experience in the past 4 years	_____
Number of instructors with experience in the past 6 years	_____

3. How many instructors have had part-time experience or summer experience during the 1971-72 school year?

Number having part-time experience during regular school year	_____
Number having summer experience	_____

Equipment and Facilities

1. In the opinion of the staff member being interviewed, what are the five major pieces of equipment necessary to train students for jobs in this occupational specialization? Please list on the following page.

(Essential equipment continued)

_____ _____

_____ _____

_____

2. How many of these five essential pieces of equipment are unavailable or in need of replacement in your training facilities?

_____(number)

3. In the opinion of the staff member being interviewed, is the space provided for students in the training facilities adequate to provide essential training?

Yes_____ No_____

If an inadequacy exists, please be specific as to the course, the facility, and the type of inadequacy.

_____

_____

_____

4. Is all the equipment required in the program provided by the college or must some of it be provided by the student?

All provided by the college _____

Some provided by the student _____

If some equipment is provided by the student, describe the equipment and the cost to the student.

_____

_____

[There is some indication that programs which require the student to commit himself to the program to the extent of providing some of his own equipment may have the effect of only selecting students with a serious intent to pursue the major and, therefore, be more successful than programs without the requirement.]

5. Are off-campus facilities regularly used in the training of students for this occupational specialization?

Yes_____ No_____

Please select the alternative which tells how off-campus facilities are used:

Used in a regularly scheduled class _____

Used irregularly for work experience students _____

Used for field trips _____

Program Management

1. Who has major responsibility for this vocational program? On the statements below of activities associated with program management, write the title in (vocational education dean, division chairman, department head, instructor) of the staff member who performs each of the activities. (Draw a line through any activity which is not performed.)

Management Activity	Responsible Person
A. Calls staff meetings of instructors teaching in the program	_____
B. Develops a budget for this occupational program	_____
C. Interviews prospective teaching staff	_____
D. Evaluates instructors	_____
E. Orders instructional materials and supplies	_____
F. Iniates curriculum additions or revisions	_____
G. Develops a class schedule	_____
H. Makes teaching assignments	_____
I. Calls advisory committee meetings	_____
J. Chairs advisory committee meetings	_____

[This question is asked to determine the specific roles taken by staff members in most successful programs.]

2. Are classroom visitations made regularly by supervisory personnel? Yes____ No____

   A. If classrooms are visited, how often and by whom?

	How Often?	By Whom?
Are tenured teachers visited?	_____	_____
Are non-tenured teachers visited?	_____	_____

Curriculum and Class Scheduling

1. Must this occupational program be entered by the student in either the fall or spring, or may he enter either semester?

   Fall only _____

   Spring only _____

   Either semester _____

2. How many students declared this occupational program as a college major in the 1970-71 school year?

_____(number)

3. Is a specific semester-by-semester course sequence made available in writing to the student (college catalogue or hand out sheet) upon entry to the program or are courses described only in terms of requirements?

Course sequences available _____

Course requirements only are identified _____

4. Is an entry course required of or recommended for all students? That is, is there one course which is required or recommended to the student in his first semester which orients him to the vocational program?

Entry course required _____

Entry course highly recommended _____

No such course _____

5. Is a final or wrap-up course required of or recommended for all students? This would be a course normally taken in the semester of completion of the occupational program which reviews what has gone before and prepares the student for job entry.

Final course required _____

Final course recommended _____

No such course _____

6. Are the courses for this major scheduled as a block, where in a given semester the student must take all the prescribed course work, or scheduled individually with some degree of student selection?

Courses are scheduled as a block _____

Courses are scheduled at student selection _____

7. Where did the last two curriculum changes for this occupational program originate and when did they take place? (Please show who was most instrumental in the change. By change, we mean here the addition of a new course, the modification of an existing course, the dropping of a course from the curriculum, a change in the course sequence, or a change in the units and hours.)

Change Originated	Change Made	Date
With one or more of the instruction staff	_____	_____
With the department head or division chairman	_____	_____
With the advisory committee	_____	_____
With the counseling office	_____	_____
Other source	_____	_____

Recruiting and Placement

1. Do members of the instructional staff in this vocational major regularly visit high schools in the college district?

   Yes_____ No_____

2. In your opinion, do members of the counseling staff specifically discuss this vocational major on regular visits to high schools in the service area?

   Yes_____ No_____

3. Are brochures distributed regularly to high schools and other student sources describing this occupational program?

   Yes_____ No_____

4. Is publicity regularly released through the news media singling out and describing this vocational program?

   Yes_____ No_____

5. Does the student enrolled in this program have one or more means of being recognized as a member of this particular occupational training group? Check each of the following alternative means of recognition which typify the occupational student.

   a. Wears a uniform or work gear which is identifiable _____

   b. Takes most of his courses in the same general area _____

   c. Has most of his classes with the same students _____

   d. Eat lunch together with other students in the training program _____

   e. Take frequent field trips together with other students _____

   f. Has several classes where he works closely together with the same students in a lab or work experience situation _____

   g. Belongs to a club to which other students training for this occupation usually belong _____

   h. Other activities which identify the student with the program not listed. Please specify. _____

   _____

   _____

6. Does this occupational program have prerequisite course requirements which limit student enrollment? If so, please describe briefly.

   _____

   _____

   _____

   _____

7. If no screening procedures are used, how are students treated who enter the program without appropriate skills to profit from instruction? In other words, what specific remedial provisions are available to entering students?

_____

_____

8. Are prospective students interviewed prior to admission to this occupational program?

Yes_____ No_____

9. Are students in this occupational program given specific assistance in getting a job upon completion of the program by any of the following services?

A. By the college placement office. Please describe the service rendered._____

_____

B. General assistance from the instructional staff. Please describe the service rendered._____

_____

C. Assistance from a specifically designated staff member. Please describe the service reudered.

_____

D. Assistance from members of the advisory committee. Please describe the service rendered.

_____

E. Other assistance not mentioned._____

_____

10. Does the possibility for spinout jobs exist with this vocational program? That is, does the student qualify for jobs through partial completion of the training program? Please specify the job title and number of semesters needed to quality for the job.

Job Title	Semester Qualified
_____	_____
_____	_____
_____	_____

Advisory Committee

1. Does this program have an advisory committee which met during the 1971-72 academic school year?

Yes_____ No_____

2. Does this advisory committee meet:

Monthly	_____
Semester or quarterly	_____
Yearly	_____
Upon call	_____

3. How many members are on the advisory committee?

_____(number)

4. Is the advisory committee responsible for more than this one occupational program?

Yes_____ No_____

5. How many members of the advisory committee are currently employed in or are supervisors of personnel in this occupational specialization?

_____(number)

6. Did this advisory committee propose or review the last two changes made in the educational curriculum of this occupational program prior to the change?

_____

_____

7. How many times in the past year have advisory committee members assisted in student placement?

_____

_____

There is some indication that the strength of a program is closely related to the community support provided by an advisory committee. These questions are designed to determine the quality of support provided by the advisory committee.

APPENDIX 6

VOCATIONAL EDUCATION DEANS DESCRIPTION OF
PROGRAM CHARACTERISTICS ESSENTIAL TO SUCCESS

_____1. Student availability

_____2. A program with student appeal

_____A student group or class that perceives the occupation as satisfying and reasonably exciting

_____How student feels about the program

_____Program attracts students

_____3. Recruitment of appropriate students

_____4. A degree of "screening" for entering students

_____Permit students to start in programs at the level that presents a challenge to them

_____Students screened for capability

_____Students placed in proper place in program

_____Motivation of students

_____A student motivated to learn by active involvement

_____Students highly motivated by an outside force (Must complete course or program in order to get pay raise or promotion)

_____Student organizations in the specific occupation for building group enthusiasm

_____Have the student and program become a part of student activities in such ways as clubs, dances, publications

_____5. Student proficiency

_____6. Successful job placement

_____7. A job at the end of the program

_____Placement

_____High initial placement rate

_____8. Good program development

_____9. Specific measurable objectives

_____A curriculum that leads to competence with defined objectives

_____10. The program itself - its relevance and need

_____Job availability

_____Need

_____An instructional program that provides meaningful and satisfying class activities

_____Curriculum content reflects what goes on in industry

_____11. Student oriented curriculum

_____12. A program that is not "bogged-down" with irrelevant pre-requisites that will take a semester or year to complete, or that are unnecessary but nice additions

_____13. Saleable skills

_____Saleable skills for students who complete only a portion of program as one semester, two semesters, etc.

_____Student employed in field trained for

_____Students trained for jobs with possibility of employment

_____Student employed in field other than one trained for

_____PGM educates-trains student to obtain job (which exists)...A job student really wants to obtain

_____PGM with useful content (will help student pursue and be successful with particular avocation)

_____14. Program flexibility

_____More than one entry place for students tc enter program

_____A program that will provide a saleable skill in stages. The student may become trained in a year or less for entry level employment and that may improve on this skill after employment

_____Wide range of related opportunity, e.g., career ladder or spinoffs

_____Transferability - Job ladder for when job market is bad

_____Educational experience included in program. Versatile curriculum allowing for career adjustments

_____A good program is one that has built-in flexibility-can be easily phased out, or phased in. Part-time people-outside resources

____15. Growth in program

____16. An instructional area that resembles a job station

____17. A laboratory that demonstrates an atmosphere for learning

____18. Staff involvement in recruitment, counseling, placement

____19. Staff involvement

____20. Individuals guidance help available to students in program

____21. Advanced placement procedures - articulation with high schools

____22. Work experience offered in conjunction with program

____Work experience education

____23. An active interested advisory committee

____An active advisory committee

____Advisory committee resource groups

____Advisory committee determines content (realism)

____Advisory committee "clout" in employing community

____24. Close relationship with the appropriate industrial community involved

____A strong and meaningful tie-in with the consumers of the saleable skill produced by the program: a. placement b. advisory committees

____25. Positive news media information

____Good PR program

____Feedback to class from students employed in the industry

____26. Industry and community support (involvement)

____Community participation and support

____27. Administrative support

____Philosophy and goals of college consistent objectives of vocational programs (including economic com.)

____District philosophy

____Cooperative board and administration

____Support

_____28. Well qualified, enthusiastic staff (instructional)

_____Well qualified instructional staff with background and wide acquaintance with labor management personnel in occupation

_____Strong and dedicated faculty and coordinator who believes in what they are doing

_____Staff

_____An enthusiastic, competent, and innovative instructor

_____Technically qualified student oriented instructor

_____The instructor

_____Outstanding instructional staff

_____A teacher who emulates professionalism

_____Instructional staff, professional qualifications, personal qualifications

_____Occupational experience of instructors

_____29. Student/instructor ratio

_____Teacher/pupil ratio maintained at a level consistent with good instruction

_____30. Up-to-date equipment that reflects that used in industry

_____Facility that has been developed by representatives of the industrial community

_____Flexible facilities

_____Adequate budget-facilities

_____31. Good administrative management

_____32. Advice

APPENDIX 7

NORCAL VOCATIONAL EDUCATION STUDY

First Audit Report

Presented to
Project Advisory Committee
January 14, 1972
American River College

Ben K, Gold
(Project Auditor)
Director of Research
Los Angeles City College

NORCAL VOCATIONAL EDUCATION STUDY
First Audit Report

1. INTRODUCTION

The remarks that follow are based upon observations made at the Planning Conference held at Shasta College on October 28 and 29, 1971 and upon examination of written materials furnished to me since that time. It is obvious that more than this is needed to prepare a thorough analysis of the project to date.

Nevertheless, it has been enough for me to offer some opinions and some suggestions. As I understand my assignment as Project Auditor, it is to stand aside and look at the project from some distance, in the hope that observations from this perspective might assist those intimately involved in the detailed activities to see a little more forest and a little less trees.

It is in this spirit that I offer this report. I make no claim that it is unbiased. To the contrary, I think I am as anxious as any of you that the project succeed.

Your Chairman has suggested that this report should not be exhaustive. Therefore, on the basis of my observations and reading, I should like to submit for your consideration my impression of some of the strengths and weaknesses of the project to date, and some recommendations for activities in the coming months. I shall list ten strengths, ten weaknesses, and ten recommendations (none in any priority order).

STRENGTHS OF THE PROJECT

Let us consider first some of the strengths of the Project.

1. Surely one of the great strengths of the project is the NORCAL research group itself. The talent, enthusiasm and spirit of cooperation found in this group, already clearly demonstrated, assure that much of value will result.

2. Another great strength of the project is the accomplishment of getting Vocational Education deans and institutional researchers from over twenty colleges to spend two days together in mutual discussions. Benefits accruing from this interchange almost guarantee the success of the project, should all else fail.

3. I think the Planning Conference itself should be listed as one of the strengths of the project. Not only was the combined meeting of Vocational Education deans and researchers an accomplishment, the planning and operation of the Conference were clearly first-rate. The objectives of clarifying purpose, instilling enthusiasm, and receiving inputs were met in good style.

4. The positive approach incorporated into the project is certainly one of its prime assets. Too often the question "What's wrong with it?" is asked, too seldom the question "What's right about it?" It is not only refreshing that you are looking for outstanding vocational programs, it also will undoubtedly enhance cooperation.

5. Another strength, related to the one just mentioned is the visibility the project will give to vocational programs. I am sure you find, as I do, that even in this enlightened age there exist a large segment of the population who are unaware of the community colleges' fine vocational programs. It is to be hoped (and expected) that reports emanating from this project will significantly reduce the size of that segment of the population.

6. Institutional research is often criticized for not having enough direct effect on management decision-making. One of the strengths of this project is its potential for producing a sizable impact in this direction. Plans for providing college administrators with information of real pragmatic value to them are certainly to be commended.

7. The project proposal was obviously written with considerable care and forethought. Its clarity and structure are to be commended. In particular, the detailed time scheduling should prove of much help to all concerned.

STRENGTHS OF THE PROJECT (continued)

8. Let me now comment upon two items from the materials I have received since the conference. First, the set of Guidelines for Phase 1 prepared by the Project Director show depth of thought and general clarity of organization. They should prove of much help to the individual college personnel as they proceed with the identification of "most successful" programs.

9. As a second item from the written materials, the report from Shasta College on the reliability check for panel convergence is quite impressive. It seems to me sufficient to give the green light to prompt panel formation and Round One of the Delphi procedure.

10. As a final comment on strengths of the project, let me congratulate you on your choice of a project director. His experience with management processes, particularly with Delphi procedures, his willingness to assume and complete detailed and arduous tasks, and his general spirit of cooperation all contribute greatly to the asset side.

WEAKNESSES OF THE PROJECT

The above list of strengths of the project is certainly not exhaustive, but simply the ten that most stand out, to my mind, at this juncture. Every project has weaknesses. Let us now consider some of these. As you will note, some that I will list are closely related to some of the listed strengths, by necessity.

1. The first weakness I should like to mention is an almost necessary outcome of the first strength listed above. While two dozen or more researchers working together can accomplish things a single person cannot, the reverse is also true. I know of no way for a group of twenty or more people to carry out the details of a research project. It is conceivable that some NORCAL members, excited about the project, may with all good intention place an impossible burden on the Director. It seems to me important to underline the obvious fact that the project has one director, and that, once he has his tasks clearly formulated by this Advisory Committee, any other direction of the project should be vicarious.

WEAKNESSES OF THE PROJECT (continued)

2. Although mentioned above as a strength, the conference meeting of vocational education deans and researchers could ultimately become a weakness. It seems clear that the deans are highly supportive of the project and that at the conclusion of the project they will be furnished a wealth of information. Between the time of identification of the "most successful" programs and the preparation of the final reports I see little communication with the deans. Surely they can provide more input than they had the opportunity to provide at the conference. I suspect their ego will require that they have the opportunity.

3. Although the Project Director has many desirable attributes as described above, his lack of experience in community college research endeavors must be listed as a weakness of the project.

4. I am somewhat concerned about the overall scope of the project. The potential problems in data collection and analysis, especially for the phases of characteristics differentiation, are staggering. I think more thought needs to be given to delimitation.

5. I feel there is some confusion (possibly just in my own mind) between characteristics of a program and criteria by which a program is judged successful. I note in reading the Delphi results from the Shasta pilot study that more than one respondent indicated that they thought a program was successful because entrance requirements "insured good students," while others indicated as a reason for success the fact that the program "takes students with little skills or knowledge and produces a student with skills and knowledge in a sophisticated field." Do we have a philosophical problem here? A semantics problem? A research problem? The project proposal states that the purpose of the project is to "identify and make available for local college use criteria associated with most successful vocational education programs ...." Should the term be characteristics?

6. As mentioned, I think the Phase I Guidelines are well done. However, Phase I as indicated does not coincide with Phase I in the proposal. It is true that the first phase in the proposal is concerned with data analysis but some confusion could result. What is to be Phase II? or III? or ?

7. Again referring to the Phase I Guidelines, while instructions generally seem carefully thought out and clear, I suspect that more instruction on collecting and analyzing the data for the Delphi rounds is needed for those researchers who have had no experience with the technique.

WEAKNESSES OF THE PROJECT (continued)

8. Although understandable at this point in the project, I think relatively too much time and energy have been spent developing guidelines for panel selection, Delphi procedures and identification of "most successful" programs. Not enough thought has been given to methodology for identifying and distinguishing among characteristics of good programs in general and characteristics specific to particular programs. I felt this was a weakness of the planning conference, and have not seen enough in materials received since that time to allay my fears in this regard.

9. In this same vein, I think the proposed instruments for eliciting opinions regarding presence of certain characteristics (furnished to me by the Project Director), are inadequate in themselves as data collecting instruments. While the proposed questionnaire items reflect considerable thought and many (if not most or all) of them appear appropriate, my criticism at this point is twofold: (a) analysis and further use of the proposed collected data are not spelled out, and (b) I would hope that you will not settle for opinionnaire type data exclusively.

10. As a final point in discussing project weaknesses, I would mention the stringency of the time schedule. It appears that you are now about a month behind schedule with what appears the most arduous part of the project still ahead. It appears that the time schedule will have to be expanded, or the project delimited even more severely than suggested above.

RECOMMENDATIONS

Let me now offer some specific suggestions for some activities in the near future. I understand you are to have a meeting of the NORCAL researchers on January 21. That might be a very good time to consider some of the items I will mention.

1. Make sure all college representatives know precisely how to collect, analyze and report the data for each round of the Delphi process.

2. Plan a one or two day meeting including the Project Director, the NORCAL Chairman, the design and analysis consultants and possibly one or two other experienced NORCAL researchers to consider types of measures appropriate to identifying and distinguishing among program characteristics and the general problem of collection and analysis of the resulting data. I would suggest that consideration be given specifically to the practicality of the measure, as well as to the standard virtues of reliability, validity and relevance.

RECOMMENDATIONS (continued)

3. In this same regard (measurements for characteristics), be sure that plans for data analysis -- choice of techniques, computer utilization, formats for reporting, etc. -- are thought through carefully in advance, so that data collection will be appropriate to the later analysis.

4. I note a wealth of ideas regarding program characteristics springing from the Delphi procedures used in the Shasta run-through. Be sure that plans for measurement of characteristics are flexible enough to incorporate similar ideas from other institutions.

5. Give some thought to the difference between criteria associated with a program and characteristics of a program. (To quote Webster -- criterion: a standard for judging; characteristic: that which distinguishes). Also give some thought to characteristics (criteria?) applicable to all programs and those applicable only to certain specific programs.

6. Plan carefully the selection of comparison programs not identified as "successful." I have not seen in writing a specific outline as to how this will be done. The major reason for including it here is to suggest that possibly this portion of the project can be delimited rather drastically without too much damage to the overall project. This of course assumes the method is designed carefully with generalizibility of findings kept in mind.

7. The Vocational Education deans are supportive of the project. Take advantage of this and tap their knowledge, possibly including some interviewing.

8. Start giving thought to the format to be used in presenting information to administrators. While some sophistication is probably in order in the methods stages of the study, findings must be presented to administrators in a form they can read and understand, and in such a way that the information will make sense to them. As the old proverb puts it, if one has to search for a needle in a haystack, it isn't likely he'll be able to make a stitch in time.

9. I suggest you rethink the time schedule for the remainder of the project. A careful review at this point should indicate how much additional delimiting should be done in order to reach the major objectives of the project on schedule.

10. Finally, let me urge you to give all the support, both moral and physical, you can to your Project Director. He will have a very busy Spring.

CONCLUSION

This report has become more wordy than I originally intended, and I apologize for this. I hope no one will infer from this that I have an overall negative feeling about the project. To the contrary, if I had to summarize in one word my rating of the project to date, that word would have to be "great."

Let me reiterate that the above remarks are observations from a distance. Where I am on the mark, please give appropriate consideration; where I am off, please ignore.

Thank you for permitting me to audit your project.

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NORCAL VOCATIONAL EDUCATION STUDY

SECOND AUDIT REPORT

Presented to
Project Advisory Committee
July 31, 1972
City College of San Francisco

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(Project Auditor)
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NORCAL VOCATIONAL EDUCATION STUDY
SECOND AUDIT REPORT

INTRODUCTION

This is the second and last Audit Report of the 1971-72 NORCAL Vocational Education Project Study. The first report covered the period from inception of the project through December 31, 1971 and was presented to the Project Advisory Committee at their January 14 meeting held at American River College. This second report covers the period from January 1, 1972 through the Evaluation Conference held at Shasta College on June 19 and 20.

Since considerable efforts were to have been made following the Evaluation Conference and results of these efforts were not available in time for the preparation of this report, the Committee is advised that the following remarks should be considered with this fact in mind.

I should like to categorize my remarks today into five areas: (A) Progress in Phase I, (B) Progress in Phase II, (C) the Evaluation Conference, (D) some general comments, and (E) some recommendations for future activities.

A. PROGRESS IN PHASE I

Although running 2-3 months behind the time schedule as outlined in the project proposal, Phase I of the project appeared at the time of the Evaluation Conference to be nearing completion in good style.

Following are some more specific observations:

(1) I was impressed by the concern for reliability of the Delphi methodology. The addition of two features (the dual panels and the probability formula) not required by the proposal gave additional weight to the already established fact that the project leaders will not settle for unsubstantiated conclusions in the study.

(2) The notion of calculating the probability of two panels coming up with the number of common identifications that they did is creative and should be useful in convincing vocational education deans and others that the Delphi procedure is reliable. However, there is some doubt as to the correctness of the formula. I trust that this will be checked (as per letter of June 28 to the NORCAL chairman).

(3) The process for identifying the comparison programs (not most successful) is not clear. According to the proposal, for each program identified as "most successful," a random sample of colleges which offer this program and did not have it selected as "most successful" will be used. The preliminary identifications indicate some of the "not identified" to be completely different from those in the "most successful" list. If some method other than the random assignment mentioned above is to be employed, certain controls and cautions are in order.

(4) The "Tentative Ranking of Success Characteristics" seemed an excellent approach to obtain ideas to pursue in Phase II of the project. However, the "mean" figures are confusing and may tend to give the impression that the data level is stronger than it in fact is.

B. Progress in Phase II

The progress in Phase II at the time of the Evaluation Conference was obviously limited by the delays encountered in Phase I. However, the accomplishments in Phase II by that time indicate clarity of general direction and that the analysis portion of the project pertaining to Phase II is in good hands. A few more specific observations:

Progress in Phase II (continued)

(1) The choice of an interview with a "successful program" director seemed a wise choice. The instrument used, although somewhat awkward from a keypunching standpoint, showed care and thoroughness in its design.

(2) The analysis of the instrument, using biserial and point biserial correlations, was creative and competently performed. A note of caution in reading too much precision into this type of statistic is in order, however. Correlations based on dichotomies are clever and are useful, but have large standard errors. Conclusions reached from this type of analysis with no other substantiation should be interpreted with caution -- as hypotheses for further investigation, rather than as established facts.

(3) Although, as mentioned, the direction for Phase II seems clearly established and the initial instrument appears to have merit, there is need for data less subjective in character. Initial findings from Phase I suggested that more objective data about the college, the faculty, the students, and the community might be useful in providing management information to deans. Although I realize the time problems, I hope this feature of the project will not be buried and forgotten.

(4) I have some concern about differentiation between characteristics of successful vocational education programs in general and characteristics applicable only to certain specific programs or to certain categories of programs. For example, looking at some of those indicated in the preliminary analysis as possibly having significance, "number of instuctors with full-time experience in the field" could conceivably be a general characteristic while "ratio of males to females" is obviously more important in certain programs than others. Possibly some type of factor analysis would be helpful in this regard, but I should think that a subjective categorization by a researcher knowledgeable of program contact and objectives, followed by analyses of sub-groups compared with the total would yield useful information.

C. The Evaluation Conference

The Evaluation Conference, although not as well attended as the earlier Planning Conference, again demonstrated the dedication of the college researchers and vocational education deans to produce a study of real value to the colleges. Incompleteness of data reduced somewhat the effectiveness of the conference in evaluating findings of the project; nevertheless, the conference appeared to be very helpful in obtaining consensus as to directions for concluding the project as approved and funded and for continuing efforts beyond that point on some of the phases of the project that could not be completed in the allocated time.

A stimulating feature of the conference was the inclusion of reports from representatives of programs deemed "most successful." These presentations indicated clearly that if findings of the project do not rank enthusiasm, competence and dedication of program personnel high on the list of characteristics of successful program, the entire study will be suspect.

D. Some General Observations

Let me now offer a few comments about the project in general.

(1) My first general comment would have to be that, in spite of frustrations of time delays, some personnel problems, communication difficulties, and other assorted factors which plague any endeavor of this type, the project must, in its overall context, be rated outstanding, another fine accomplishment of the highly regarded group of NORCAL researchers.

Some General Observations (continued)

(2) You may recall that in my earlier report to you I suggested that should all else fail, the project would have to be rated a success because of the accomplishment of getting deans and researchers to get together. The above premise was certainly not valid, but observations at both Conferences reinforces my earlier conviction that the interchange between the groups brought about by this project will have value long after the project is completed.

(3) I would certainly be remiss if I did not in this report point out to you my admiration for the performance during the year of your chairman, Walter Brooks. His conceptualization of the project, his ability to sense at what point and in what direction to move, his ability to communicate ideas, his talent for synthesizing and crystallizing group thinking, his reasoned calm at times when panic seemed in order, and above all his dedication and spirit of cooperation are in large measure responsible for the success of the project.

(4) I should also like to indicate my impression of the contribution of Dr. William Morris. As a representative of the funding source, his attitude could have been one of monitoring and control. To the contrary, his participation throughout the project was consistently one of helpfulness and support and assisted greatly in the creation of a climate in which those involved could perform most effectively.

(5) Although I must confess to a feeling that some of its work (such as revision of budget classifications) could have been better accomplished by a small sub-committee, (but realizing the problems of communication and transportation and therefore discounting this feeling), I think each member of the Project Advisory Committee is to be highly commended for his (or her) generous contributions of time, talent, and energy.

(6) Among these accolades, let me insert one note of caution about a possible outcome of the project which should studiously be avoided. It is to be hoped that programs chosen as outstanding vocational education programs will receive positive publicity and much needed exposure. It is equally to be hoped that the logical inverse of this statement will not take place. Every caution should be taken to insure that programs not selected by the processes used in Phase I of the project are <u>not</u> branded as inferior.

E. Recommendations

Let me close with some suggestions from this vantage point for future activities. I think most of these recommendations can be carried out, at least to some degree, whether or not a continuation of the project is refunded.

(1) Continue to investigate more objective measures for identifying characteristics of successful programs. Be sure data is collected in a format amenable to appropriate analysis.

(2) Consider some alternative analyses to the dichotomous correlation technique (for example, divide data into two groups -- successful and non-successful programs --, calculate appropriate statistics and make tests for significant differences).

(3) Study more thoroughly the Phase I Delphi rounds, in particular reasons for major shifts of selections.

(4) Prepare findings in form for use by college administrators, being careful not to denigrate non-selected programs.

(5) Continue investigations of programs which were selected in some colleges, passed over in others. Report any findings from this endeavor with considerable care.

(6) Continue to strengthen the working relationships established between deans and researchers.

(7) Pat yourselves on the back a little. You deserve it!

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