DOCUMENT RESUME

ED 081 419 JC 730 203

AUTHOR	Heinkel, Otto A.
TITLE	Development of Management and Information System Skills for Vocational Education in California Community Colleges. Final Project Report.
INSTITUTION	California Community Colleges, Sacramento. Office of the Chancellor.; San Diego Community Coll. District, Calif. Research Office.
REPORT NO	R-73-1
PUB DATE	72
NOTE	158p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Community Colleges; Leadership Training; *Management Education; Management Systems; Models; Post Secondary Education; Problem Solving; Professional Continuing Education; Program Evaluation; Skill Development; *Systems Approach; Technical Reports; *Training Techniques; *Vocational Education
IDENTIFIERS	*California

ABSTRACT

Fifteen California community colleges participated in a program designed to develop and demonstrate a training and internship model that would provide skilled, experienced project managers, especially at the levels of dean and assistant dean, for occupational education in the state's community colleges. Research was conducted to produce a management system and procedures training model with resource materials to serve as an operational guide for a continuing program to develop professional management skills in occupational education leaders. During the initial year of the study, 18 occupational education leaders received training in producing comprehensive system plans for accomplishing practical projects compatible with state and local priority needs. Instruction was provided by a panel of university management specialists and independent consultants, and emphasized product development rather than theoretical training. The consulting team focused upon system approach concepts of product development, with the participants' skill development as a spin-off. A continuous and objective assessment of participant feedback reflected the program's initial success. Through data collection, it was found that the project participants rated the consultant team highly. Management functions were accomplished, and the project met its objective of producing 15 skilled occupational education leaders. (Author/DB)

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SAN DIEGO
COMMUNITY
COLLEGES

CITY
MESA
EVENING
MIRAMAR

SUPERINTENDENT
Thomas L. Goodman

DEPUTY
SUPERINTENDENT
Charles W. Patrick

BOARD OF TRUSTEES
Louise S. Dyer
Gene French
Richard L. Johnston
Richard F. Kreile
George W. Smith

RESEARCH

DEVELOPMENT OF MANAGEMENT AND INFORMATION SYSTEM SKILLS FOR VOCATIONAL EDUCATION IN CALIFORNIA COMMUNITY COLLEGES

PROJECT DIRECTOR
Otto A. Heinkel

REPORT R 73.1

1972

835 TWELFTH AVENUE
SAN DIEGO,
CALIFORNIA 92101
(714) 236-1331

JC 730 203

OFFICE

Otto A. Heinkel, Director
Dean G. Klampe, Assistant

FILMED FROM BEST AVAILABLE COPY

ABSTRACT

DEVELOPMENT OF MANAGEMENT AND INFORMATION SYSTEM SKILLS FOR VOCATIONAL EDUCATION IN CALIFORNIA COMMUNITY COLLEGES

At present, there is a decline in full-time college enrollments, an increase in private vocational school enrollments, legislative insistance on educational accountability, publicized discrepancies between how students are prepared and the skill requirements imposed by local industry, and a resultant reluctance upon the part of tax payers to continue their financial support of public education. Thus, educational leaders at all government levels are attempting to upgrade Occupational Education management in terms of skills, knowledge, and attitudes.

To meet this task, Chancellor Sidney W. Brossman paved the way for fifteen California Community Colleges to participate in a program designed to develop and demonstrate a training and internship model that would provide skilled, experienced project managers -- especially at the levels of dean and assistant dean -- for Occupational Education in California Community Colleges.

State and federal funding agencies agreed that project managers should be skilled in the formulation and use of logical problem-solving techniques that have built-in assurance of objectivity and validity. Under the direction of Dr. Otto A. Heinkel, San Diego Community College District, research was conducted to produce a management system and procedures training model with resource materials for serving as an operational guide for a continuing program to develop professional management skills in Occupational Education leaders. For the initial year of the study, eighteen Occupational Education leaders from districts throughout the state received training in producing comprehensive system plans for accomplishing practical projects compatible with state and local priority needs. Instruction was provided by a panel of university management specialists and independent consultants, and emphasized product development rather than theoretical training. The consulting team focused upon system approach concepts of product development with participants skill development as a spin-off. A continuous and objective assessment of participant feedback reflected the program's initial success. Through reliable data collection, it was found that project participants rated the consultant team highly, even more favorably at the project's conclusion. While there was some delay in the time line schedule, management functions were accomplished as intended, and the project met its objective of producing fifteen skilled Occupational Education leaders. In a confidential assessment, project consultants and evaluators rated participants' projects as generally superior. It was the opinion of external and internal evaluators that the project described met all the main, original objectives in addition to providing means for assisting others interested in replicating the program.

ED 081419

DEVELOPMENT OF MANAGEMENT AND INFORMATION SYSTEM SKILLS FOR VOCATIONAL EDUCATION IN CALIFORNIA COMMUNITY COLLEGES

Final Project Report

Submitted by:

Otto A. Heinkel, Ph.D.
Director of Research
San Diego Community Colleges
835 Twelfth Avenue
San Diego, California 92101

1972

CONSULTANT TEAM: Otto A. Heinkel, Project Director

Roger A. Kaufman
Edward Snyder
R. Ronald Wood

Additional presentations made by Robert Kane and Edward Welling.

Resumes of consultants may be obtained by writing Dr. Otto A. Heinkel, Director of Research, San Diego Community Colleges, 835 Twelfth Avenue, San Diego, California 92101

EVALUATION: J C Fikes
Marie E. Plakos

STAFF: Peggy E. Bolton
Cheryl L. Daniel
Dean G. Klampe
Elizabeth S. Thunell

This research was conducted by the San Diego Community College District during the 1971-72 year in cooperation with the California Community Colleges Chancellor's Office, Occupational Education Section and performed under Title I, Part C, Sec. 131 (b) of Public Law 90-576 and the CRCU Small Grant Program.

TABLE OF CONTENTS

	Page
Introduction	1
Design of the Skills Development Program	2
Evaluation Summary and Conclusions	6
Internal Evaluation Report of the Revised Project Objectives	11
Training Model Developed by the Project Consultants	13
Appendicies	
A. Mission Profiles	A1
B. Needs Assessment Tools	B1
C. Workshop Materials	C1

INTRODUCTION

Vocational education in California has undergone dramatic changes within the past decade. Many interrelated factors have contributed to this condition. Included are changing societal values, business and industry requirements (with corresponding educational implications), the demand for educational accountability, and the introduction of formal needs assessment systems into vocational education.

As a result, educational leaders at local, state and federal levels now recognize the necessity to upgrade vocational education management knowledge, attitudes and skills to meet the new demands. On September 1, 1972, Chancellor Sidney W. Brossman announced that personnel from 15 community colleges would be selected to take part in a program to develop and field test a model for educating vocational education leaders in management systems and procedures.

As the program unfolded, formative evaluation (on-going, rather than terminal evaluation) resulted in revisions of (1) the original objectives, (2) program processes, and (3) program content. The changes were made to meet the expectations and needs of both the participants and the consulting team.

In the opinion of external and internal evaluators the project met all of the main, original objectives. In addition, an attempt was made to assist others who are interested in replicating the program.

DESIGN OF THE SKILLS DEVELOPMENT PROGRAM

Description of the Originally Funded Proposal

There is a critical demand for vocational education leaders to be system-oriented, especially at the levels of Dean and Assistant Dean. The California Community Colleges Chancellor's Office has urged immediate attention to the above problem. State and federal funding agencies are acutely aware of the problem through their reviews of project applications. To be effective and efficient, project managers should be skilled in system design and analysis, function analysis, needs assessment, formative and summative evaluation, educational accomplishment audits, financial reporting and audits, and dissemination strategies. They should understand innovations such as program planning budgeting and evaluation systems (PPBES), fault-tree analysis, and WICHE taxonomy.

This project was designed to develop and demonstrate a training and internship model that will provide skilled, experienced project managers for vocational education in California Community Colleges. The model emphasis is on a six-step problem-solving process for a system approach to education (Kaufman, Roger. Educational System Planning. New York: Prentice-Hall, Inc. 1972). Basically, the six steps involve identification of a problem based on needs, determination of solution requirements and alternatives, solution strategy selection, implementation of selected strategies, performance effectiveness determinations and revisions as required.

Conditions of the Project Grant

Fifteen vocational education leaders from districts throughout the state will receive training in the first year. Participants will produce comprehensive system plans for

accomplishing practical projects that are compatible with state and local priority needs. A panel of university management specialists will be used for quality control of the operating internship model. Independent consultants will be retained to provide evaluation and auditing services. The internship system, including materials, will be documented and packaged for export to other areas. Program graduates and project staff will provide resource personnel dispersed throughout the state.

Use to be Made of Findings

The management systems and procedures training model with resource materials will be used as an operational guide for a continuing program to develop professional management skills in vocational education leaders. It will serve as an exportable model to encourage similar management development efforts in other states. The plans that are developed for priority projects during the pilot internship will serve as points of departure for proposals to state, federal and private funding agencies.

Program Direction

A difference of opinion concerning objectives and procedures to be used during the instruction sessions arose among the consultants during the planning sessions. Some felt that primary emphasis should be on training. Others felt that the primary emphasis should be the production of the required products to which the project was committed. A decision was made to devote the first session to a training mode using Kaufman's A System Approach to Education, and to revise the emphasis according to the participants' needs.

From this session the consultants received immediate feedback from participants, and, although formal evaluations were positive, the verbal feedback indicated more interest in product development than in training. As a result, the

remainder of the project emphasized system approach concepts of product development with participant skill development as a spin-off.

Having resolved the issue of emphasis on product rather than on training, the consulting team focused upon the consistency of the original project objectives with the agreed-upon redirection. The shift in emphasis was compatible with the original project objectives which were as follows:

1. Following completion of the eight, two-day sessions, at least 15 participants will have completed the training and internship program.
2. Within 30 days of completion of the sessions, 10 or more products will be produced by the participants working with consulting team members. When developed, the products will be accepted by participants involved and by the consulting team, and by external evaluators. Acceptance will be indicated through written or verbal response. Developed products will include:
   A. Mission Objective.
   B. Five or more Performance Requirements for the Mission Objective.
   C. Mission Profile.
3. Within 90 days of completion of the sessions, the consulting team will develop an instructional model reflecting the objectives and procedures of this project. The model will be accepted by the funding agency, to be indicated by acceptance of the final report of the project, including the model.

Instructional Approaches

The program sessions utilized a variety of instructional approaches. Basically three strategies were used. (1) Large group sessions, (2) Small group instruction and (3) Individual instruction. Large group instruction was used at the beginning of each session to discuss objectives, to give

media presentations, to present lectures, and to obtain feedback from daily activities. Each session provided verbal feedback for revision as needed for subsequent sessions. Small group instruction was used to increase participant skill levels with instructional materials. During the third session consultants were assigned to individual participants. Small group sessions also were used in product development, with participants having similar products grouped together. Three to five participants were assigned to each consultant. Individual instruction was used primarily in the development of product. Each consultant sat individually with assigned participants and worked "elbow-to-elbow" on their products. Through this instructional mode, specific questions from each participant were discussed and ambiguities clarified.

Although each participant was assigned to an individual consultant, considerable cross-fertilization occurred between participants and consultants assigned to other groups. Frequently, a participant worked individually with two or three consultants to secure different points of view on his product. For each participant, however, an individual consultant maintained the primary responsibility to insure product delivery according to specification. Formative, or enroute evaluations, were conducted throughout the project to determine the relevance of workshop strategies to participant expectations and the project objectives. These evaluations were conducted informally through verbal feedback and formally with a rating scale.

Formal evaluation charts and detailed descriptions of procedures of the project as it progressed may be obtained by writing the Office of the Project Director. See Appendix C for a bibliography of working materials.

EVALUATION SUMMARY AND CONCLUSIONS

The management training course for leaders in vocational education in California community colleges completed its pilot year which included eight two-day sessions. During this period a team of consultants trained 18 vocational education leaders in project design and management and produced 12 comprehensive planning models of high state/local priority. A complete evaluation report by J C Fikes and Associates is available through the Office of the Project Director.

The following points are summarized from the data presented in the body of the full report.

- The project successfully met its objective of producing 15 trained vocational education leaders. The actual number completing the requirements was 18.
- The project successfully met its objective of producing 10 comprehensive system plans. The actual number of plans submitted and approved was 12.
- Project participants rated the content of the training program high and gave an overall rating at the end of the project which was significantly higher than at the beginning of the project.
- Project participants reacted favorably to the methods applied to presenting the content and showed a positive gain in their rating from the pre to post period.
- Project participants rated the consultant team high and gave them an even higher rating at the conclusion of the project than was given in the beginning sessions.

- Project consultants and evaluator rated the products of the participants in the high-superior range.
- Management functions were carried out as planned with some delay in the time line schedule.
- Written comments by the project participants were highly supportive of the value of the project to the participants personally and to their college.

The following figures 1 and 2 are samples of the forms used in collecting evaluation data.

Figure 3 is a sample of how participant evaluation was presented during the sessions.

It should be emphasized that the contents and recommendations in this report are based upon the detailed data collected and analyzed such as presented in Figure 3 using instruments such as those shown in Figures 1 and 2. The reader is spared the details of the raw and reduced data which are available from the project director.

FIGURE 1

PROGRAM IMPROVEMENT GUIDE

NAME _____ No. _____

SCHOOL _____

Would you please mark one of the seven spaces provided for each set of words by placing an X in the box that most closely reflects your attitude toward the area indicated.

The questions are designed to guide us to develop an ongoing service program that will be of direct help to all of us in the field. This is our chance to guarantee a practical service aimed at helping us with our everyday operations in the local school districts.

CONTENT

The concepts and information presented in this session were:

Useful:	____	____	____	____	____	____	____	:Unuseful
Difficult:	____	____	____	____	____	____	____	:Easy
Good:	____	____	____	____	____	____	____	:Bad
Organized:	____	____	____	____	____	____	____	:Unorganized
Confused:	____	____	____	____	____	____	____	:Clear
Interesting:	____	____	____	____	____	____	____	:Uninteresting

METHOD

The method of presenting the information was:

Liked:	____	____	____	____	____	____	____	:Disliked
Inefficient:	____	____	____	____	____	____	____	:Efficient
Good:	____	____	____	____	____	____	____	:Bad
Unorganized:	____	____	____	____	____	____	____	:Organized
Interesting:	____	____	____	____	____	____	____	:Uninteresting

CONSULTANTS

The consultant(s) involved in this session were:

Efficient:	____	____	____	____	____	____	____	:Inefficient
Bad:	____	____	____	____	____	____	____	:Good
Friendly:	____	____	____	____	____	____	____	:Unfriendly
Disliked:	____	____	____	____	____	____	____	:Liked
Organized:	____	____	____	____	____	____	____	:Disorganized
Personal:	____	____	____	____	____	____	____	:Impersonal

- - - -

FIGURE 2

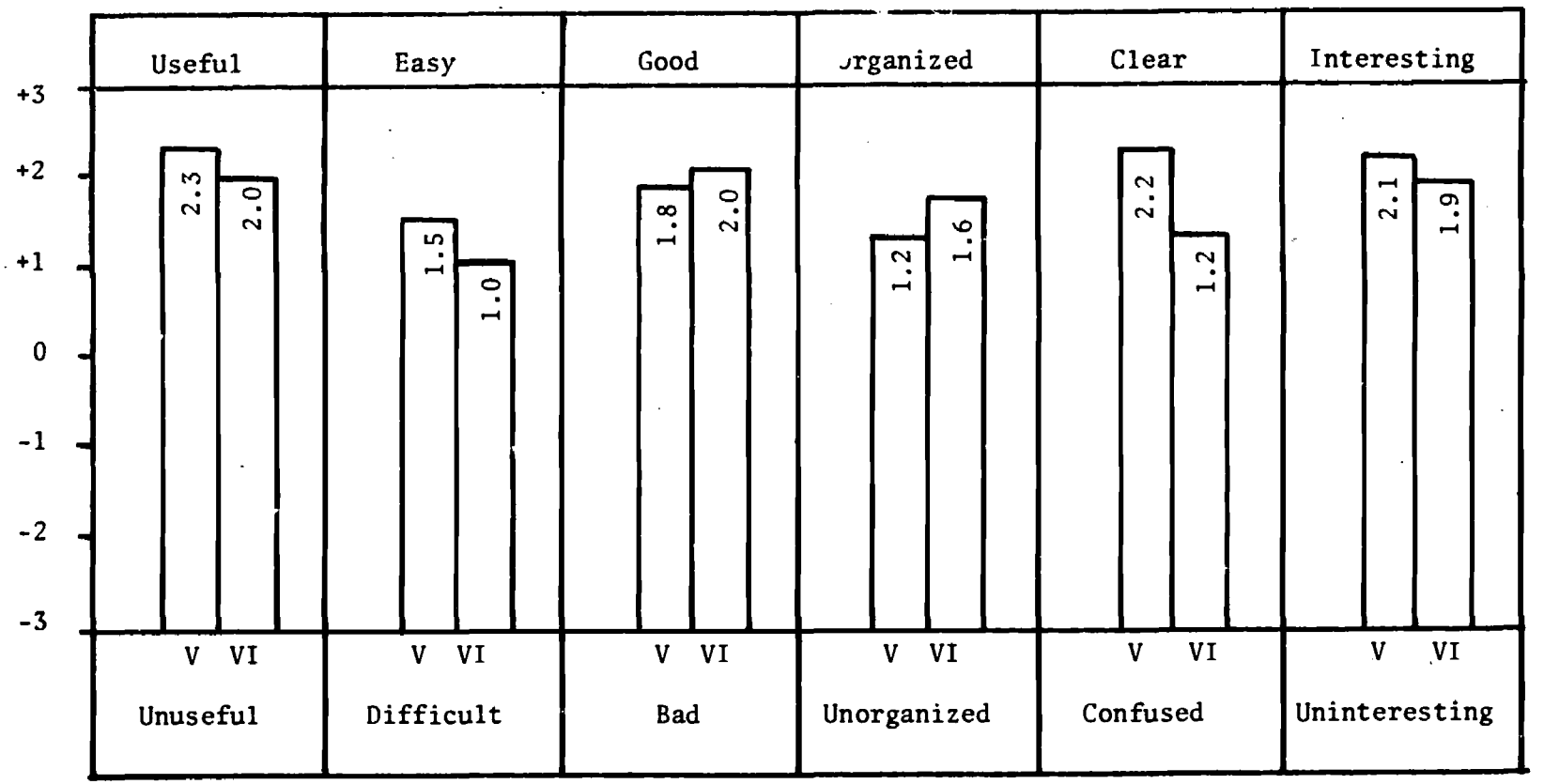
PRODUCT

How do you perceive the likelihood of your being able to meet the objective you brought to this project (within the eight two-day sessions provided for this purpose).

Confident:____:____:____:____:____:____:____:Unconfident
Unlikely:____:____:____:____:____:____:____:Likely
High:____:____:____:____:____:____:____:Low

FIGURE 3

PARTICIPANTS EVALUATION OF CONTENT PRESENTED IN TRAINING SESSIONS V, VI



INTERNAL EVALUATION REPORT
OF THE
REVISED PROJECT OBJECTIVES

As a supplement to the external evaluation report submitted by J C Fikes and Associates, the project staff presents this internal evaluation.

Objective #1

Following completion of the eight two-day sessions, at least 15 participants will have completed the training and internship program.

Eighteen participants completed the program. Thus, this objective as stated was met.

Objective #2

Within 30 days of completion of the sessions, 10 or more products will be produced by the participants working with consulting team members. The products, when developed, will be accepted by the participants, the consulting team, and the external evaluators. Acceptance will be indicated through verbal or written response. The developed products will include:

A. A Mission Objective
B. Five or more Performance Requirements for the Mission Objective
C. A Mission Profile

This objective was met. Within 30 days of completion of the project, twelve (rather than 10) products were completed (see Appendix A), each of which contains a Mission Objective, five or more Performance Requirements, and a Mission Profile. Verbal and/or written acceptance has been received from the required persons, while the criteria for acceptance are met by each developed product. Several

consultants feel, however, that too much consultant revision of the trainees products was required--perhaps this is a reflection of the basic orientation of the project--product production over participant training.

Objective #3

Within 90 days of completion of the sessions, the consulting team will develop an instructional model which reflects the objectives and procedures of this project. The model will be accepted by the funding agency, to be indicated by acceptance of the final report of the project, including the model.

If this final report and training model is accepted by the funding agency, then this objective will be met. The model shown in this report includes a Mission Statement, five or more Performance Requirements and a Mission Profile, as required.

TRAINING MODEL DEVELOPED BY THE PROJECT CONSULTANTS

The following training model was developed by the consulting staff following completion of the eight training sessions. The model is not intended as a "cookbook" or "how to". It focuses on outcomes together with a process whereby the reader can follow identified steps and develop a similar training program to meet his or her local training requirements, given the commitment of necessary financial, personnel, time and support resources.

The Training Model includes:

1. A Mission Statement for the Training Model
2. Performance Requirements for the Mission Statement
3. A Mission Profile showing the major functions to be accomplished (in function flow-block diagram format)
4. A narrative description of the Mission Profile
5. A set of sample materials used during the training sessions (See Appendix C)

The consulting staff believes that with the above, a system-oriented vocational educator should be able to replicate this training model in another setting to meet local requirements.

Mission Statement

The internship will produce in participants a conscious awareness of system concepts applied to management planning and the utility of the system approach in effectively achieving project objectives. Upon completion of the internship, participants will have developed a product which, if implemented, reduces or eliminates (a) measured discrepancy(ies) between (a) required outcome(s) and (a) current outcome(s) at their local education agency according to specification. All developed products will minimally include a Mission Analysis.

Performance Requirements

1. When given a function flow-block diagram with blank spaces, at least 80% of the trainees will correctly identify with 100% accuracy, the six steps in Kaufman's model for Educational System Planning.
2. Following the presentations during the appropriate training sessions, at least 80% of the trainees will correctly identify on a worksheet with 100% accuracy proper definitions for the following terms:
    2.1 Need
    2.2 Needs Assessment
3. Following appropriate training sessions, at least 80% of the trainees will correctly identify on a worksheet with 100% accuracy the proper definitions for the following terms:
    3.1 Mission Objective
    3.2 Performance Requirements
    3.3 Mission Profile
4. Following the appropriate training sessions, at least 80% of the trainees, when given a worksheet with correctly and incorrectly stated measurable objectives, will identify with at least 80% accuracy the correctly stated measurable objectives.
5. The final product developed by each trainee will contain an evaluation sub-system. The evaluation sub-system will provide for both Summative and Formative evaluation and will meet all of the criteria presented during the workshop as judged by the project director.
6. The final product developed by each trainee will contain a management sub-system including a Mission Analysis and Gantt Chart which conform to the criteria presented by the project staff.

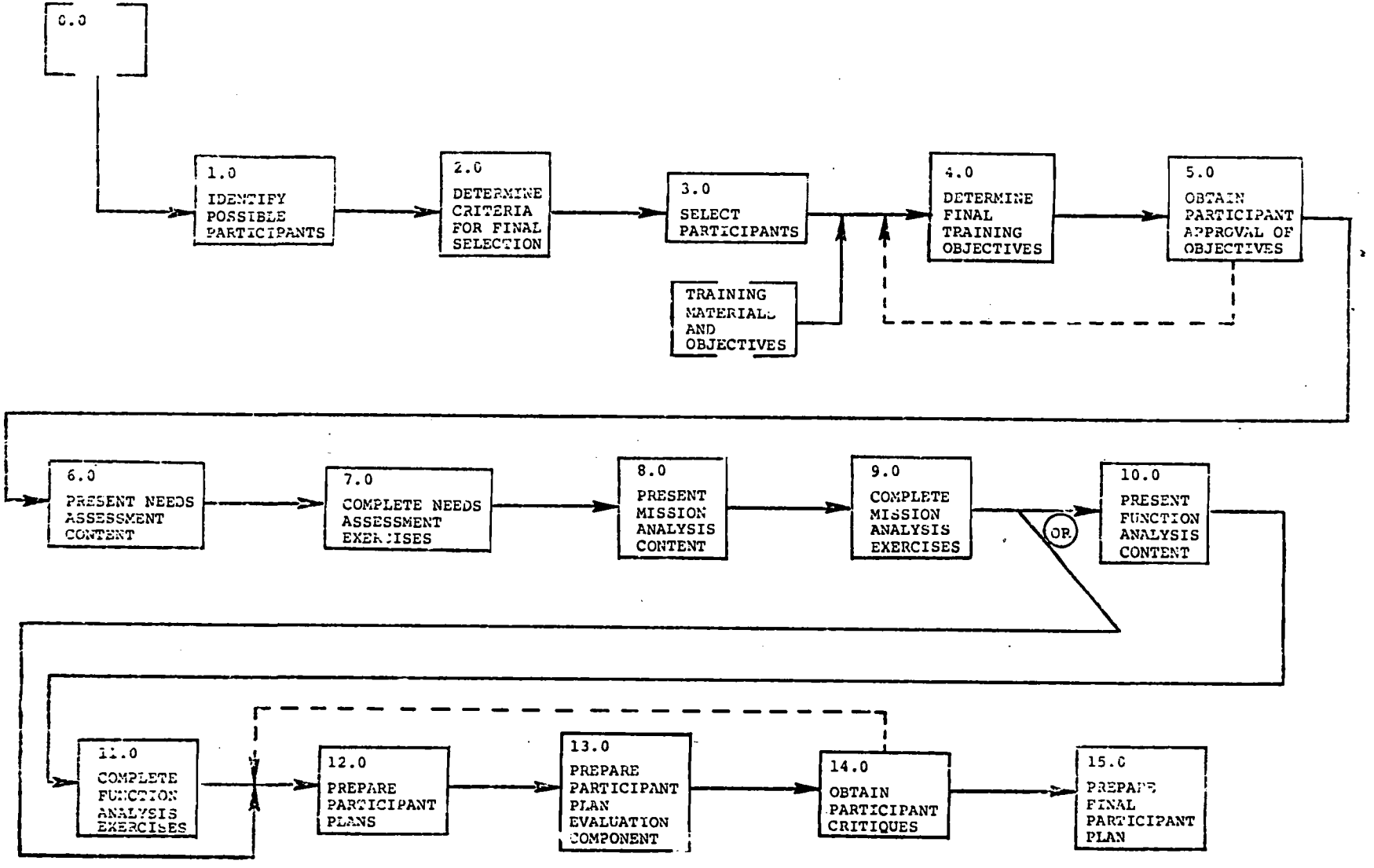
7. The final product developed by each trainee will be accepted by the trainee, the external evaluator or auditor, and one or more of the training consultants. Acceptance will be indicated through a written memo. The product will meet all of the criteria presented during the training session.

The following Mission Profile presents a system plan for conducting training with a group similar to the one originally trained in the management project. It differs from the model used in the project in that it begins with assumptions relative to the requirements for training, and presents a more pragmatic approach based upon the experiences derived in conducting the Management Training program.

There are fifteen functions suggested, with the more important revision (or feedback) pathways shown by dotted lines.

Also included is a table which shows a possible check list for training to be used by Community College personnel interested in conducting a training program plus a related listing of training materials which could be used for appropriate training items.

SUGGESTED MANAGEMENT TRAINING PLAN



ACTIVITIES CHECKLIST FOR SUGGESTED MANAGEMENT TRAINING PLAN

CHECKLIST	MATERIALS
1.0 Identify Possible Participants A. List those who require management skills in management plan B. Get suggestions from all Deans, appropriate Vic. Presidents, and Administrators C. Make up list of possible participants	
2.0 Determine Criteria for Final Selection A. Get Administrator's requirements B. Determine dollars available C. Determine possible personal resistances to new techniques D. Determine areas of college requiring most change. List in priority order	
3.0 Select Participants A. List possible participants in priority order B. Select participants on the basis of priority order until dollars available are exhausted C. Obtain Administrator's approval D. Set time and schedule for training E. Order materials F. Obtain facilities G. Obtain all other resources (Personnel, etc.) H. Notify participants (send materials to acquaint them with project, schedule, work to be done, overview of models to be used in training) I. Obtain participants commitment to training J. Inform Administration of final participants and commitment	"A Possible Integrative Model for the Systematic and Measurable Improvement of Education." (See Appendix C, Workshop Materials Item No. 7)

CHECKLIST	MATERIALS
4.0 Determine Final Training Objectives (using training materials and objectives) A. List objectives from training materials C. Note additional requirements and/or note objectives to be deleted D. List training objectives E. Inform Administration	Educational System Planning, Exercises at end of Chapters (See Appendix C, Workshop Materials item No. 6) Mission Statement and Performance Requirements for Management Project
5.0 Obtain Participant Approval of Objectives A. Order amenities for meetings (coffee, etc.) B. Present objectives C. Take "Flak" (Realize that each person will understand differently and help them to understand the purposes of training and development of their training and their potential "payoffs.") D. Obtain their approval (you might have to go back through 4.0 to make a final resolution) E. Make list of objectives for each participant F. Inform Administration	
6.0 Present Needs Assessment Component A. Present slide portion of "System Approach" B. Break into small groups and formulate questions C. Reconvene and answer questions D. Read chapter on Needs Assessment E. Answer questions F. Break into two groupings: a. review with consultants, b. working on own problem	"A System Approach to Educational System Planning" (Slide-tape presentation). (See Appendix C, Workshop Materials item No. 4) ESP, Chapter 3 (See Appendix C, Workshop Materials item No. 9)

CHECKLIST	MATERIALS
7.0 Complete Needs Assessment Exercises A. Answer questions at the end of chapter of "ESP" B. Obtain group concurence on answers C. Perform a simple Needs Assessment on Project for each participant or group of participants organized into an "affinity" group D. Obtain group critique of each Needs Assessment developed by each individual/group E. Prepare Needs Assessment draft for each individual/group	ESP, Exercises for Chapter 3 (See Appendix C, Workshop Materials item No. 6)
8.0 Present Mission Analysis Content A. Present slide material on Mission Analysis B. Repeat steps for 6.0	"A System Approach to Educational System Planning" (Slide-tape presentation). (See Appendix C, Workshop Materials item No. 9) ESP, Chapter 4 (See Appendix C, Workshop Materials item No. 6)
9.0 Complete Mission Analysis Content A. Repeat same steps for 7.0	ESP, Exercises for Chapter 4 (See Appendix C, Workshop Materials item No. 6)
10.0 Present Function Analysis Content A. Present slides on Function Analysis only B. Repeat steps for 6.0	"A System Approach to Educational System Planning" (Slide-tape presentation). (See Appendix C, Workshop Materials item No. 9) Educational System Planning, Chapter 5 (See Appendix C, Workshop Materials item No. 6)
11.0 Complete Function Analysis Exercises A. Repeat steps for 7.0	Educational System Planning, Exercises for Chapter 5 (See Appendix C, Workshop Materials item No. 6)

CHECKLIST	MATERIALS
12.0 Prepare Participant Plans A. Summarize material from 7.0, 9.0 and (if appropriate) 11.0 B. Determine the usefulness of this for each individual's responsibilities and role C. With the participant, development of the Needs Assessment, Mission Objective, Performance Requirements, Mission Profile and necessary function analysis materials D. Check for internal and external consistency (internal: do all functions agree with all other functions in the plan; external: is consistent with the "real world" of the participant)	Criteria and format from Educational System Planning (See Appendix C, Workshop Materials item No. 6)
13.0 Prepare Participant Evaluation Component for Each Plan A. List objectives for Mission and Function Analysis Levels B. Derive measurable criteria for each objective or group of related objectives C. Determine possible evaluation instruments for each objective or group of related objectives D. Select evaluation instruments for each objective or group of related objectives. E. Identify objectives and instruments to be used in Formative evaluation procedures F. Identify objectives and instruments to be used in Summative evaluation procedures G. List all objectives, instruments, in order in which they will be used	

CHECKLIST	MATERIALS
14.0 Obtain Participant Critiques A. Duplicate all participant plans B. Distribute each plan to all participants C. Obtain change recommendations for each plan for each participant D. Compile all suggested changes for each component of each plan E. Present change suggestions to each participant for his plan	Sample participant-derived Models in Appendix A
15.0 Prepare Final Participant Plan A. Get revised plans from each participant B. Review for consistency, format, and applicability C. Negotiate suggested changes D. List final plans for each participant E. Inform Administration	Sample participant-derived Models in Appendix A

APPENDIX A

MISSION PROFILES

This section presents the documented products developed by the participants in the project titled, *Development of Management and Information System Skills for Vocational Education in California Community Colleges.* An objective of the project was to produce at least 10 products. At the project's completion the participants had developed the 12 mission profiles which are reproduced herein.

The mission profiles are categorized as preliminary and are designed to furnish a basis for writing detailed management plans that would be followed in conducting specific vocational education projects.

As a minimum, the participants developed a mission objective which was stated in measurable terms. Performance requirements were identified for the mission, and functional flow diagrams were produced to illustrate the various procedural steps, their relationships and inter-relationships, toward accomplishing the stated mission objectives.

Following is a list of the profiles:

Title	Page
Francis J. Clines, Coordinator of Vocational Education, Los Angeles Harbor College: *Development of a System of Procedures for Distributing Part B. VEA Funds*	A 3
Charles E. Davis, Coordinator of Research and Development, Los Angeles Trade-Tech College: *Development of Procedures for Data Management Relative to Administrative Decision Making*	A 22
Fred E. Ittner, Chairman, Business Division, College of Alameda: *Cost/Benefit Analysis Model for Vocational Educational Programs*	A 35

Title	Page
Louis G. Trapp, Area Coordinator, Vocational Education, Contra Costs Junior College District: *Model Development for a Master Plan to Implement Vocational-Technical Education Programs*	A 39
Arthur N. Cherdack, Coordinator of Institutional Research and Development, East Los Angeles College; Arthur S. D'Braunstein, Coordinator of Technical-Vocational Education, Chabot College; Joseph E. Berruezo, Assistant Dean of Instruction/Director of Vocational-Technical Education, Marin Community College District: *A Management Information System Plan for State-Required Vocational Education Reports*	A 45
Clinton R. Hamann, Coordinator of Vocational Education, San Diego Community Colleges: *Development of a Model to Identify and Assess Needs for Adult Skill Center Facilities*	A 55
Maxwell C. Gillette, Vocational Education Department, San Francisco Community College District: *A Model for Evaluating a Clerical Cluster of Classes Relative to Success in Job Placement*	A 62
Daniel R. Callahan, Supervisor of Instructional Services, San Francisco Community College District: *Development of a Plan to Produce Employment Success Among Vocational Students*	A 73
Roger D. Beam, Director of Occupational Education, Compton College; Vernon G. Spaulding, Supervisor of Occupational Education, Pasadena Area Junior College District: *Development of a Plan for Training Bio-Medical Equipment Technicians*	A 79
John Sharon, Coordinator of Vocational Planning, XII Vocational Planning Area, San Diego County: *Development of Area XII Master Plan for Vocational Education*	A 87
Richard E. Whiteman, Dean of Vocational Education, Cerritos College: *Development of Special Vocational Education Enablers for Physically Limited Students*	A 94
Cecil D. Green, Dean of Occupational Education, Riverside Junior College: *Development of Needs Assessment Procedures for Occupational Education at Riverside City College*	A 98

MISSION PROFILE

for

DEVELOPMENT OF A SYSTEM OF PROCEDURES

FOR DISTRIBUTING PART B, VEA FUNDS

by

Francis J. Clines

MISSION OBJECTIVE

By June 30, 1972, F. J. Clines, Coordinator of Vocational Education, Harbor College, will develop a system considered equitable (by criteria established by Harbor College Vocational Education Committee) to distribute Part B, VEA Funds allocated to the college within 30 days of official notice of the amount of funds from the Los Angeles Community College District office and to the signed satisfaction of 75% of the concerned staff members.

PERFORMANCE REQUIREMENTS

1. All instructors of vocational programs and other concerned staff members will be notified in writing of the availability of Part B, VEA Funds within one week of notice to the college of the amount of such funds.

2. Requests for expending Part B, VEA Funds will be submitted by the end of the Spring Semester on a standard form developed by the vocational staff members.

3. The Vocational Education Committee will make the division of funds allocated to the college in accordance with the approved system and within two weeks of receipt of allocation notice.

4. All decisions of the committee shall be based upon an assessment of needs enumerated by the staff members submitting requests for funds.

5. Challenges by non-recipients of grants for funds shall be resolved by the "committee for future action," with no more than one successful challenge each two funding periods.

IMPLEMENTATION REQUIREMENTS OF THE MISSION PROFILE

Needs Identification

- Discrepancy between "what is" and "what is required."
- Requires incorporating into model provisions for establishing baseline on present status of each group considered.
- Requires instrumentation (standardized and non-standardized) to obtain objective and subjective data.
- Requires records search to obtain supportive data.

Learner

In order to identify learner needs, current learner performance must be documented and compared to expected learner performance. It is important to note that the data generated for the comparison (match/mis-match) must be in the same format and must be generated using identical and/or parallel instruments.

With respect to the learner, consideration should be given to his skills, i.e., manipulative ability relative to course/program requirements; equipment operation/set-up/care/repair ability and requirements; and safety requirements for self and others relative to any physical or attitudinal deficiencies.

Learner attitudes should be referenced toward such factors as attitudes toward work, toward self, toward others, toward education and training, and toward instructors.

Learner knowledge to be considered should focus on technical, supportive, and manipulative cognitive requirements.

Vehicles whereby the above learner data may be obtained are: attitude scales; awareness scales; self-perception inventories; questionnaire on program and personal goals; checklist on program effectiveness; standard tests in academic areas (math and reading) and vocational areas; records on learner attendance, grades, full-time/part-time student, program length, tuition payee, classes offered/taken/completed/repeated, learner drop-out point/program change to a related/other program or exit from community college, instructor turnover, facilities/equipment utilized (in terms of operating condition and simulation to "real world"); and an instructor rating scale.

Subsequent to the match/mis-match of present learner status with anticipated learner performance requirements, the deficiencies/gaps or "needs" thus generated must be assigned some relative weight so that priorities may be established. It should be noted, however, that priority setting has at least two pre-requisites, (1) resource capability for successful implementation; this subsumes that community/learner/educator commitment has been obtained, and (2) criteria established and uniformly applied to each identified need. It may very well be, for example, that a high priority need, based upon pre-specified criteria, is not selected for "all out attack" simply because the requisite resources (human, material, physical) cannot be generated when desired timewise or in sufficient quantities. Constraining factors oftentimes associated with resource acquisition also serve as deterrents to smooth operation.

The final needs selected for resolution, then, are transformed into performance objectives, that is, objectives that are stated in specific knowing-and-doing terms. It must be remembered, however, that objectives vary (in terms of specificity) with regard to level and degree. The "level" refers to the entry point of the learner pursuant to his demonstrated skills/knowledges/attitudes. "Degree" refers to the delineation of objectives from gross statements of goals down to minute performance requirements. For learners, these minute performance requirements become behaviorally oriented -- the learner is told (1) what he must do, (2) under what conditions must he demonstrate his proficiency, (3) what materials/tools will he be given while he is performing the operation, and (4) by what criteria will he be assessed.

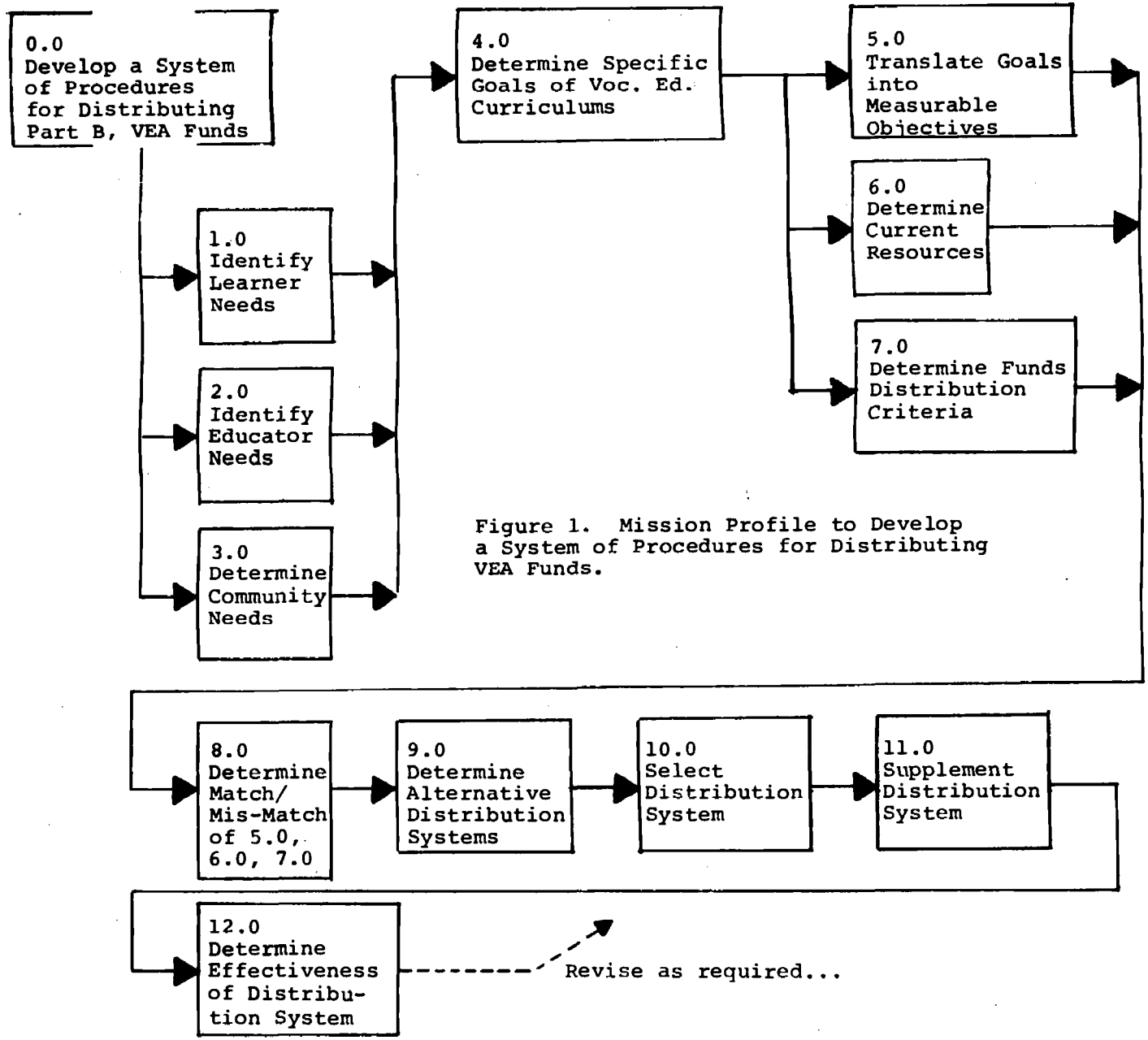
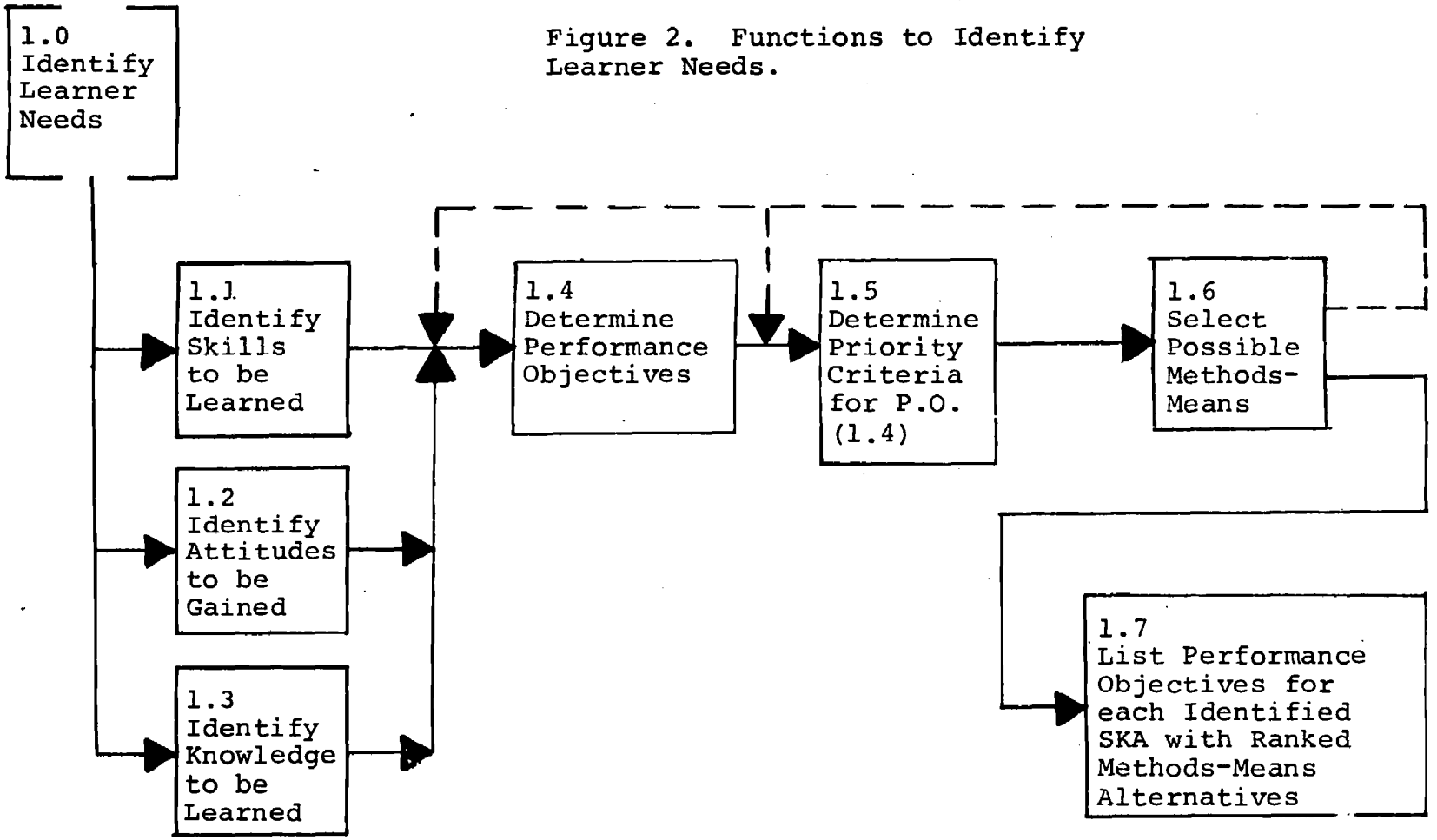


Figure 1. Mission Profile to Develop a System of Procedures for Distributing VEA Funds.

ERIC

Figure 2. Functions to Identify Learner Needs.



ERIC

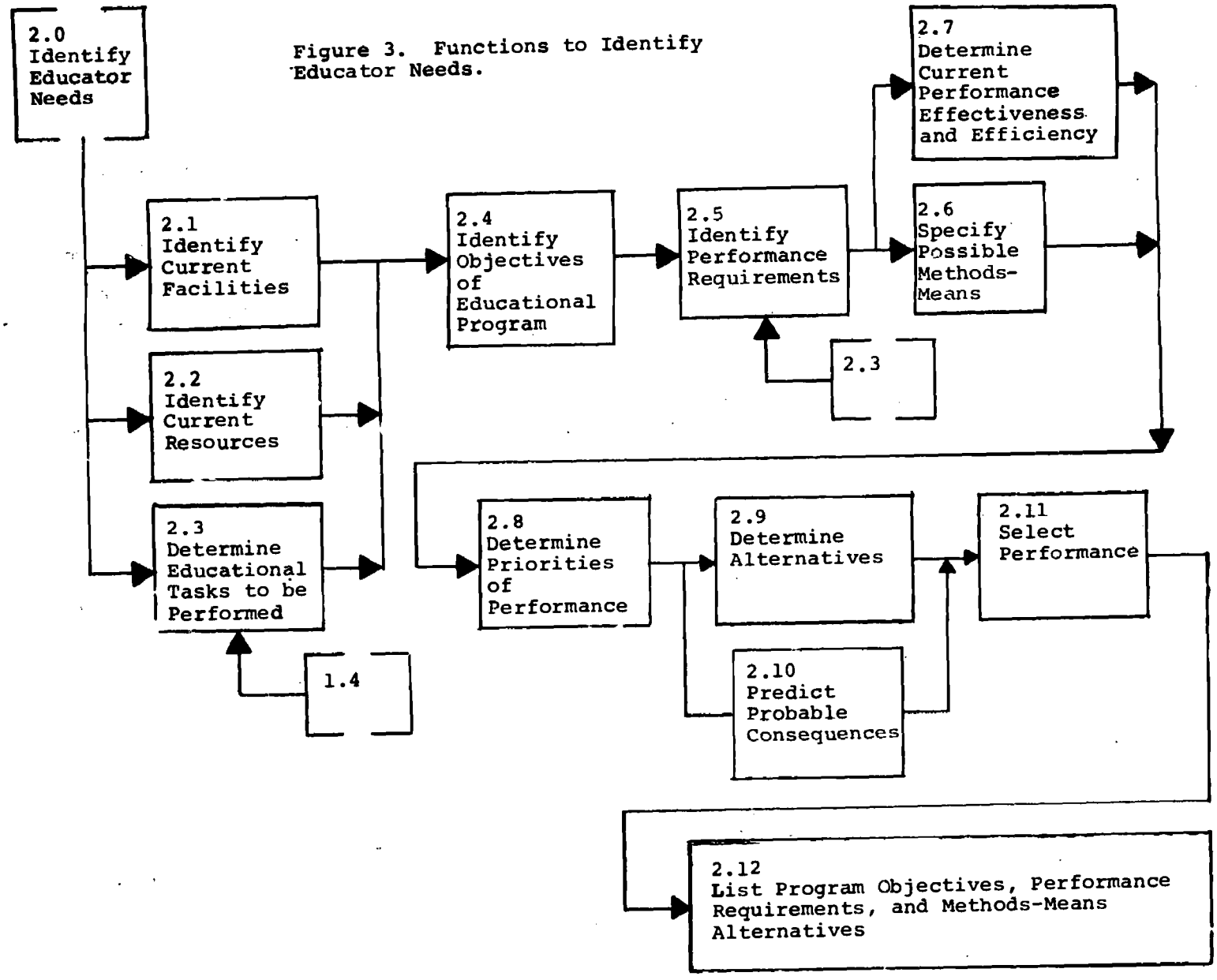


Figure 3. Functions to Identify Educator Needs.

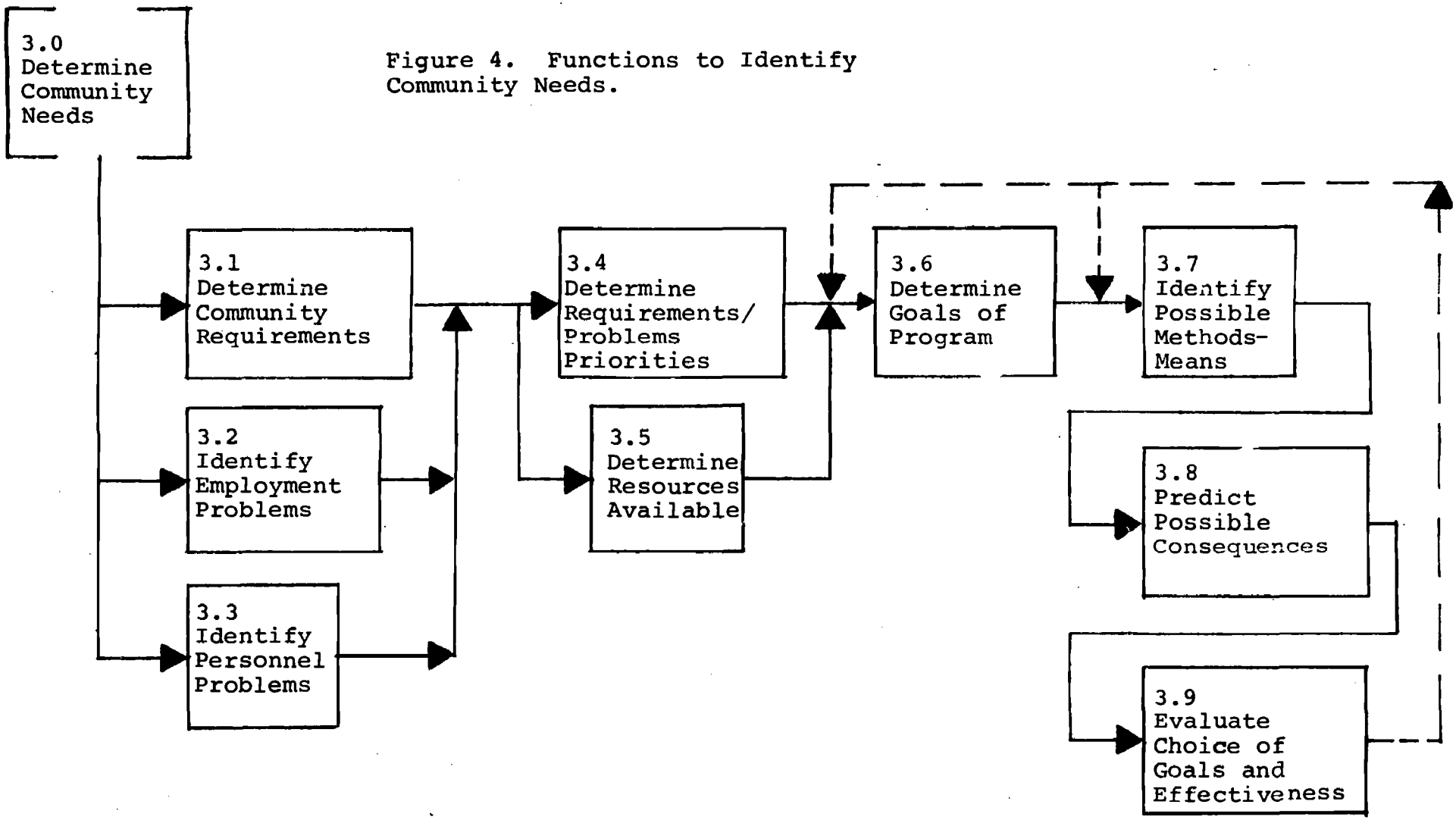


Figure 4. Functions to Identify Community Needs.

ERIC

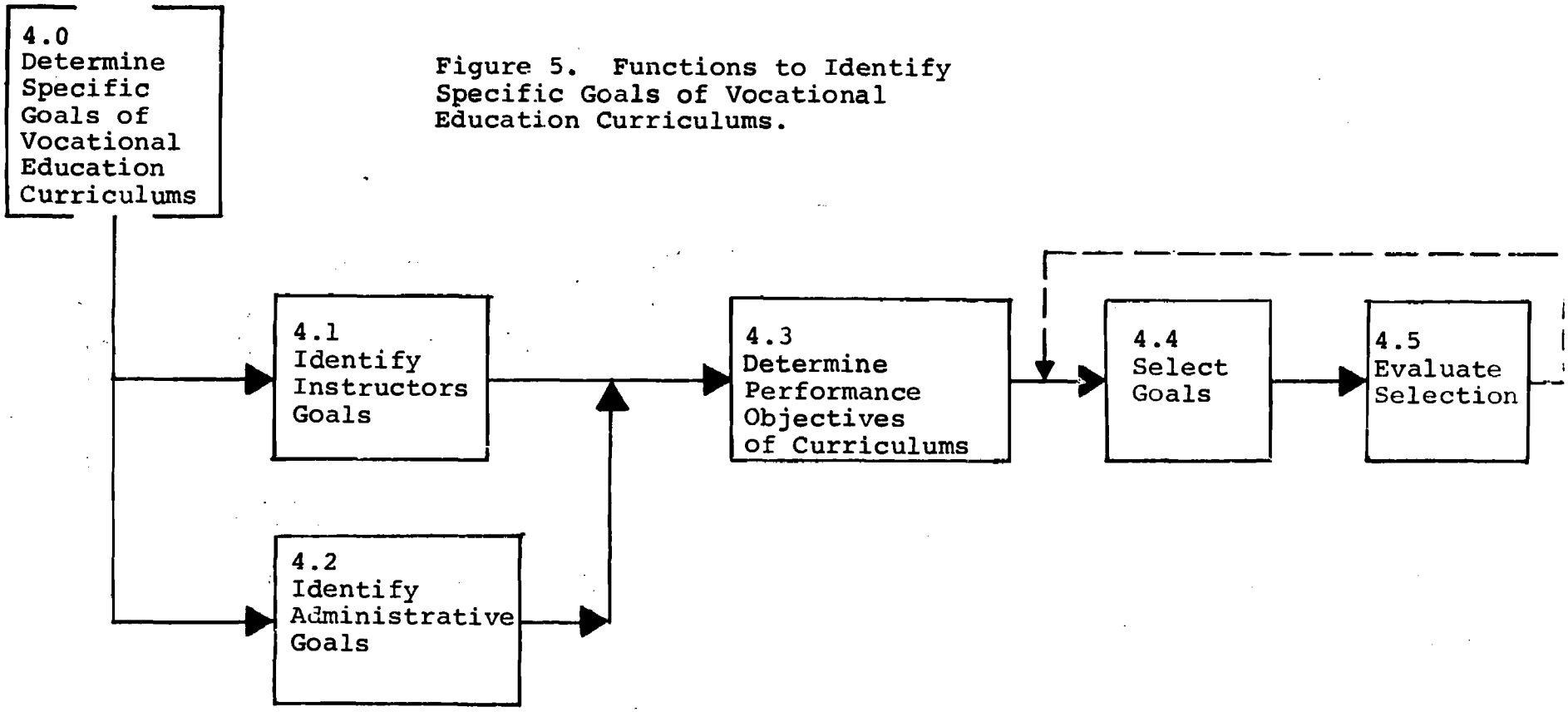


Figure 5. Functions to Identify Specific Goals of Vocational Education Curriculums.

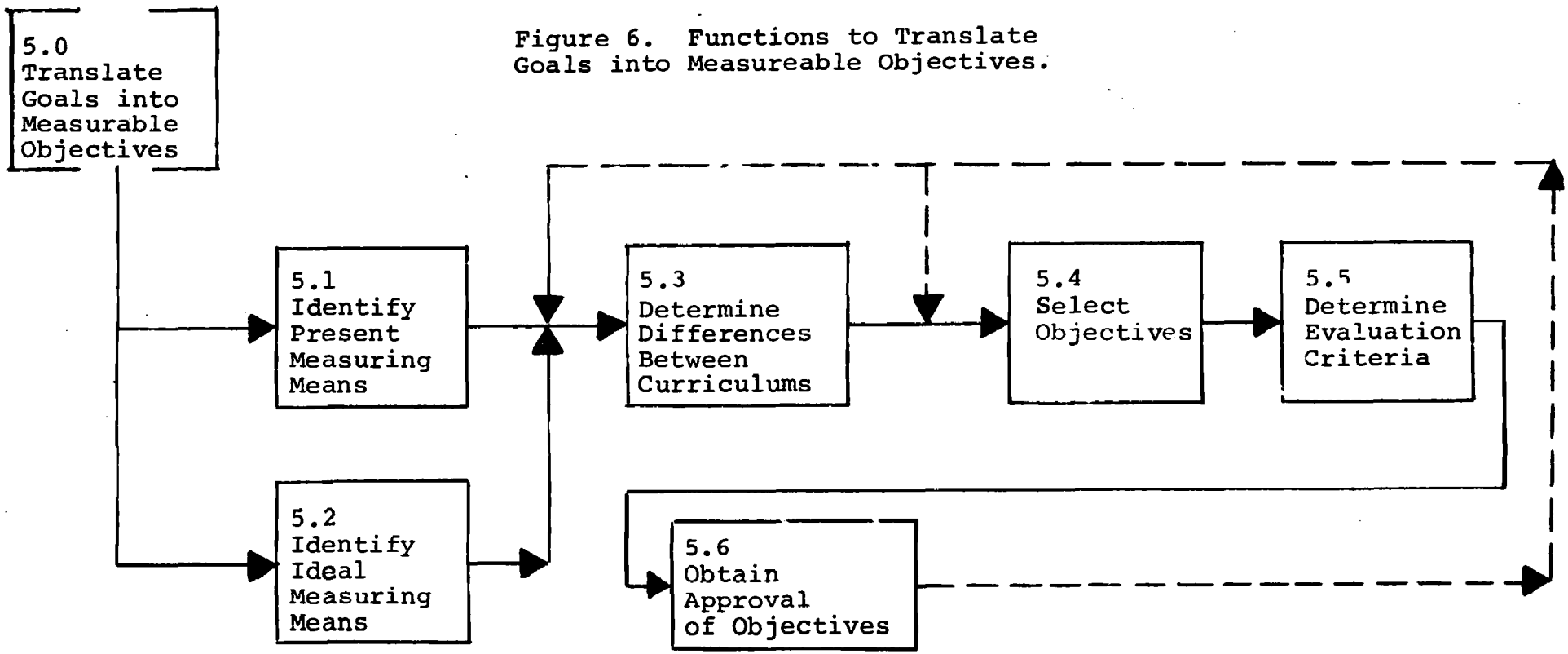


Figure 6. Functions to Translate Goals into Measureable Objectives.

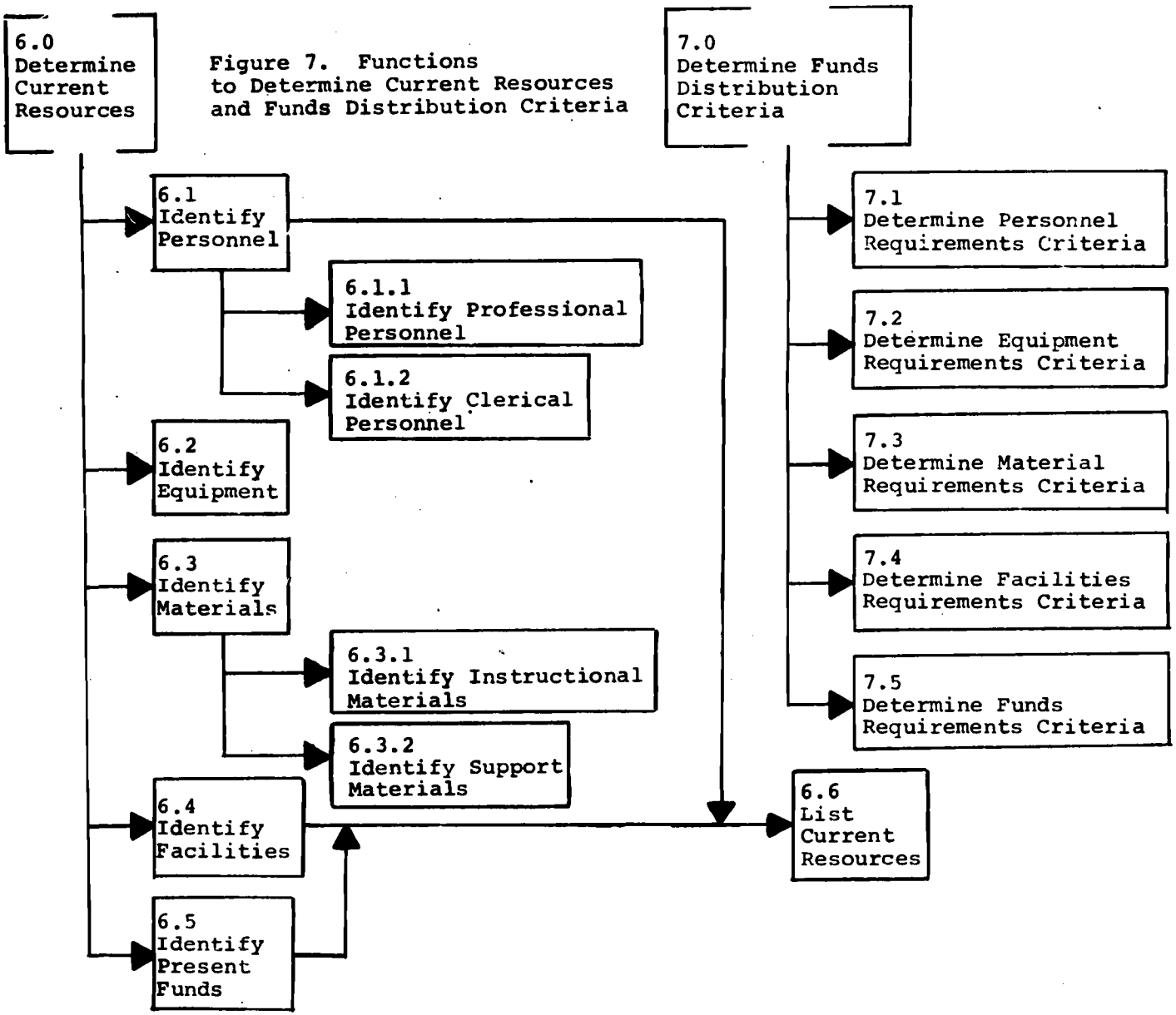


Figure 7. Functions to Determine Current Resources and Funds Distribution Criteria

ERIC

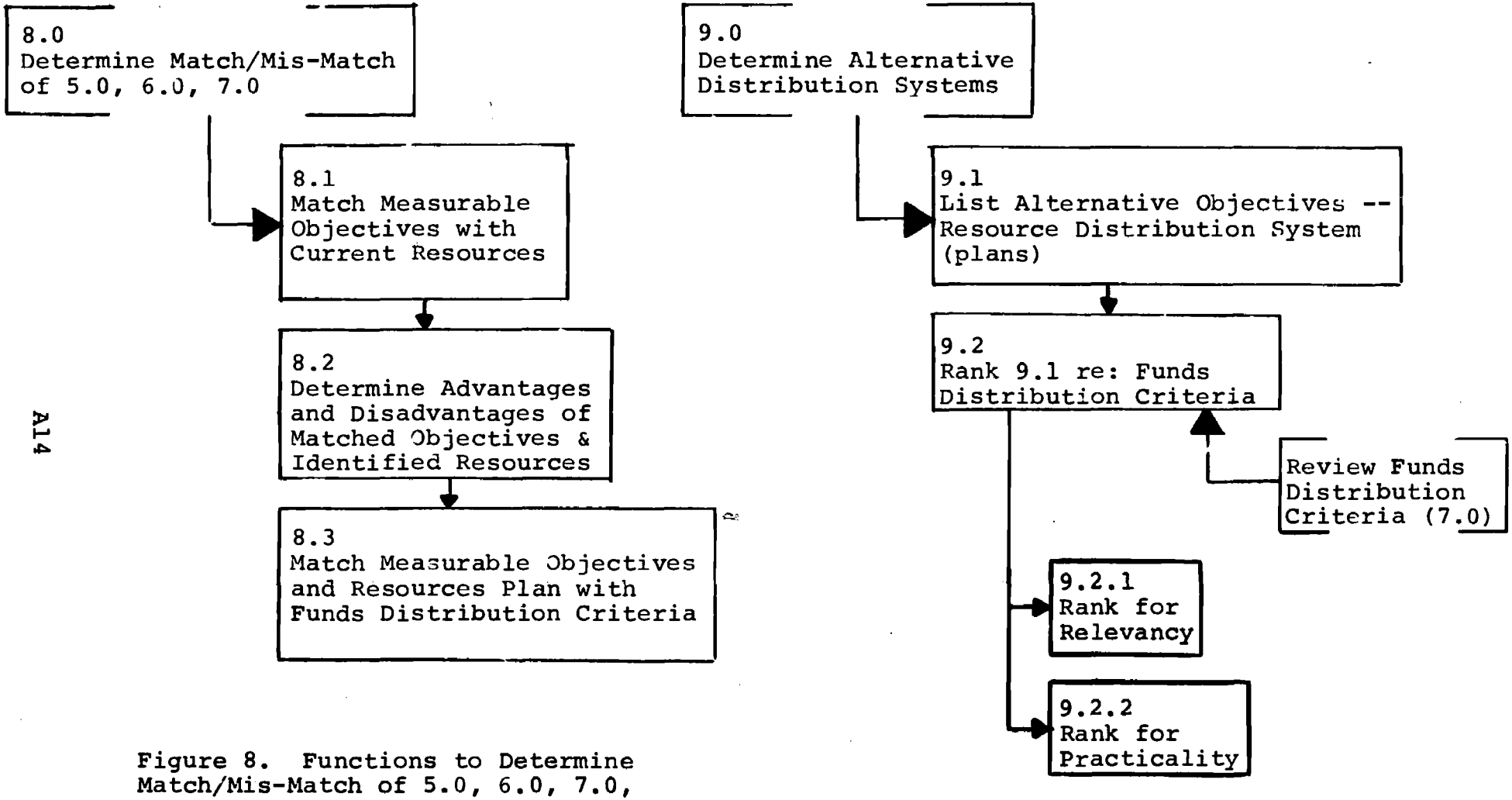


Figure 8. Functions to Determine Match/Mis-Match of 5.0, 6.0, 7.0, and Alternative Distribution Systems.

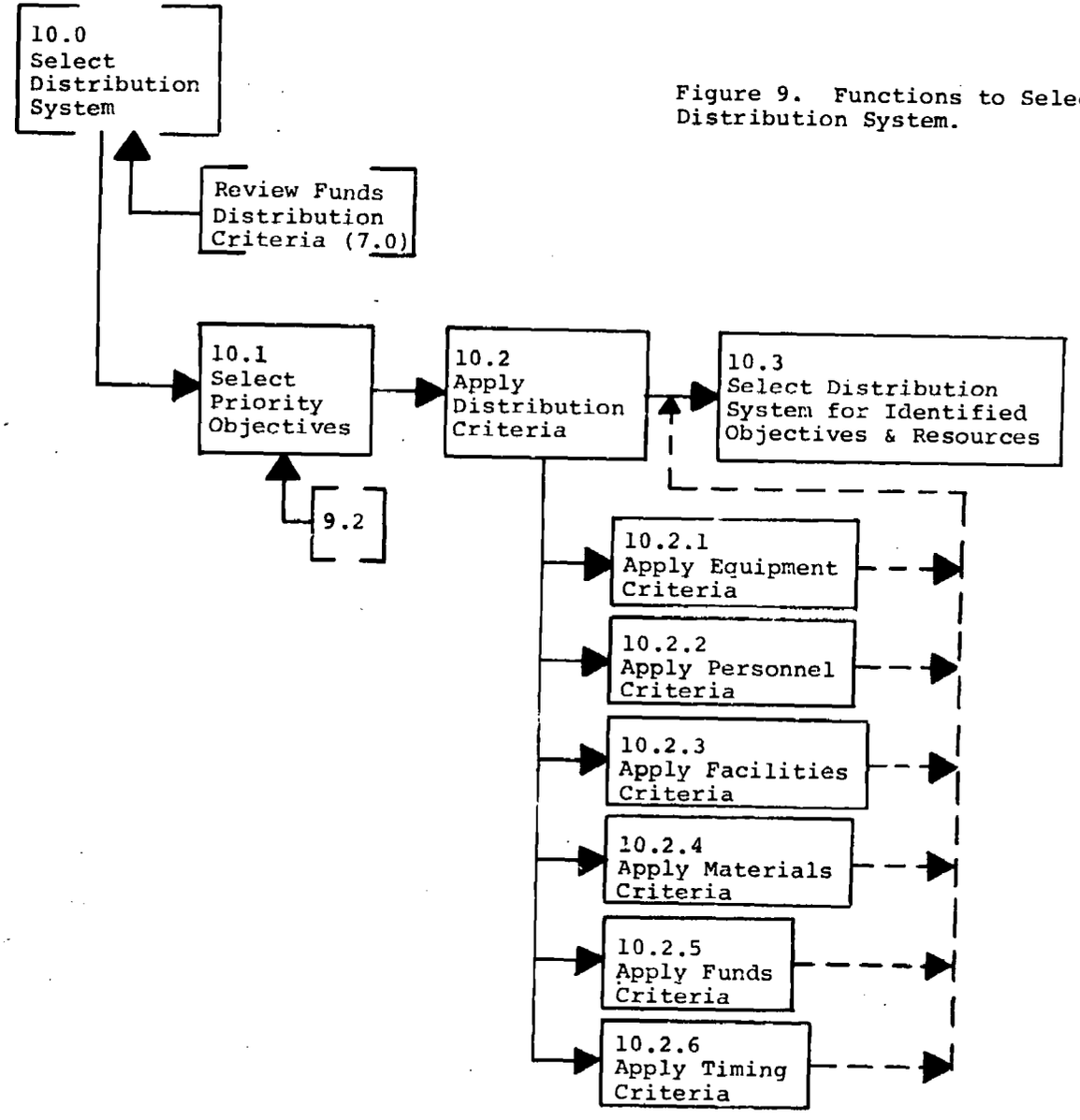


Figure 9. Functions to Select Distribution System.

ERIC

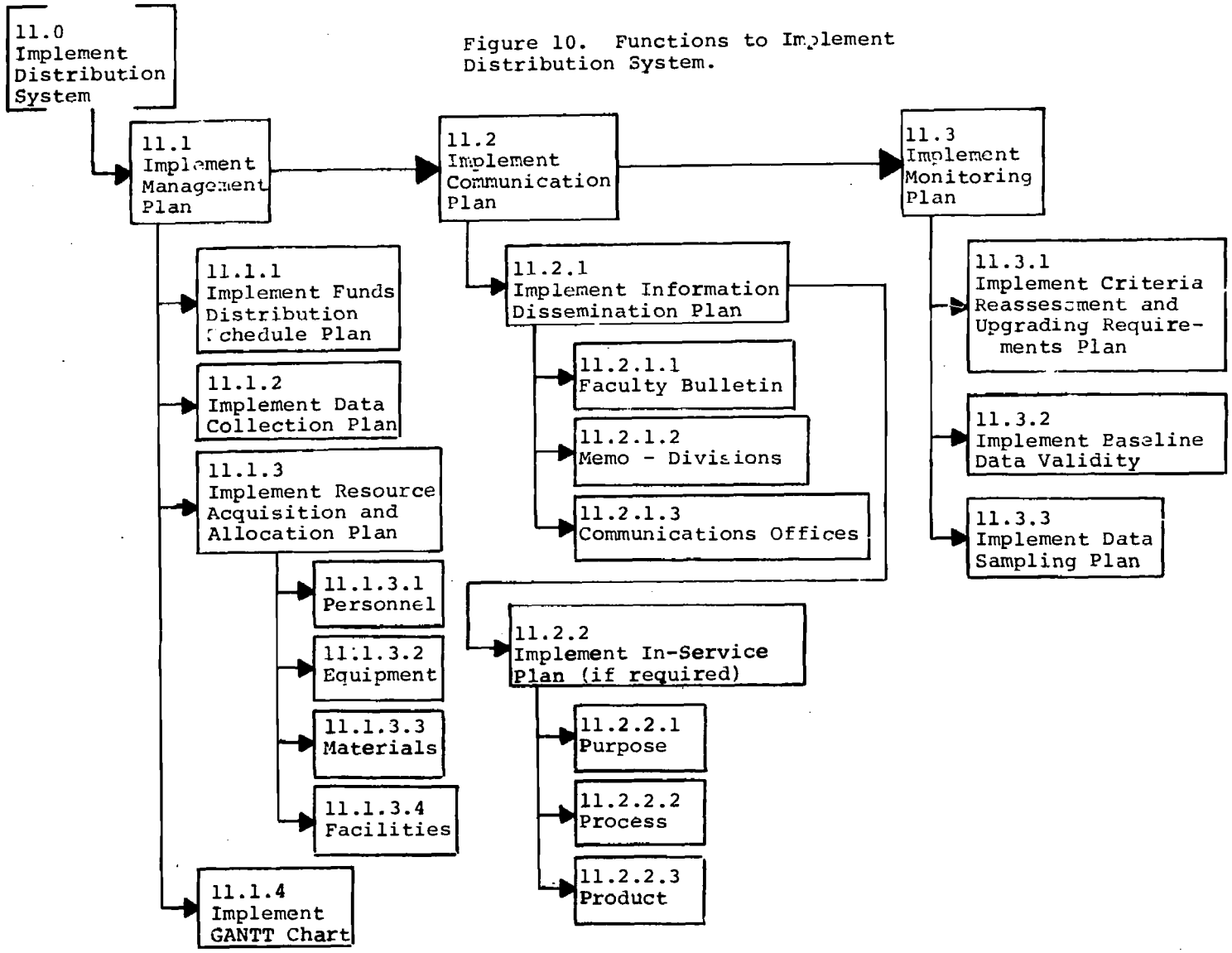


Figure 10. Functions to Implement Distribution System.

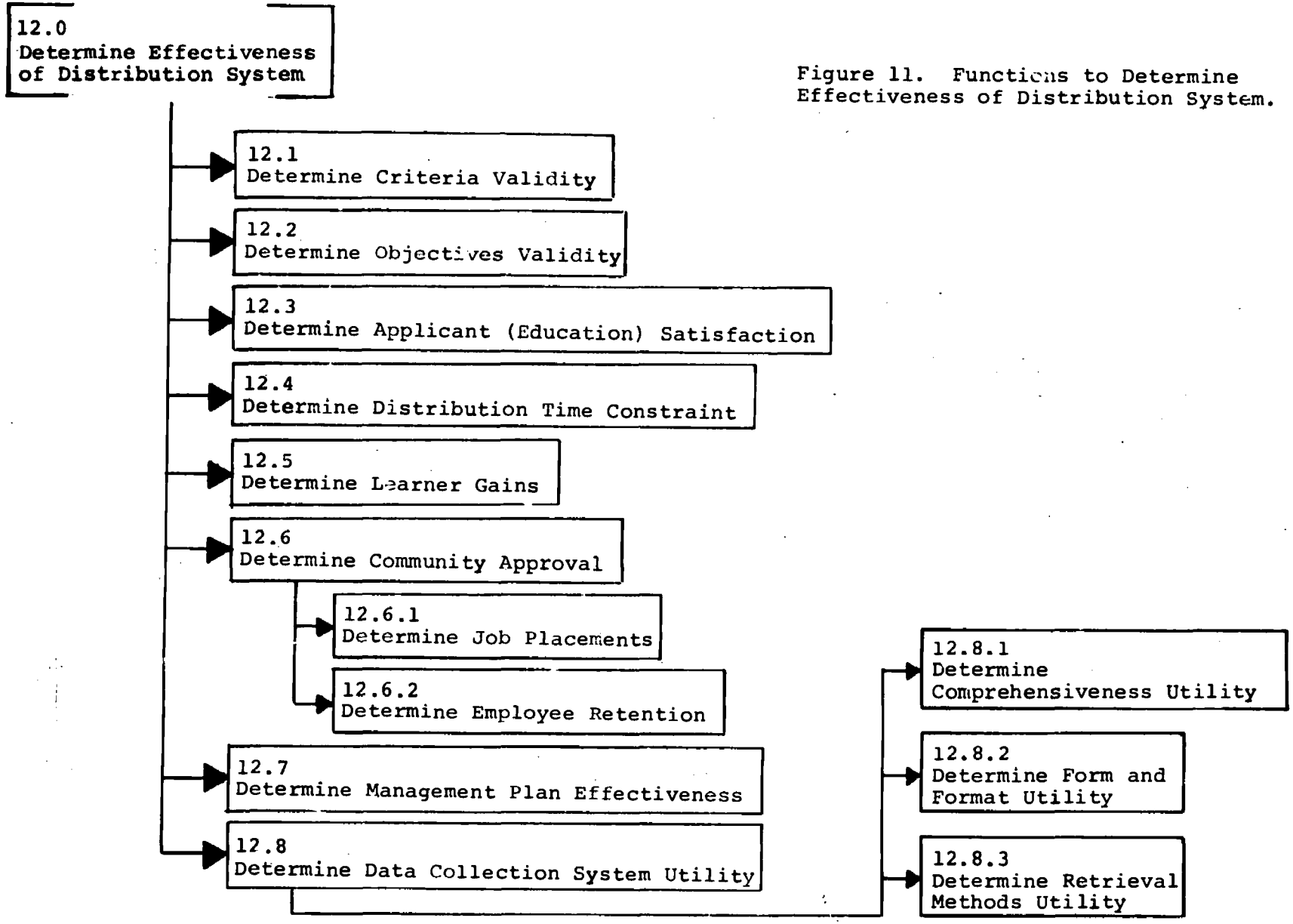


Figure 11. Functions to Determine Effectiveness of Distribution System.

Figure 12. Proposed Schedule for Accomplishing First Level Functions.

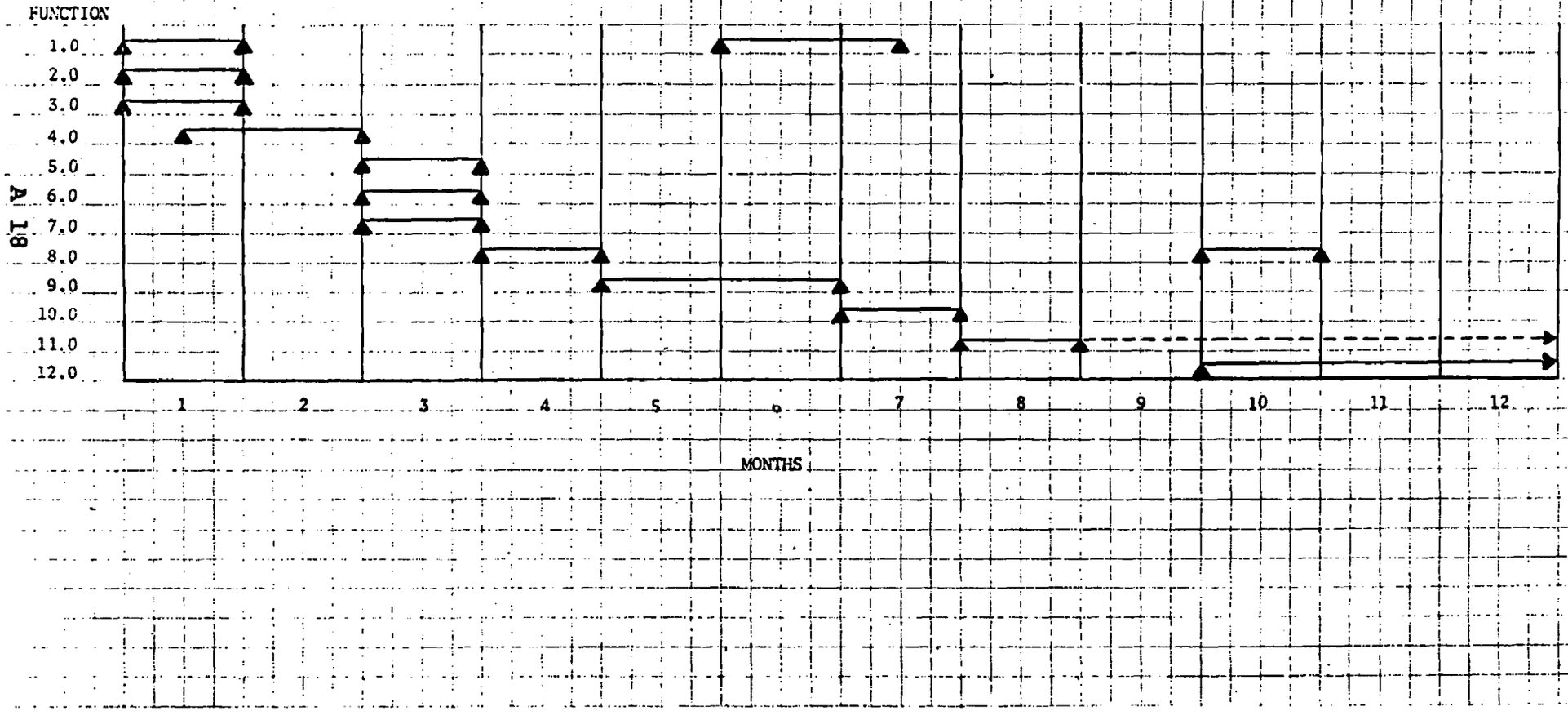
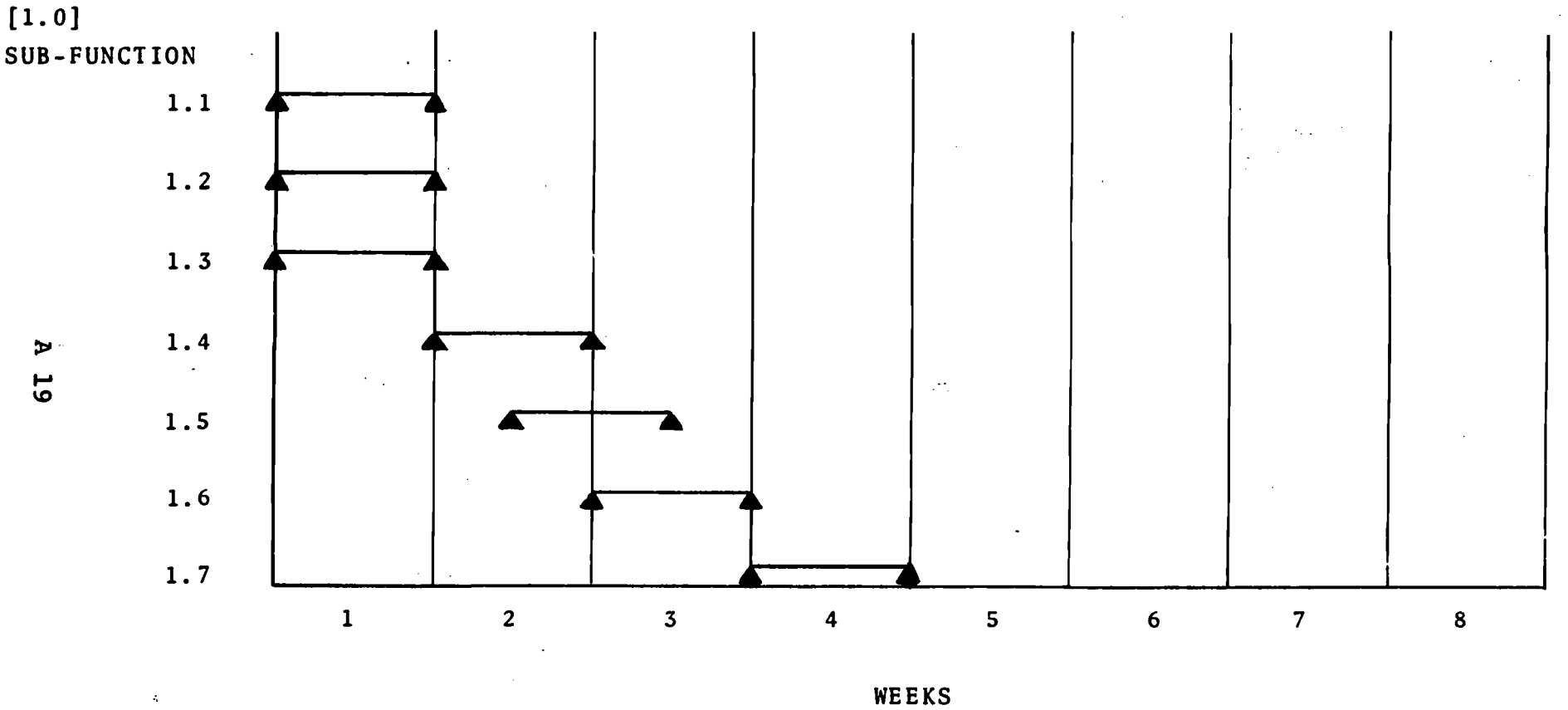


Figure 13. Proposed Schedule for Accomplishing Tasks for Function 1.0.



METHODS-MEANS ANALYSIS

OBJECTIVE	PERFORMANCE REQUIREMENTS	ALTERNATIVE		ADVANTAGES	DISADVANTAGES
		METHOD	MEANS		
1.0 Identify Learner Needs	Skill to perform required tasks	Hands on practice in college shop	Have proper equipment available in shop	Prepared for entry level job	Expense of latest equipment
	Gain proper attitudes toward subject field	Field trips to industry and class discussions involving employers	Schedule regular field trips and invite employers to classroom	Employers viewpoint essential to enforce instructors words	Extra time and expense of field trips
	Gain required knowledge of vocational area	Regular assigned theory discussions and valid testing procedure	Schedule theory classes separate from lab classes and validate tests	Student will learn WHY in addition to HOW	Takes time away from the skill training
	Learn relevancy of training program	Cooperative work experience program	Institute a work experience program in the community	Extension of hands on experience and learning to work with people	Academically disadvantaged students may not have time for work experience
2.0 Identify Educator Needs	Proper facilities to teach students required skills	Space, equipment, and supplies sufficient to train students	Have proper share of funds o purchase needed materials	Well-equipped shop attractive to students	High cost of some materials
	Advice of community employers	Advisory committee	Annual meeting	Validate program of instruction and need for materials	Difficulty of obtaining services of employers for meeting
	Cooperation of administration	Validate program	Use of advisory committee Placement of students	Instructor morale increased with validated program and cooperation of administration	Time and expense of gaining cooperation
	Satisfaction of student	Exhibit relevancy of program	Field trips and employer guest lecturers	Emphasizes instructors performance	Time and expense of field trips, and difficulty in obtaining guest lecturers
3.0 Determine Community Needs	Trained personnel and fit job requirements	Utilize qualified community college students	Contact instructors or Placement Office	Better prepared personnel lowers orientation cost on job	Maturity or experience may be lacking

METHODS-MEANS ANALYSIS (con't.)

	OBJECTIVE	PERFORMANCE REQUIREMENTS	ALTERNATIVE		ADVANTAGES	DISADVANTAGES
			METHOD	MEANS		
3.0	Determine Community Needs (continued)	Participation in community college program organization	Participate on advisory committee	Contact college representative and be available	Input by community towards requirements and relevancy of training program	Pressure of large company needs sways committee
		Profit from results of business/industry	Qualified employees	Employ trained or experienced personnel	Greater production, higher salaries possible	
4.0	Determine Specific Goals of Vocational Education Curriculums	To qualify students for employment in the business/industry world	Laboratory experience and related theory in subject curriculums	Schedule students time in proper proportion of lecture and lab hours	Students will gain SKA towards world of work	Possibility of excessive theoretical training at expense of hands-on experience
		To provide students with the basic knowledge needed by all persons for effective living in our society	Prepare curriculums which include approved general education subjects	Use of advisory committee	Essentials required by employers will be covered	Difficulty in obtaining majority opinion on subjects to be covered
5.0	Translate Goals into Measureable Objectives	Perceived as relevant by students	Field experience plus classroom theory			
		Provide for developmental learning		Programmed sequence (branching)		
		Provide for student differences at entry		Diagnostic entry level testing		

MISSION PROFILE

for

DEVELOPMENT OF PROCEDURES FOR DATA MANAGEMENT

RELATIVE TO ADMINISTRATIVE DECISION MAKING

by

Charles Davis

MISSION OBJECTIVE

By June 2, 1972, Charles Davis, his staff, and other selected personnel will develop and implement a system of procedures for data collection to be used in decision making and the preparation of state and federal reports.

PERFORMANCE REQUIREMENTS

1. Pending questions shall be ranked by the Administrative Council each year prior to the development of any survey material.

2. Survey development shall consider the top three questions on the list and at least two of the next five.

3. Data will be gathered and on file prior to the time required to complete all questionnaires specified by the Administrative Council at the time of the development of survey material.

4. Data gathered shall supply at least 90% of the information asked for on the forms which is applicable to the college during the first year. In succeeding years, not to exceed three, the percentage shall increase to 95%.

5. The adequacy of data gathered to assist in decision making shall be judged by the absence of those questions on the following year's list of pending questions. A third recurrence of the same question will result in a report of causal factors to the Administrative Council.

6. The system developed will be acceptable to administration, staff, and students as reflected by the following:

   A. Formal approval by the Administrative Council

   B. Forms completed under the direction of teachers shall reflect 90% usable returns

   C. Forms completed by mail shall reflect the following minimums:

      -- Addresses less than three months old -- 50%
      -- Addresses over three but less than six -- 30%
      -- Addresses over six but less than 1 year -- 15%
      -- Addresses over 1 year old -- no minimum

7. All data requested on initial survey instruments will be suitable for summarization in quantitative form. Follow-up survey instruments, if any, may contain non-quantifiable data.

8. Results must be tabulated, organized, and distributed to the Administrative Council on schedule as set up in the plan.

Surveys, when applicable, should include students, faculty, and community.

10. Development should include the following time requirements:

    A. Require "minimum" time of Coordinator of Research and Development and other staff for report preparation, i.e., two weeks following receipt of data.

    B. Survey forms administered when the information is easily available and there is simple distribution and return; a pre-specified time-activity schedule will be used to assure leadtime, as indicated by at least 90% of returns with requested time limits.

11. Information should be gathered to answer questions on such forms as:

    A. VEA 45

    B. HEGIS Community College Supplement

    C. CCAF 132

    D. Student ethnic and financial data

EDUCATIONAL NEEDS

Needs in the areas of student outcomes upon terminating and perceptions of adequacy of instruction in preparing students for employment:

WHAT IS	WHAT SHOULD BE
STUDENTS	
1. Insufficient baseline information for proper program placement, based upon procedures, forms, and requirements for data recording.	1. Profiles containing all required information of each entering student should be obtained prior to program placement.
2. Inadequate system of student follow-up subsequent to his termination from community college.	2. 25% of students identified and tracked as representative sample.
3. ___% of all students who earn a Certificate of Proficiency receive the award.	3. Increase the number of Certificate of Proficiency awards by 20% per year until 85% of all placements result in award.
4. Some training irrelevant to employer requirements, based upon representative advisory committee feedback.	4. Relevant training reflected in perception indicated on survey and increase in Certificate of Proficiency awards.
5. Employment obtained and training received do not bear a close enough relationship, based upon representative advisory committee feedback and periodic departmental survey.	5. 75% of returned survey instruments should show training received directly related to job.
EDUCATORS	
1. Decisions made with inadequate information, based upon informality and inconsistency of data recording and processing.	1. 100% of identified data required are obtained prior to major programmatic decisions, with provisions for data updating.
2. Information on students, in its present form and format, has marginal reliability and use, based upon no established procedure for gathering data or on updating forms.	2. Student data are received continuously pursuant to identified data requirements and format, using an interdepartmental form and schedule.
3. Counseling procedures provide insufficient data on student interest and progress, based upon counselor-counselee ratio and no established policy/procedure/instrument for making valid determination.	3. Counseling program based upon employer requirements, student needs, and course content provisions, implemented upon approval by representative advisory committee and department chairmen.
4. ___% of students entering particular training programs seem inappropriately placed, based upon transfers to other programs and terminations.	4. Not more than 10% student transfer to other programs; termination reduced to 10%.
5. Feedback from employers is insufficient to make programmatic decisions, based upon no formal means or requirement to communicate program intent or to obtain data on employers requirements.	5. Data on employer perceptions of program adequacy shall be 75% of returned responses from 25% sample sent.

WHAT IS

COMMUNITY

WHAT SHOULD BE

1. Poor job-graduate mix, based upon informal surveys of graduates in the area.

1. Narrow the gap in job-graduate mix as reflected by an increased ratio of calls by employment office to graduates.

2. Graduates in identifiable instances not trained to level required by industry, based upon informal survey results of the quality of performance of graduates.

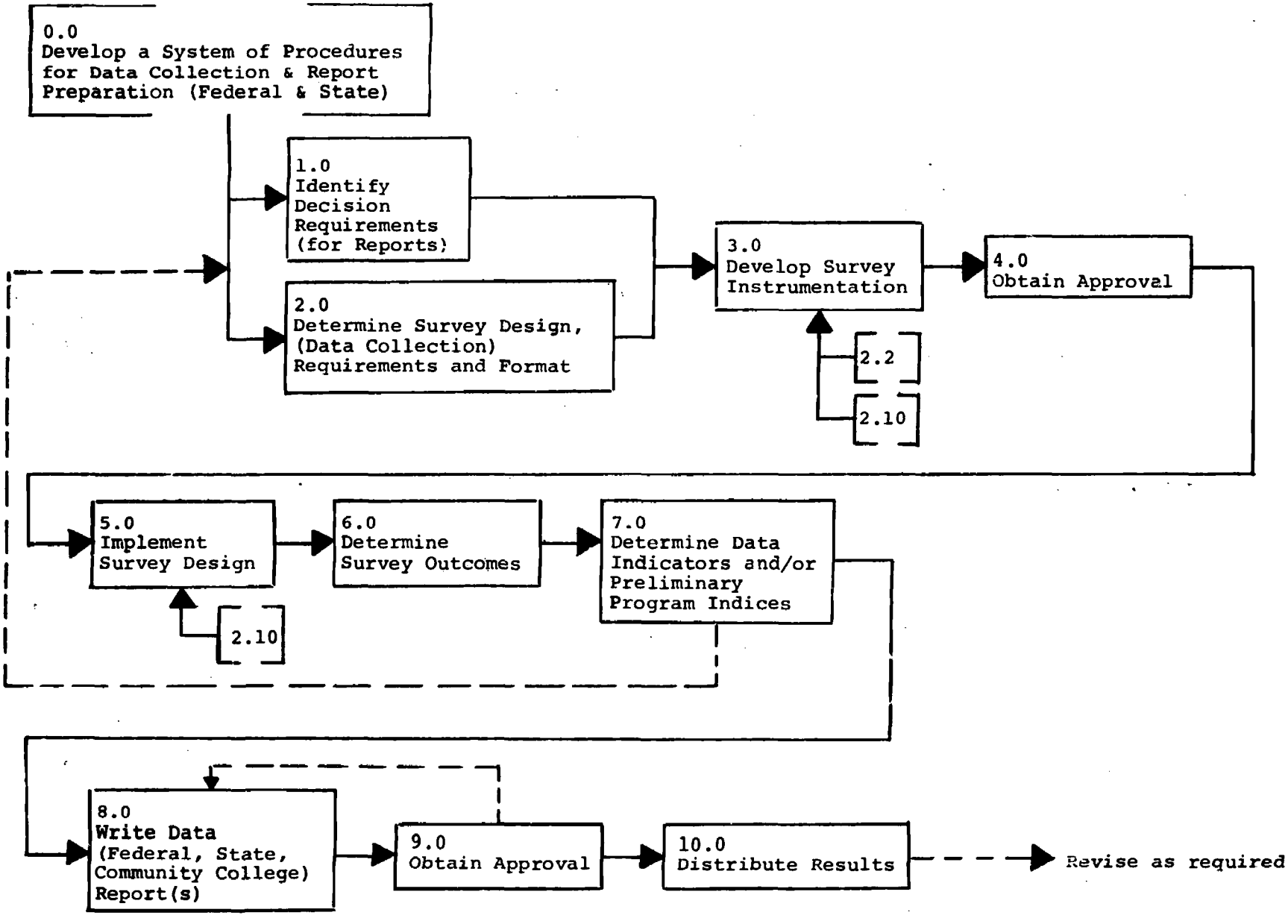
2. Training adequate:

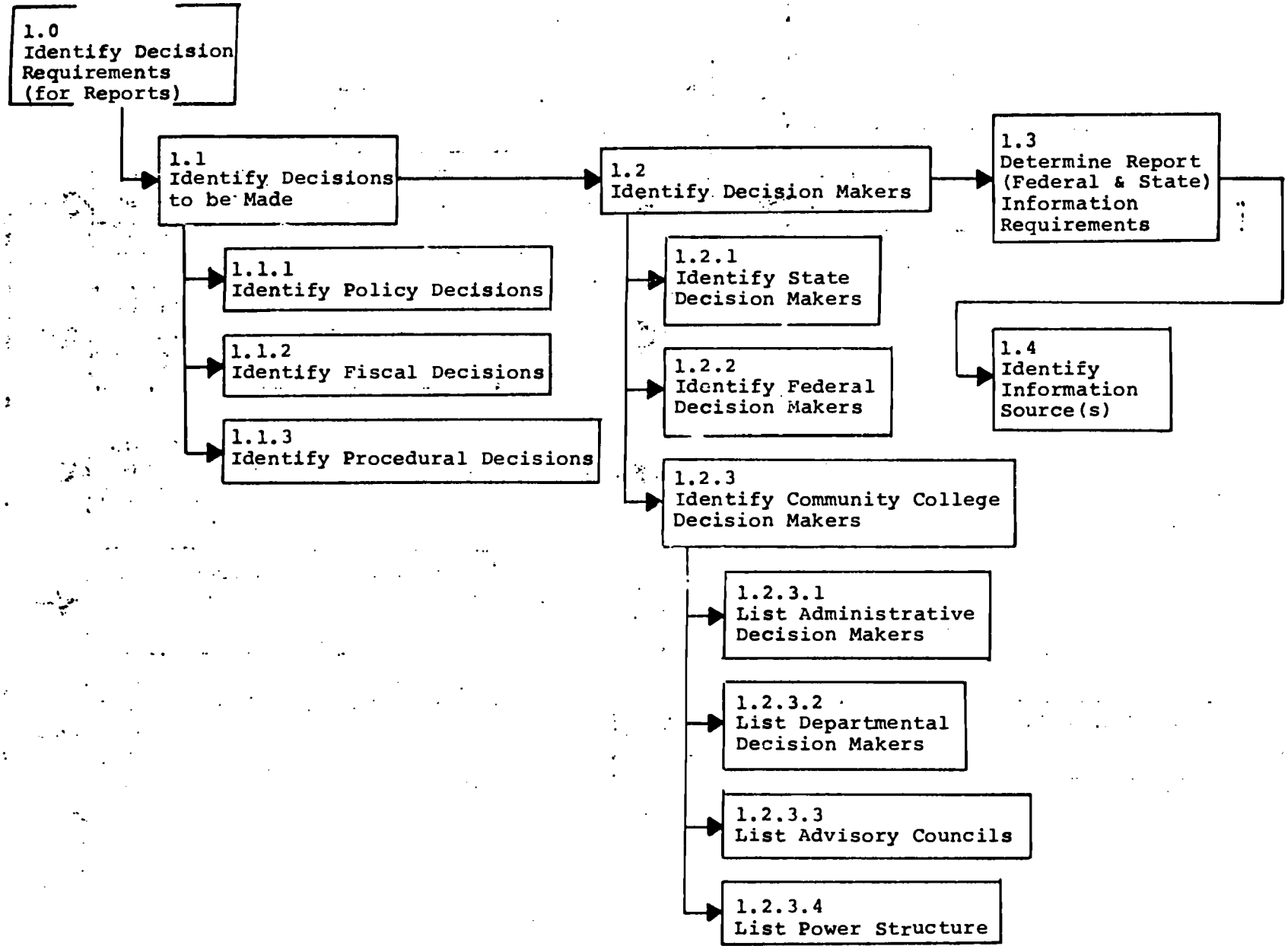
   A. indicated by survey of industry, 80:75, i.e., 80% of employed graduates will be able to perform at least 75% of the work required by employers.

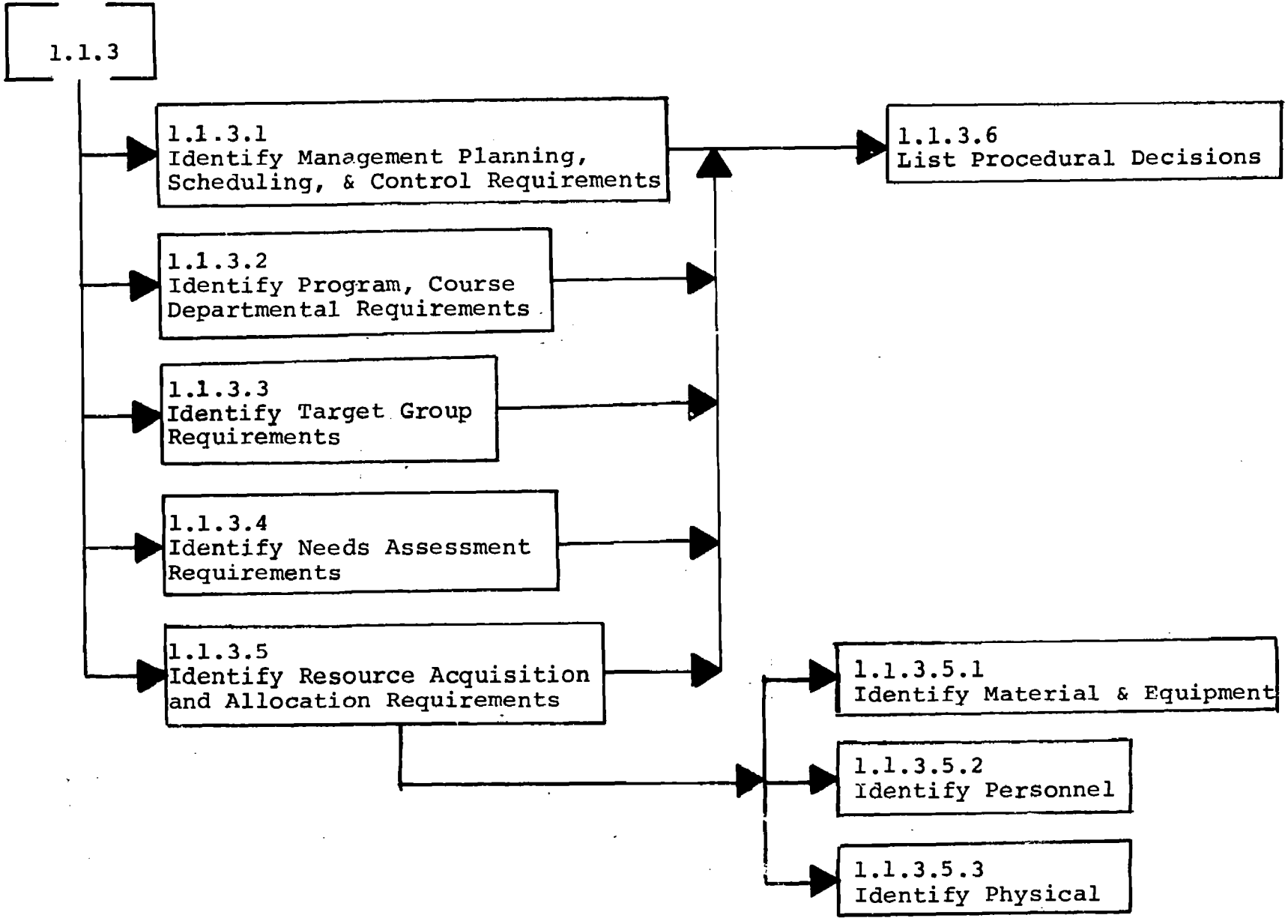
   B. indicated by increase in Certificates of Proficiency, 20:90, i.e., 20% of employed graduates will be able to perform at least 90% of the work required by employers.

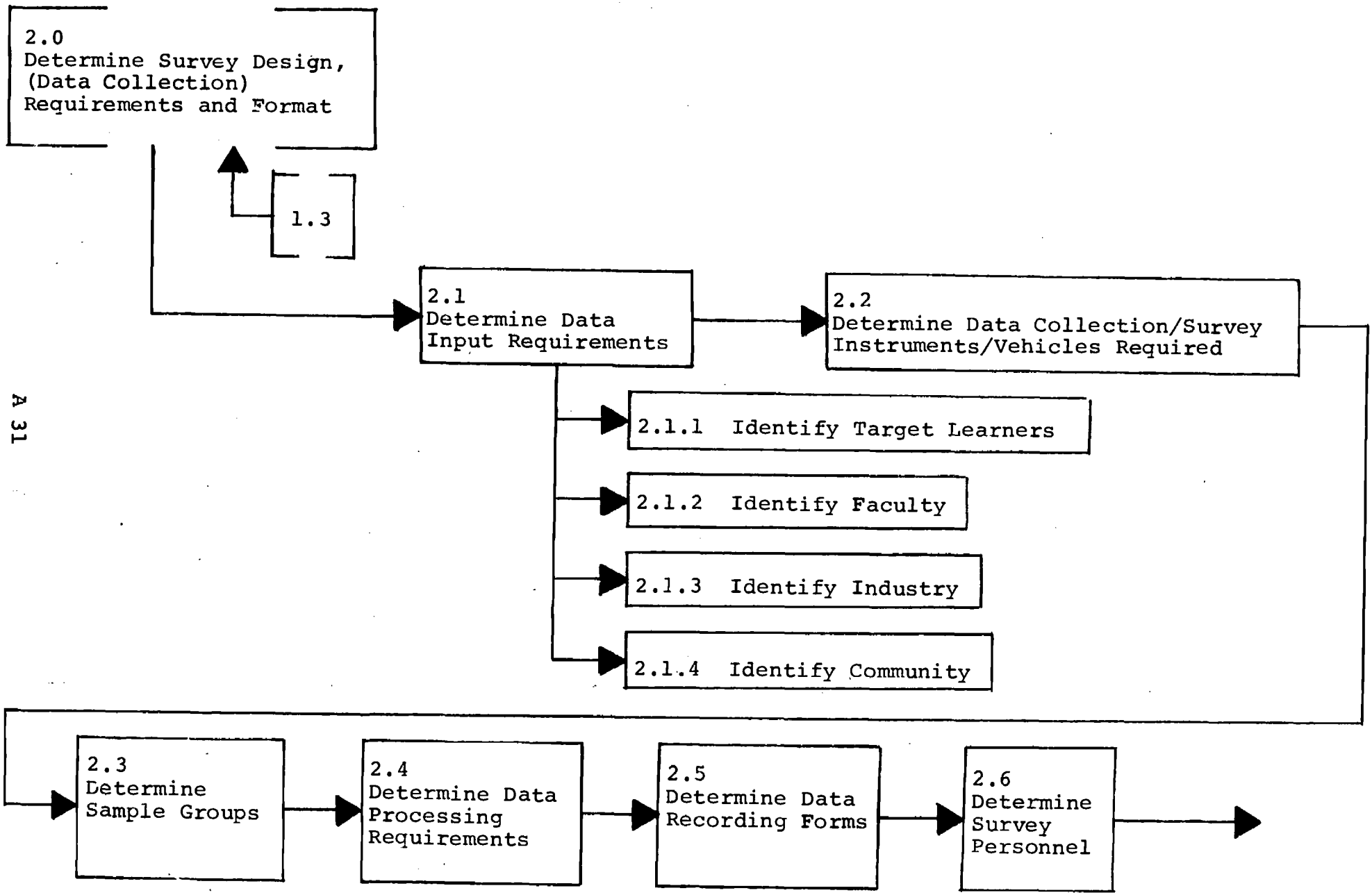
3. High incidence of unemployed and/or short-term employed graduates, based upon departmental phone survey of recent graduates (within last two years).

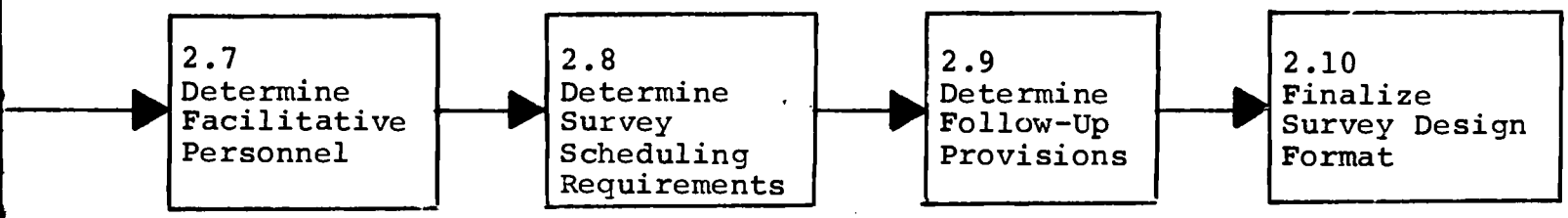
3. Graduates enter job market, possessing specific marketable skills, have a low turn-over ratio. 5% or less of graduates are unemployed because of inadequate training.

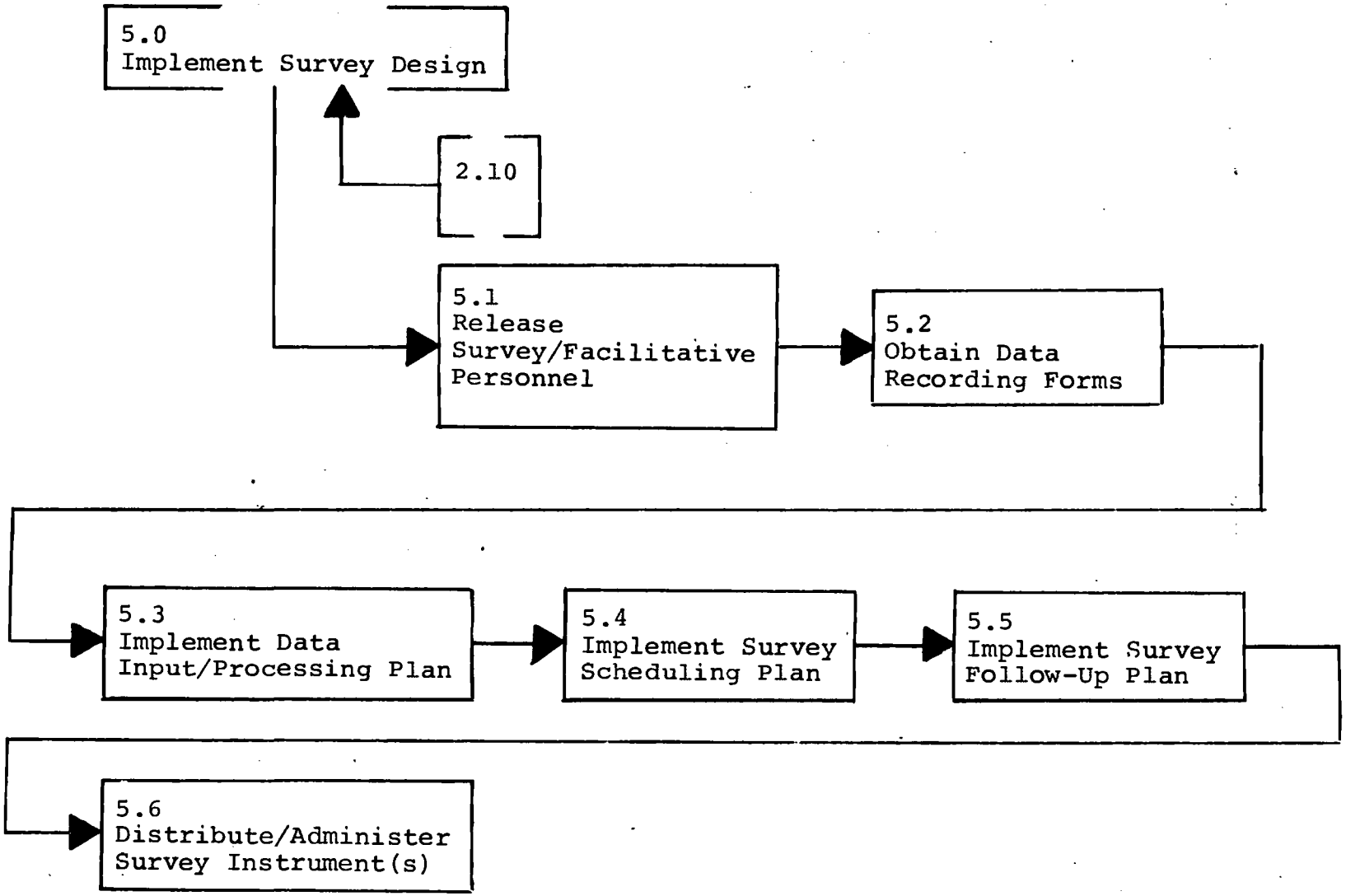

0.0
Develop a System of Procedures for Data Collection & Report Preparation (Federal & State)
1.0
Identify Decision Requirements (for Reports)
2.0
Determine Survey Design, (Data Collection) Requirements and Format
3.0
Develop Survey Instrumentation
2.2
2.10
4.0
Obtain Approval
5.0
Implement Survey Design
2.10
6.0
Determine Survey Outcomes
7.0
Determine Data Indicators and/or Preliminary Program Indices
8.0
Write Data (Federal, State, Community College) Report(s)
9.0
Obtain Approval
10.0
Distribute Results
Revise as required

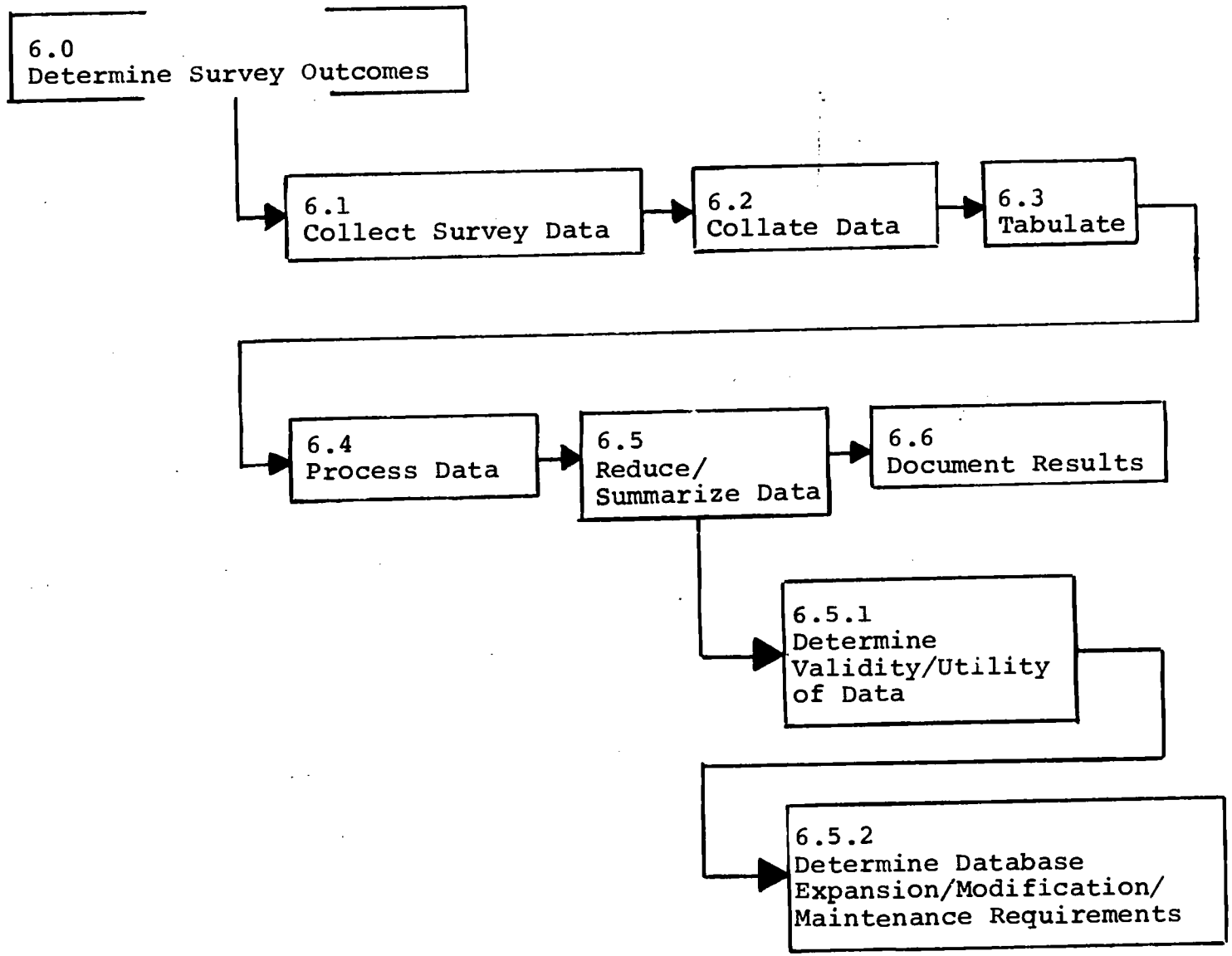

1.0
Identify Decision Requirements (for Reports)
1.1
Identify Decisions to be Made
1.1.1
Identify Policy Decisions
1.1.2
Identify Fiscal Decisions
1.1.3
Identify Procedural Decisions
1.2
Identify Decision Makers
1.2.1
Identify State Decision Makers
1.2.2
Identify Federal Decision Makers
1.2.3
Identify Community College Decision Makers
1.2.3.1
List Administrative Decision Makers
1.2.3.2
List Departmental Decision Makers
1.2.3.3
List Advisory Councils
1.2.3.4
List Power Structure
1.3
Determine Report (Federal & State) Information Requirements
1.4
Identify Information Source(s)

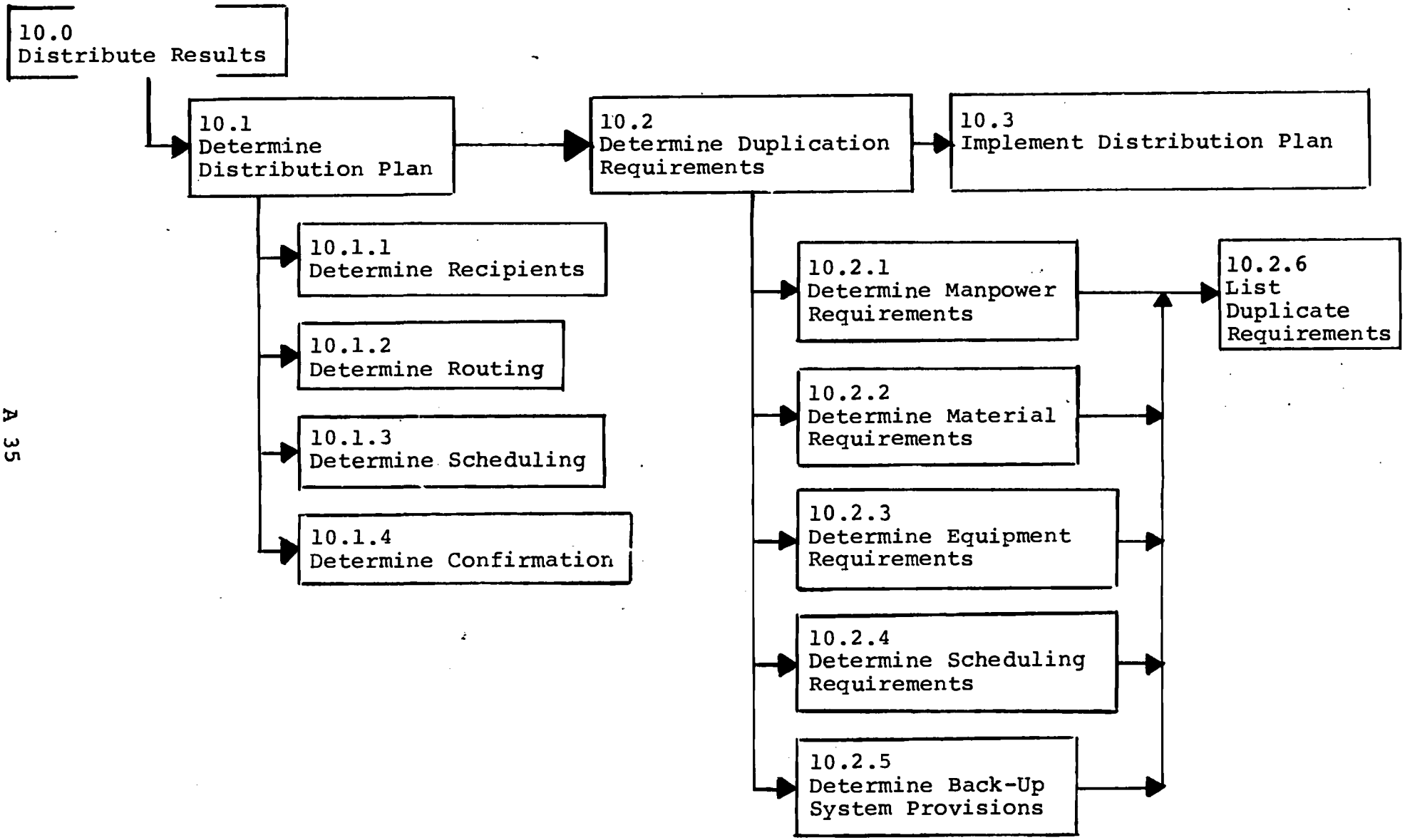

1.1.3
1.1.3.1
Identify Management Planning, Scheduling, & Control Requirements
1.1.3.2
Identify Program, Course Departmental Requirements
1.1.3.3
Identify Target Group Requirements
1.1.3.4
Identify Needs Assessment Requirements
1.1.3.5
Identify Resource Acquisition and Allocation Requirements
1.1.3.6
List Procedural Decisions
1.1.3.5.1
Identify Material & Equipment
1.1.3.5.2
Identify Personnel
1.1.3.5.3
Identify Physical


2.0
Determine Survey Design, (Data Collection) Requirements and Format
1.3
2.1
Determine Data Input Requirements
2.2
Determine Data Collection/Survey Instruments/Vehicles Required
2.1.1 Identify Target Learners
2.1.2 Identify Faculty
2.1.3 Identify Industry
2.1.4 Identify Community
2.3
Determine Sample Groups
2.4
Determine Data Processing Requirements
2.5
Determine Data Recording Forms
2.6
Determine Survey Personnel


2.7
Determine
Facilitative
Personnel
2.8
Determine
Survey
Scheduling
Requirements
2.9
Determine
Follow-Up
Provisions
2.10
Finalize
Survey Design
Format


5.0
Implement Survey Design
2.10
5.1
Release
Survey/Facilitative
Personnel
5.2
Obtain Data
Recording Forms
5.3
Implement Data
Input/Processing Plan
5.4
Implement Survey
Scheduling Plan
5.5
Implement Survey
Follow-Up Plan
5.6
Distribute/Administer
Survey Instrument(s)


6.0
Determine Survey Outcomes
6.1
Collect Survey Data
6.2
Collate Data
6.3
Tabulate
6.4
Process Data
6.5
Reduce/
Summarize Data
6.6
Document Results
6.5.1
Determine
Validity/Utility
of Data
6.5.2
Determine Database
Expansion/Modification/
Maintenance Requirements


10.0
Distribute Results
10.1
Determine
Distribution Plan
10.2
Determine Duplication
Requirements
10.3
Implement Distribution Plan
10.1.1
Determine Recipients
10.1.2
Determine Routing
10.1.3
Determine Scheduling
10.1.4
Determine Confirmation
10.2.1
Determine Manpower
Requirements
10.2.2
Determine Material
Requirements
10.2.3
Determine Equipment
Requirements
10.2.4
Determine Scheduling
Requirements
10.2.5
Determine Back-Up
System Provisions
10.2.6
List
Duplicate
Requirements

MISSION PROFILE

for

COST/BENEFIT ANALYSIS MODEL

FOR VOCATIONAL EDUCATION PROGRAMS

by

Fred E. Ittner

ERIC

COST/BENEFIT ANALYSIS, VEA, PART "C"

MISSION OBJECTIVE

By June 30, 1972, the principle investigator of the VEA Project #01-61267-C101-71, (Fred E. Ittner, Business Division Chairman), will develop a model which will, when used, determine the dollar benefit of vocational education programs by measuring the cost per student placed in the vocational area for which he is trained with the income of students placed. The costs will include all identifiable direct and indirect costs. Income will be derived from a stratified random sample of at least twenty percent of the graduates placed during each of the past five years. Resulting data will be approved by the Dean of Vocational Education, College of Alameda.

PERFORMANCE REQUIREMENTS

1. The model developed at College of Alameda will be exportable/usable at other colleges as judged by at least four of five vocational deans from other colleges in California.

2. Costs shall include all direct and indirect costs, including salaries of instructors, portions of salaries for counseling and administrative functions, supplies, equipment, and building space used by the program.

3. Total cost shall be divided by the number of students placed to determine the costs per students placed.

4. Income per student shall be on a value-added basis:

   A. Value-added shall be arrived at by comparing the actual or expected incomes without training to income after training.

   B. Income without training shall be determined by Department of Human Resources Development information on salaries of people with education levels similar to those in the vocational program.

   C. --or by income levels actually obtained by students prior to entering the programs.

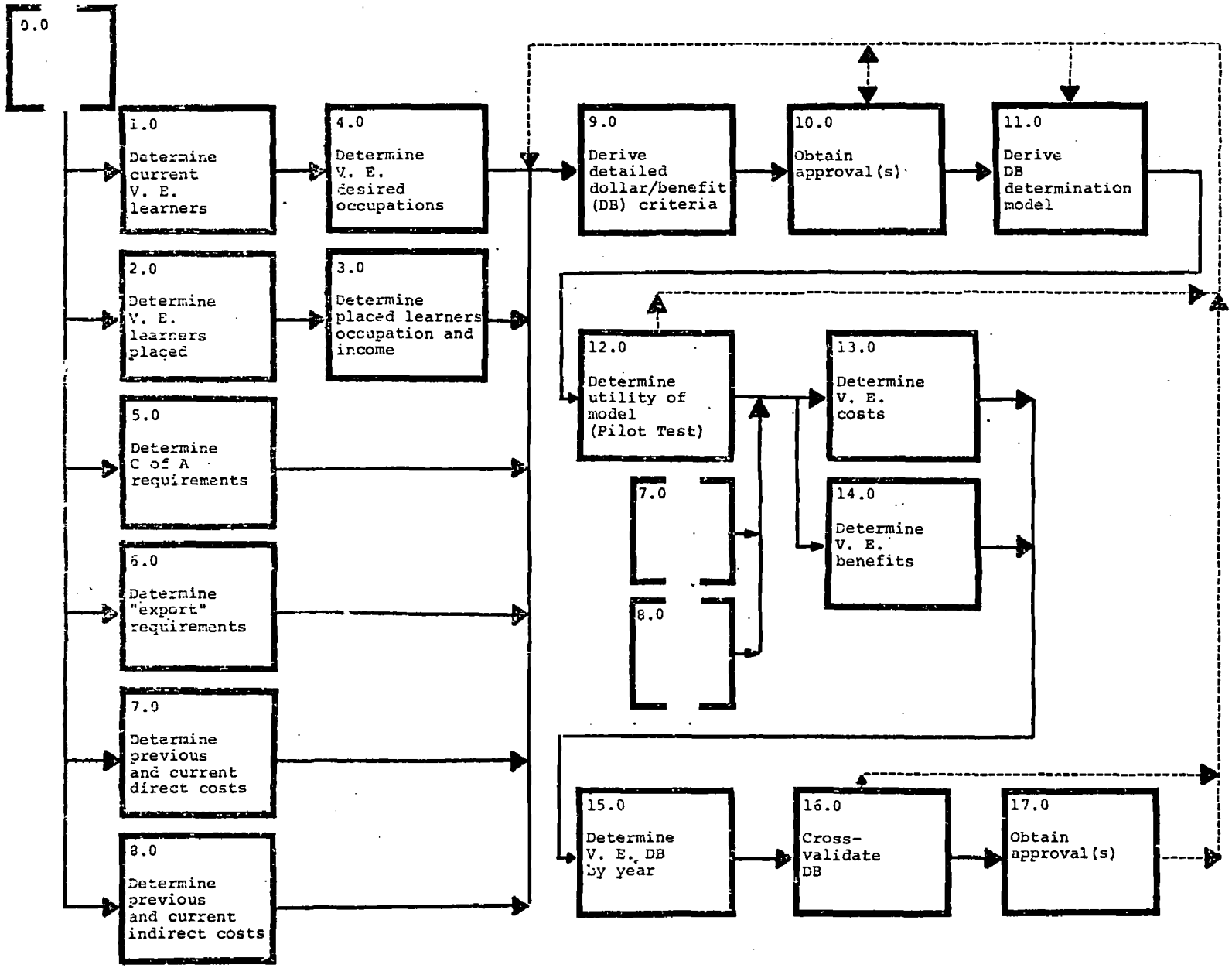
5. The number of students placed shall be identified by college placement records and records showing certificates of completion.

6. Twenty percent of the students placed shall be randomly selected from all placements, with proportional representation of each Vocational Education specialty within College of Alameda.

7. Results shall be expressed in return on investment for vocational programs.

8. Return on Investment formula will be as follows:

$$\begin{pmatrix}\text{Return}\\ \text{on}\\ \text{Investment}\end{pmatrix} = \frac{\begin{pmatrix}\text{Income first year}\\ \text{after training}\end{pmatrix} - \begin{pmatrix}\text{Annual income}\\ \text{without training}\end{pmatrix}}{\text{(Cost of program per student placed)}}$$


0.0
1.0
Determine current V. E. learners
2.0
Determine V. E. learners placed
3.0
Determine placed learners occupation and income
4.0
Determine V. E. desired occupations
5.0
Determine C of A requirements
6.0
Determine "export" requirements
7.0
Determine previous and current direct costs
8.0
Determine previous and current indirect costs
9.0
Derive detailed dollar/benefit (DB) criteria
10.0
Obtain approval(s)
11.0
Derive DB determination model
12.0
Determine utility of model (Pilot Test)
7.0
8.0
13.0
Determine V. E. costs
14.0
Determine V. E. benefits
15.0
Determine V. E. DB by year
16.0
Cross-validate DB
17.0
Obtain approval(s)

MISSION PROFILE

for

MODEL DEVELOPMENT FOR A MASTER PLAN

TO IMPLEMENT VOCATIONAL-TECHNICAL EDUCATION PROGRAMS

by

Louis Trapp

MISSION OBJECTIVE

By September, 1973, the area coordinator for vocational education (G. Louis Trapp) will develop a model for a master plan to implement vocational-technical education for Los Medanos Community College. The plan will include all requirements necessary for implementation relative to the needs of students, educators, and community.

PERFORMANCE REQUIREMENTS

1. A need is defined as the measurable discrepancy between a required condition and a current condition -- the gaps between "what is" and "what should be."

2. Needs will be determined for and by learners, educators, and community.

3. A measurable objective will conform to the criteria for stating measurable objectives as defined by Mager, R. F., ("Preparing Instructional Objectives").

4. What is developed in the master plan will be accepted by at least 80% of the following persons as determined on a broken five-point scale from completely accepted to completely rejected. Consensus will be S.A. or C.A.

   EXAMPLE:

C.A.	S.A.	U.	S.R.	C.R.
Completely Acceptable	Somewhat Acceptable	Undecided	Somewhat Rejected	Completely Rejected

   1. Board of Trustees
   2. C.C. Superintendent
   3. C.C. President
   4. Deans

5. The model will provide for determining the needs of target students, educators in the district, and the communities served by the college as indicated by at least 60% of each group approving the model.

6. The identified needs will be placed in priority order using an established set of criteria for determining priority, and will be approved by at least 60% of each group.

7. The selected priority needs will be translated into performance requirements to be achieved in terms of student behavior, and certified as acceptable by the project director.

8. Measurable objectives will be established for every student program offered in vocational-technical education at the college, and certified as acceptable by the project director.

9. At least three alternative learning strategies will be developed and considered for every program offered.

10. Program strategies will be selected using a set of developed criteria approved by:

    A. Community College Board

    B. Community College District Superintendent

    C. Community College President

11. The alternative program strategies selected will be approved by at least 75% of each of the following:

    A. Deans

    B. Counselors

    C. Department or Division Chairmen

    D. Involved departmental or division faculty

    E. Representative learners for departments

12. In program strategy selection, at least one of the criteria to be used is that of cost-effectiveness. Definition:

    $$\text{Input cost} \leq \text{Return on Investment}$$

13. A management plan will be developed for each program to insure: (a) Objectives of the program are achieved; (b) The program specifications have been met; (c) The planning will be on time; (e) Within projected resources -- financial, material, and personnel -- allocated to the program, and will be approved by the advisory council.

14. Every developed program will provide for formative and summative evaluation of student outcome. The focus for evaluation will be to provide information on which to make decisions, re: revision requirements.

15. Every program will be revised as required as indicated by the formative and summative evaluations, and will be able to demonstrate where such changes have been made.

16. Any plan, when implemented, will result in:

A. Ninety percent of all learners will reach 90% of all learning objectives.

B. There will be a measurable improvement (.05 level of confidence or beyond) in:

1. Learner self-concept as measurable by one or more of the following:

a. Locally constructed self-concept instrument

b. Sorenson Self-Concept Inventory

c. Other valid published or non-published self-concept inventory

2. Educator morale as determined by one or more of the following:

a. Educator self-report

b. At least 10% decrease in absentee rate

c. At least 10% increase in retention rate at end of school year

d. At least 10% increase in faculty publications

e. At least 10% increase in assuming voluntary assignments

Note from B-E: Over the average of the other community college campuses in the district (or) over the average of the previous two years at Los Medanos Community College.

3. Community acceptance of programs and outcomes as determined by three or more of the following:

a. Sixty percent or more of a random sample of managers of businesses and industries in the community college district regarding at least "acceptable" on a series of two or more five-point scales relating to community college outcomes and programs.

b. Ten percent or more reduction in letters and phone calls of complaint as compared with (1) the average of the other community colleges in the district, or, (2) the average of the previous two years at Los Medanos Community College.

c. At least a 5% increase of enrollment in classes in vocational-technical education during each of the second through sixth years from the opening of the colleges as compared with the previous years.

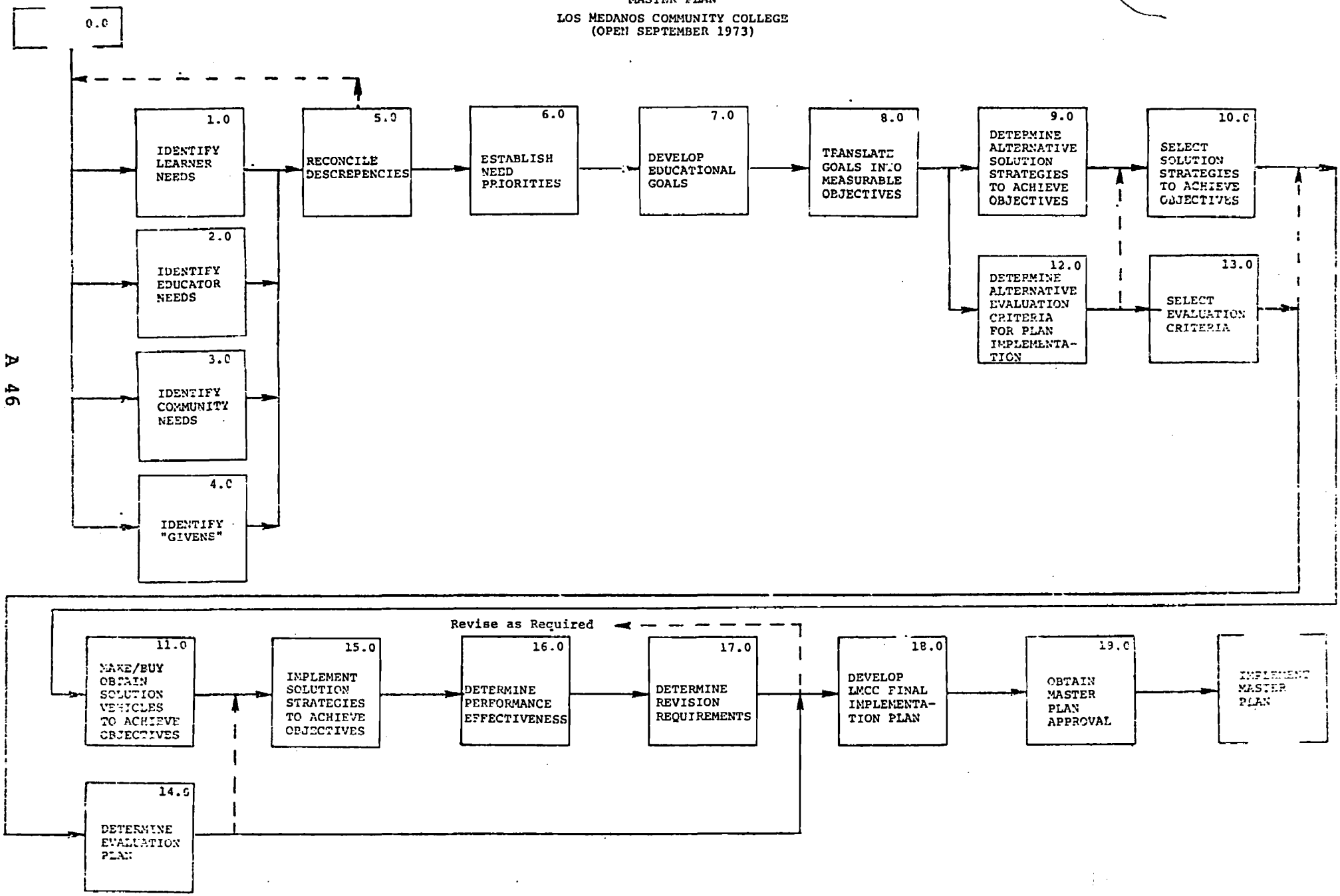
d. Sixty percent or more of the students responding at least "acceptable" on a series of two or more five-point scales relating to community college outcomes and programs.

e. At least a 10% increase in student achievement of learning objectives per unit of cost as compared with the average of the other community college campuses in the district.

MISSION PROFILE

MASTER PLAN

LOS MEDANOS COMMUNITY COLLEGE
(OPEN SEPTEMBER 1973)



MISSION PROFILE

for

A MANAGEMENT INFORMATION SYSTEM PLAN

FOR STATE-REQUIRED VOCATIONAL EDUCATION REPORTS

by

Arthur Cherdack

Joseph Berruezo

Arthur D'Braunstein

MISSION OBJECTIVE

VEA REPORTS

Given the table of submittal dates for State-required vocational education documents, at least 12 months prior to the beginning of the fiscal year, and the assumption that the date required does not change, within two (2) weeks after receiving VE reports (45, 47, 48) during instructional periods, the VE director and staff will complete said reports by providing all the required information. Information will be without error and will meet state minimum specifications and be approved by the State Chancellor's Office.

PERFORMANCE REQUIREMENTS

1. State deadline dates will be met provided VE reports are received at least 10 working days prior to the deadline.

2. A completed plan will be developed which will include the design of a data bank system. The type of data bank system employed will be agreed upon by the vocational education director and VE staff and other parties designated by the VE director.

3. The data bank system will include three phases of activity, namely, collection, storage, and retrieval of data.

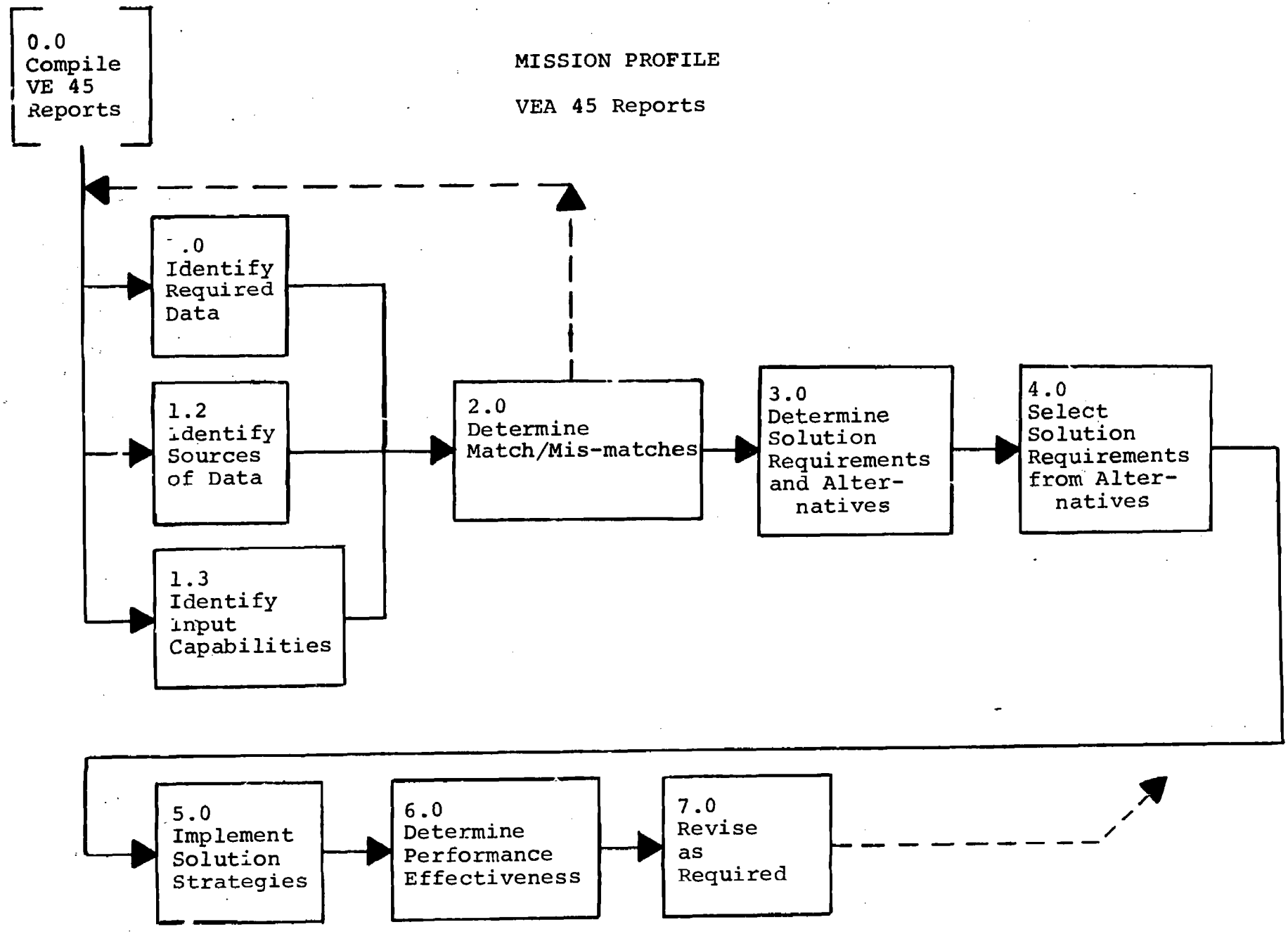
   A. Collection is defined as the process of gathering of data.

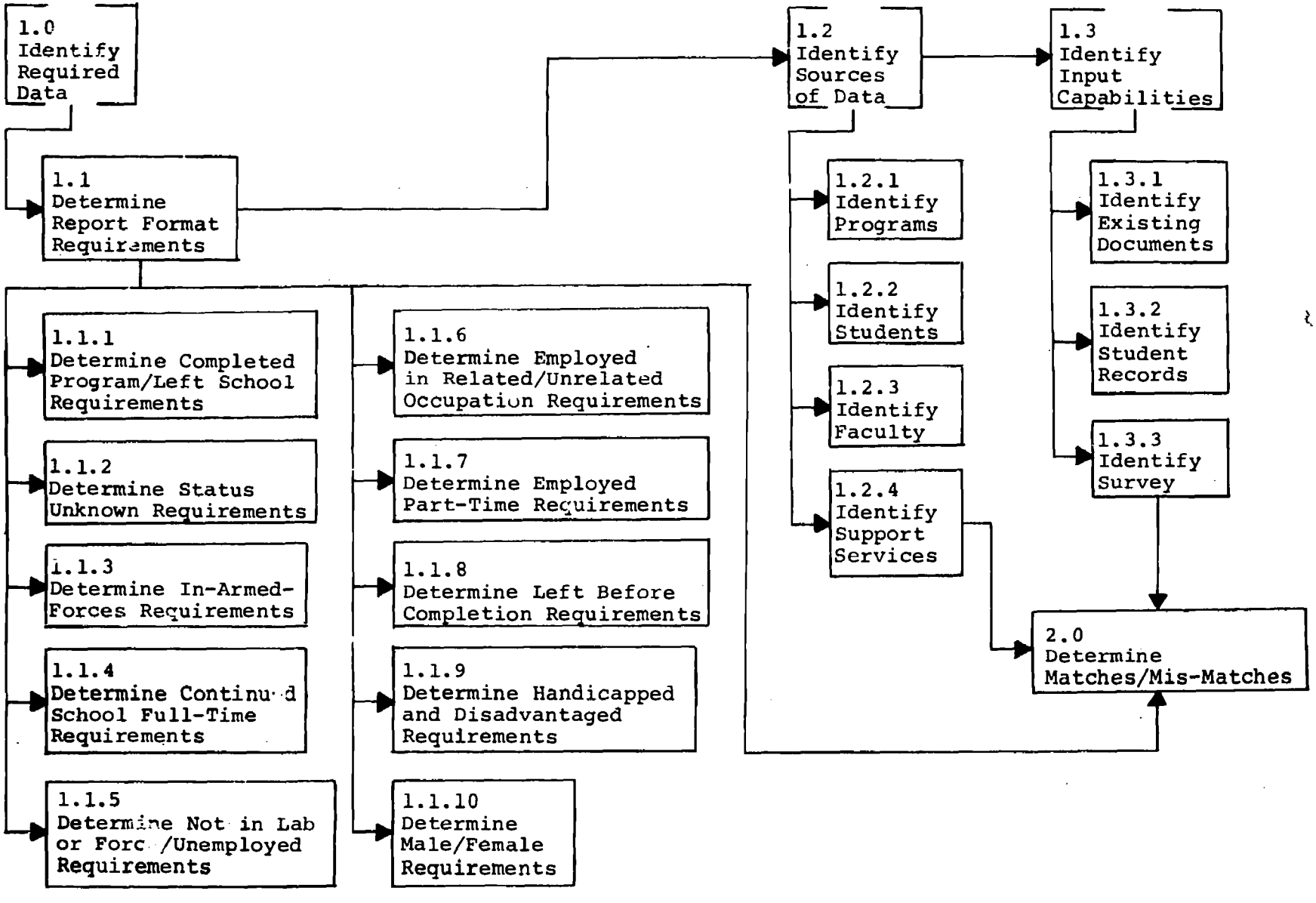
   B. Storage is defined as the process of storing data.

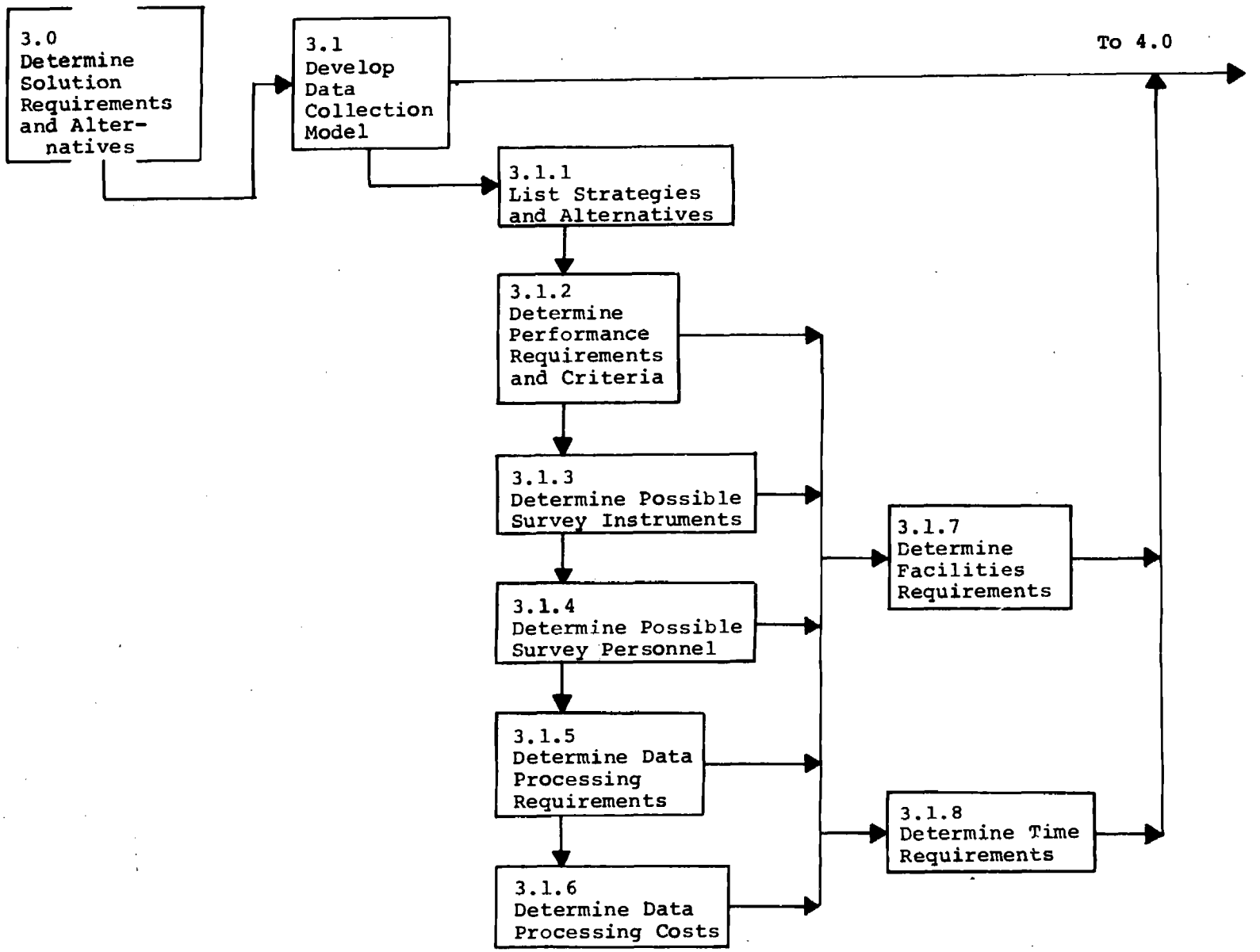
   C. Retrieval is defined as the process of retrieving data.

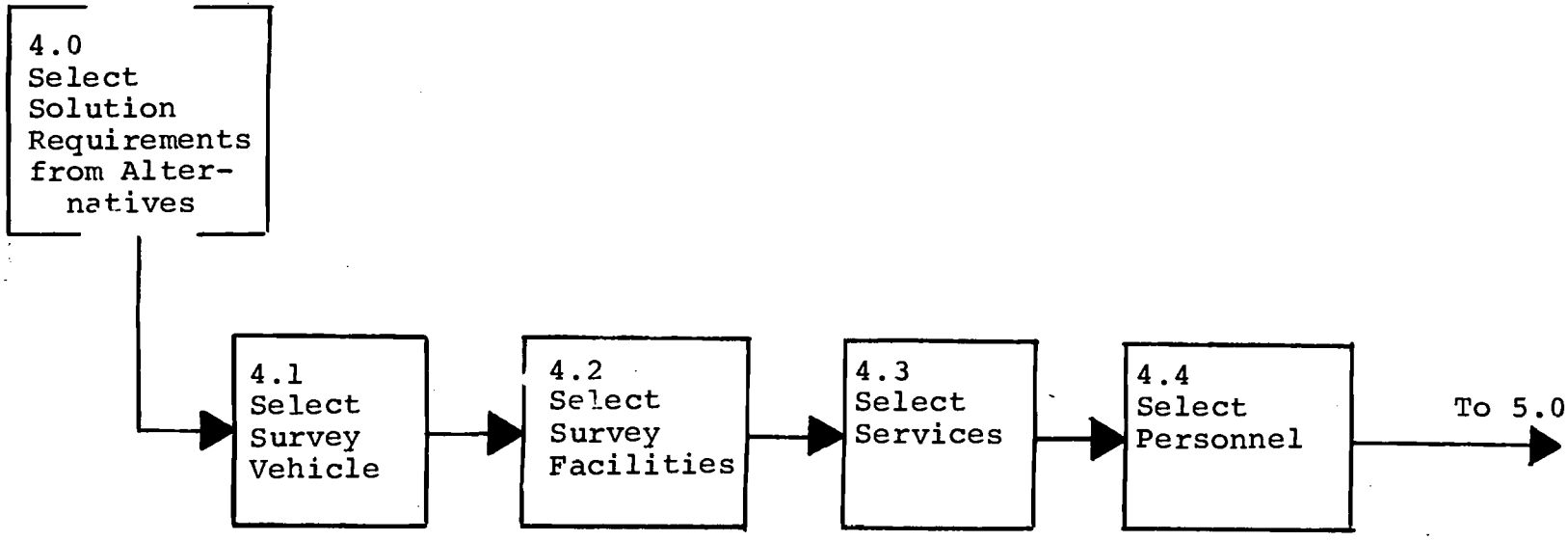
4. The plan will include the methods to be employed in each phase of activity and will list parties charged with the responsibilities for completing tasks. VE director and other required participants will monitor each phase and provide the list of parties charged with completing tasks. The names of required participants will be provided by the VE director.

ERIC

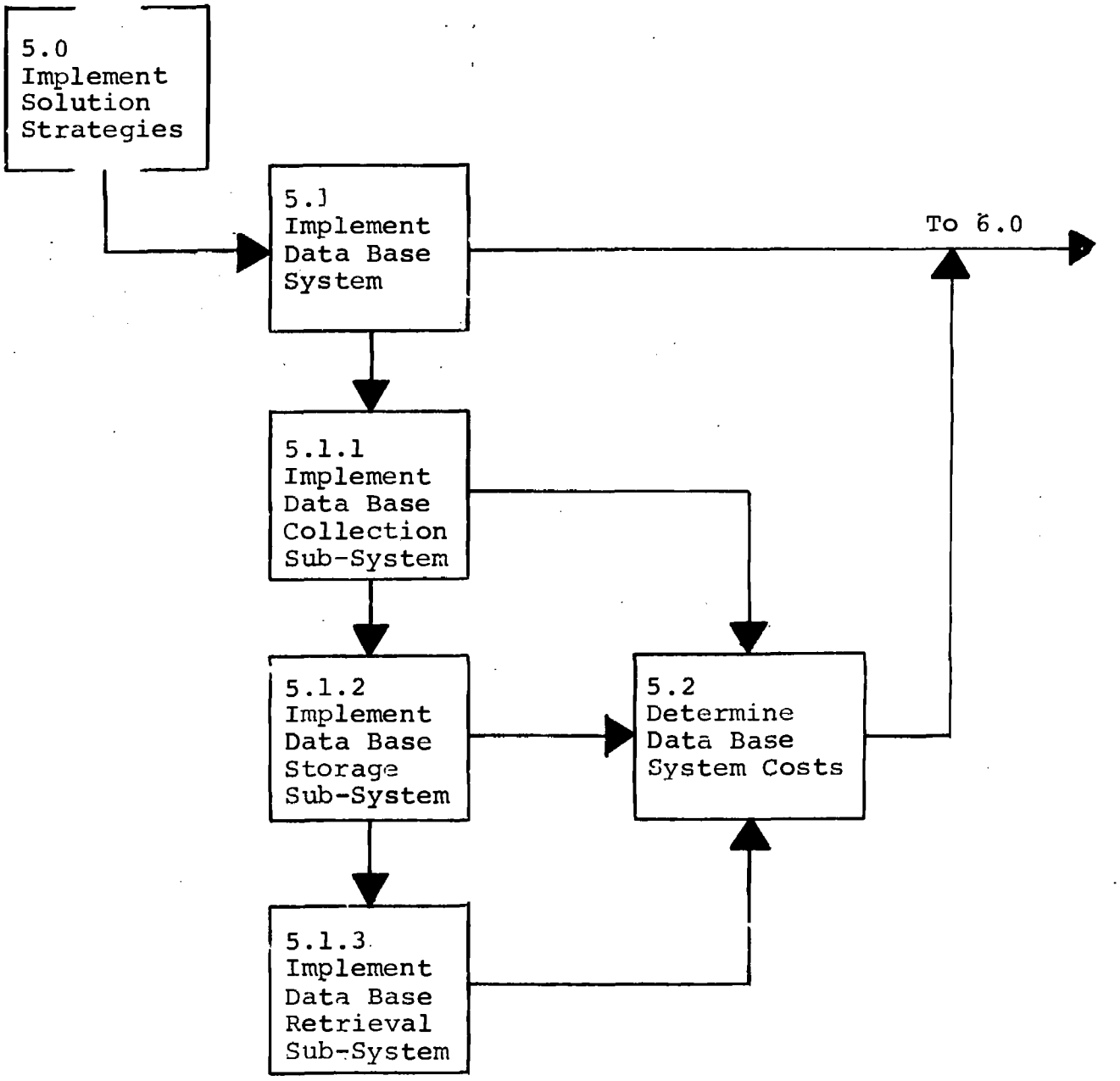

MISSION PROFILE
VEA 45 Reports
0.0 Compile VE 45 Reports
.0 Identify Required Data
1.2 Identify Sources of Data
1.3 Identify Input Capabilities
2.0 Determine Match/Mis-matches
3.0 Determine Solution Requirements and Alter-natives
4.0 Select Solution Requirements from Alter-natives
5.0 Implement Solution Strategies
6.0 Determine Performance Effectiveness
7.0 Revise as Required

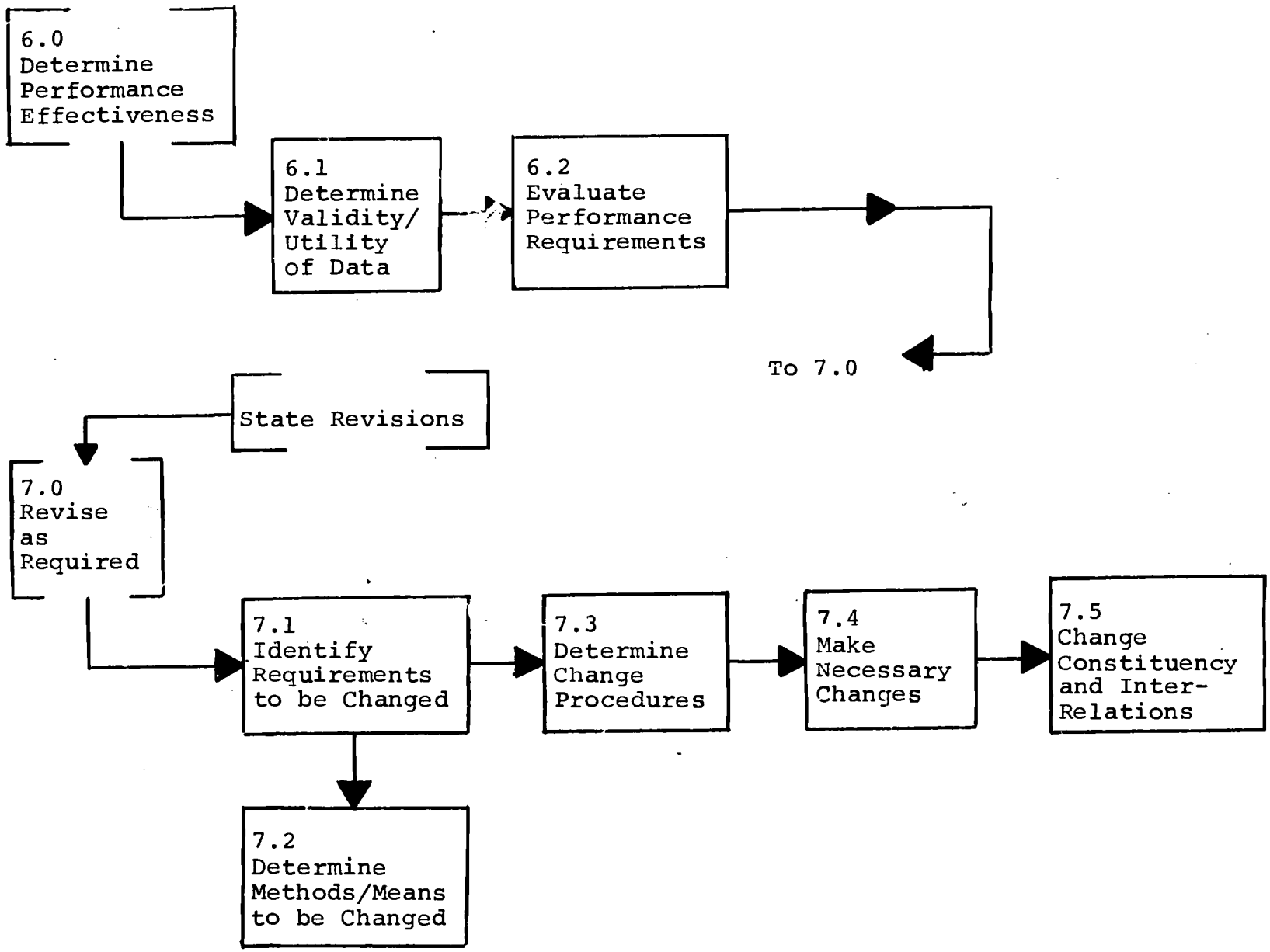

1.0 Identify Required Data
1.1 Determine Report Format Requirements
1.1.1 Determine Completed Program/Left School Requirements
1.1.2 Determine Status Unknown Requirements
1.1.3 Determine In-Armed-Forces Requirements
1.1.4 Determine Continued School Full-Time Requirements
1.1.5 Determine Not in Labor Force /Unemployed Requirements
1.1.6 Determine Employed in Related/Unrelated Occupation Requirements
1.1.7 Determine Employed Part-Time Requirements
1.1.8 Determine Left Before Completion Requirements
1.1.9 Determine Handicapped and Disadvantaged Requirements
1.1.10 Determine Male/Female Requirements
1.2 Identify Sources of Data
1.2.1 Identify Programs
1.2.2 Identify Students
1.2.3 Identify Faculty
1.2.4 Identify Support Services
1.3 Identify Input Capabilities
1.3.1 Identify Existing Documents
1.3.2 Identify Student Records
1.3.3 Identify Survey
2.0 Determine Matches/Mis-Matches


3.0
Determine
Solution
Requirements
and Alter-
natives
3.1
Develop
Data
Collection
Model
To 4.0
3.1.1
List Strategies
and Alternatives
3.1.2
Determine
Performance
Requirements
and Criteria
3.1.3
Determine Possible
Survey Instruments
3.1.4
Determine Possible
Survey Personnel
3.1.5
Determine Data
Processing
Requirements
3.1.6
Determine Data
Processing Costs
3.1.7
Determine
Facilities
Requirements
3.1.8
Determine Time
Requirements


4.0
Select
Solution
Requirements
from Alter-
natives
4.1
Select
Survey
Vehicle
4.2
Select
Survey
Facilities
4.3
Select
Services
4.4
Select
Personnel
To 5.0

ERIC


5.0
Implement
Solution
Strategies
5.1
Implement
Data Base
System
To 6.0
5.1.1
Implement
Data Base
Collection
Sub-System
5.1.2
Implement
Data Base
Storage
Sub-System
5.2
Determine
Data Base
System Costs
5.1.3
Implement
Data Base
Retrieval
Sub-System


6.0
Determine
Performance
Effectiveness
6.1
Determine
Validity/
Utility
of Data
6.2
Evaluate
Performance
Requirements
To 7.0
State Revisions
7.0
Revise
as
Required
7.1
Identify
Requirements
to be Changed
7.3
Determine
Change
Procedures
7.4
Make
Necessary
Changes
7.5
Change
Constituency
and Inter-
Relations
7.2
Determine
Methods/Means
to be Changed

Punch Card Layout for
Information Required to Develop State
of California Reports VE-45 and VE-48

Card Type: IBM, 80 Column

Information Item	Columns Required	Instructions	Information Source
Social Security Number	9		Registration
Name	15	Last name, space, first name, space, middle initial (no periods, truncate first name if necessary)	
Address	15	Number and street (no spaces between)	Registration
City	7	Abbreviate or truncate if necessary (delete spaces)	Registration
ZIP Code	5		Registration
Telephone Number	7	Do not include area code	Registration
Sex Code	1	1=Male 2=Female	Registration
Ethnic Code	1	1=Spanish Surname, 2=Other White, 3=Negro, 4=Chinese, Japanese, Korean, 5=American Indian, 6=Other Non-White	Observation at Registration
Program Code	8	Vocational-Technical Education Program Codes (OE 80061 a USOE publication)	Registration
Units Completed	4		Records
Units Enrolled	3		Records
Student Status Code	1	Regular day, part time, extended day, etc. (Definitions required)	Records
Adult Status Code	1	Definitions required	Records
Constraint Code	1	1=Disadvantaged, 2=Handicapped (Terms require definition)	Records
Graduate Status Code	1	1=Degree or certificate, 2=Other Requires clarification	Records
Employment Status Code	1	1=Unknown, 2=Armed forces, 3=Continued full time school, 4=Not seeking employment, 5=In occupation full time, 6=Related occupation full time, 7=Unrelated occupation full time, 8=Employed part time, 9=Unemployed, seeking work	Interview

PROCESSING WORK SHEET (VE45-48)

ACTIVITY	RESPONSIBILITY	DATE	COMMENTS
1. Social Security #			
2. Name			
3. Street			
4. City			
5. Zip			
6. Telephone			
7. Sex			
8. Ethnic			
9. Program			
10. Units Completed			
11. Units Enrolled			
12. Enrollment Status			
13. Adult: Program Type			
14. Handicap/Disadvantage			
15. Graduation Status			
16. Employment Status			

MISSION PROFILE

for

DEVELOPMENT OF A MODEL TO IDENTIFY AND ASSESS NEEDS

FOR ADULT SKILL CENTER FACILITIES

by

Dick Hamann

MISSION OBJECTIVE

Within one year after project approval, a needs assessment model will be developed that will identify the steps and procedures to be followed in ascertaining whether the Adult Division Vocational Education Program of the San Diego Community College District should be expanded from a single location skill center to more than one location. The model will identify the additional locations and programs to be offered at these locations within the San Diego Community College District boundaries if the requirement exists, and will provide for phase-in and phase-out of locations as need changes. The model will take into consideration geographic locations, industry needs, ethnic and cultural concentrations and assessability factors including transportation and facilities availability.

PERFORMANCE REQUIREMENTS

1. Needs assessment model will be acceptable to the community and industry of San Diego as measured by approval of appropriate community advisory committees.

2. The model will be acceptable to the San Diego Community College District as measured by approval of the Adult Division Council and the Vocational Education Council.

3. The model will graphically display the locations, the size, and program offerings of additional skill skill centers (if required) and/or programs required at any or all locations such that there will be less than 5% of classes which do not "make" and no more than 5% of requests for courses which are not offered.

4. The model will be designed to provide a diversified vocational education program to the adult division students involving short term entry level courses. (See specifications for performance requirements #3.)

5. The model will define cost limitations and be designed within these restraints so that expenses will not exceed budget for any year.

6. The model will meet the needs of vocational education training for minority and disadvantaged adults in San Diego as indicated by the criteria for performance requirements #3.

Performance Requirements (continued)

7. The model will be developed by a principle investigator hired specifically to meet the objectives of this proposal.

8. The model will incorporate statistical data available from the San Diego Adult Division, the Unified District and service agencies such as HRD and CAM' S.

9. The model will identify and support with empirical data, the following:

   A. Current and projected learner loads (1 - 10 years).

   B. Current and projected Vocational Education employment requirements for 1 - 10 years.

   C. Extent to which current resources and facilities can or cannot handle current and projected requirements.

   D. Options to meet current and anticipated needs along with estimated costs and benefits.

   E. Recommendations for the selection of options with anticipated costs and benefits.

10. All aspects of the model will be approved for management by the Vice-President for Academic Affairs and for fiscal aspects by the Vice-President for Business.

Determination of location expansion is predicated upon validly identified needs which evidence such factors as: industry shifts (geographically) and production increases/decreases; physical plant requirements and availability (consideration should be given not only to classroom size -- instructional and equipment housing -- but also to other items such as parking, snack shop, instructor offices, lighting, ventilation, and storage).

In addition to the above, factors such as administrative overhead, insurance, security, plant maintenance, and the attitudes and philosophy of board members, instructors and administrators at the proposed site should be considered. It should be noted that student cost factors also should be investigated to determine an optimization plan (i.e., to correlate learner costs with resource requirements).

Another relevant variable to be considered is that of equipment duplication. This also should be based on "required to have" rather than "nice to have." Therefore, criteria for assessment and rating should be clearly established and applied subsequent to tentative site selection but prior to equipment purchase. Ensuing trade-offs between site selection and program (total) costs are expected and necessary to achieve a functionally operable and responsive (to learner, community colleges, and industry) program.

The model should be sensitive to continuous "up-grading" based upon location shifts and/or additions, site phase-in and phase-out plans should be incorporated as a sub-system. Transportability of equipment to new sites for either consolidation or for "closing down" of a site are additional considerations. Important also is the "down-time" of equipment. This is in terms of both non-use as well as in terms of it being serviced/repaired. These may become highly relevant variables relative to real cost versus "purchase price" cost.

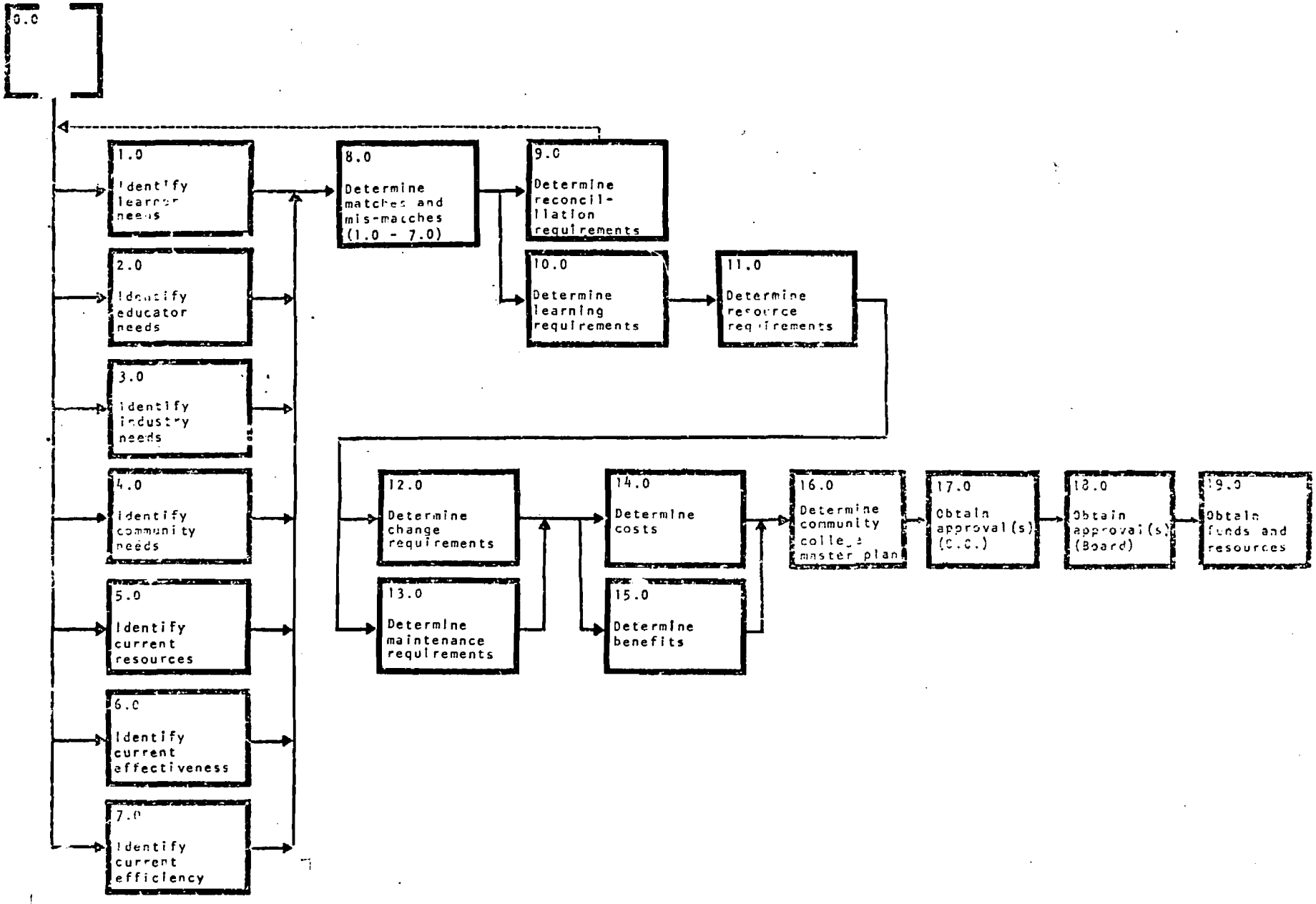
ADULT DIVISION VOCATIONAL EDUCATION PROPOSAL

NEEDS ASSESSMENT

WHAT IS		WHAT SHOULD BE
	STUDENTS	
1. Limited access to Vocational Education Program as indicated by more than 5% of enrolled learners request courses in locations where courses are not offered.		1. Programs located to serve target population as measured by less than 5% asking for courses.
2. Limited programs offered. (More than 5% of enrolled learners request courses not offered.)		2. Program should meet needs of community and industry as measured by an increase in graduate employment by 10% each year for 5 years.
3. Lack of awareness of program offered as indicated by (50)% of random sample in Community College District did not know of Vocational Education programs.		3. Provide more effective publicity so that less than 5% indicate lack of knowledge about the program.
	EDUCATORS	
1. Unable to accurately identify and define future Vocational Education requirements as indicated by number of behavioral objectives for present and future courses.		1. System with community/industry/education inputs to define future requirements as indicated by unemployment reducing 8% per year.
2. Lack of knowledge of present adult schools facilities, capabilities, or programs as measured by (25)% of sample contacted could not name more than 5 programs and location and learner outcomes.		2. Provide data to present current capabilities so that return on investment will increase each year.
3. Resources for expanding Adult Vocational Education Program not available as indicated by a refusal of the Board to allocate funds.		3. Obtain appropriate funding so that return on investment will increase each year.
4. Existing personnel unable to devote time for planning due to 100% scheduling of all personnel for instruction and/or administrative duties.		4. Master plan will be (1) accepted by the Board, and (2) will increase return on investment each year.
	COMMUNITY	
1. Not aware of existing program, purpose, goals or effectiveness as indicated by (75)% of community members who were eligible to enroll knew about the program.		When asked. at least 90% of the community will state that they: (a) know about the Vocational Education program; (b) know someone who is attending a Vocational Education program.
2. No effective coordination effort to train citizens in areas where employment requirements are greatest as indicated by a 6.2% unemployment rate.		

WHAT IS	WHAT SHOULD BE
COMMUNITY (con't.)	
3. No effective communication with industry as to requirements for entry level training as indicated by (a) 58 on-site training programs sponsored by Community Colleges out of a possible 390 sites, (b) (40)% of personnel managers did not identify the Community College as a source for finding employees.	If tax increases are required, based upon a formal needs assessment, proper funding will be approved.
4. No means to determine effectiveness of program or evaluating results.	

NOTE: (___)% indicates estimate.


0.0
1.0
Identify learner needs
2.0
Identify educator needs
3.0
Identify industry needs
4.0
Identify community needs
5.0
Identify current resources
6.0
Identify current effectiveness
7.0
Identify current efficiency
8.0
Determine matches and mis-matches (1.0 - 7.0)
9.0
Determine reconcil-liation requirements
10.0
Determine learning requirements
11.0
Determine resource requirements
12.0
Determine change requirements
13.0
Determine maintenance requirements
14.0
Determine costs
15.0
Determine benefits
16.0
Determine community college master plan
17.0
Obtain approval(s) (C.C.)
18.0
Obtain approval(s) (Board)
19.0
Obtain funds and resources

MISSION PROFILE

for

A MODEL FOR EVALUATING A CLERICAL CLUSTER OF CLASSES

RELATIVE TO SUCCESS IN JOB PLACEMENT

by

Maxwell C. Gillette

ERIC

MISSION OBJECTIVE

Using the clerical cluster of classes consisting of English, Mathematics, typing, and shorthand, at the end of one semester students will reach the level of competency to enter into entry level clerical positions as measured by San Francisco Civil Service Commission standards. At the end of this training, at least 75% of the trainees will be placed in gainful employment in areas trained or related areas.

PERFORMANCE REQUIREMENTS

1. Each clerical cluster group will be of one semester (89) days in duration.

2. Each student will be enrolled in typing, English, Mathematics, and shorthand for a period of two (2) hours each day.

3. Classes will be limited to 20 students each.

4. Enrollees will be referred to the program through H.R.D., Department of Social Welfare, Florence Crittington Home, and other participating agencies.

5. Each student must have a minimal education level of 8th grade as measured by the California Achievement Test.

6. H.R.D. will have the responsibility of placing successful graduates into occupational positions commensurate within guidelines of the above stated objectives.

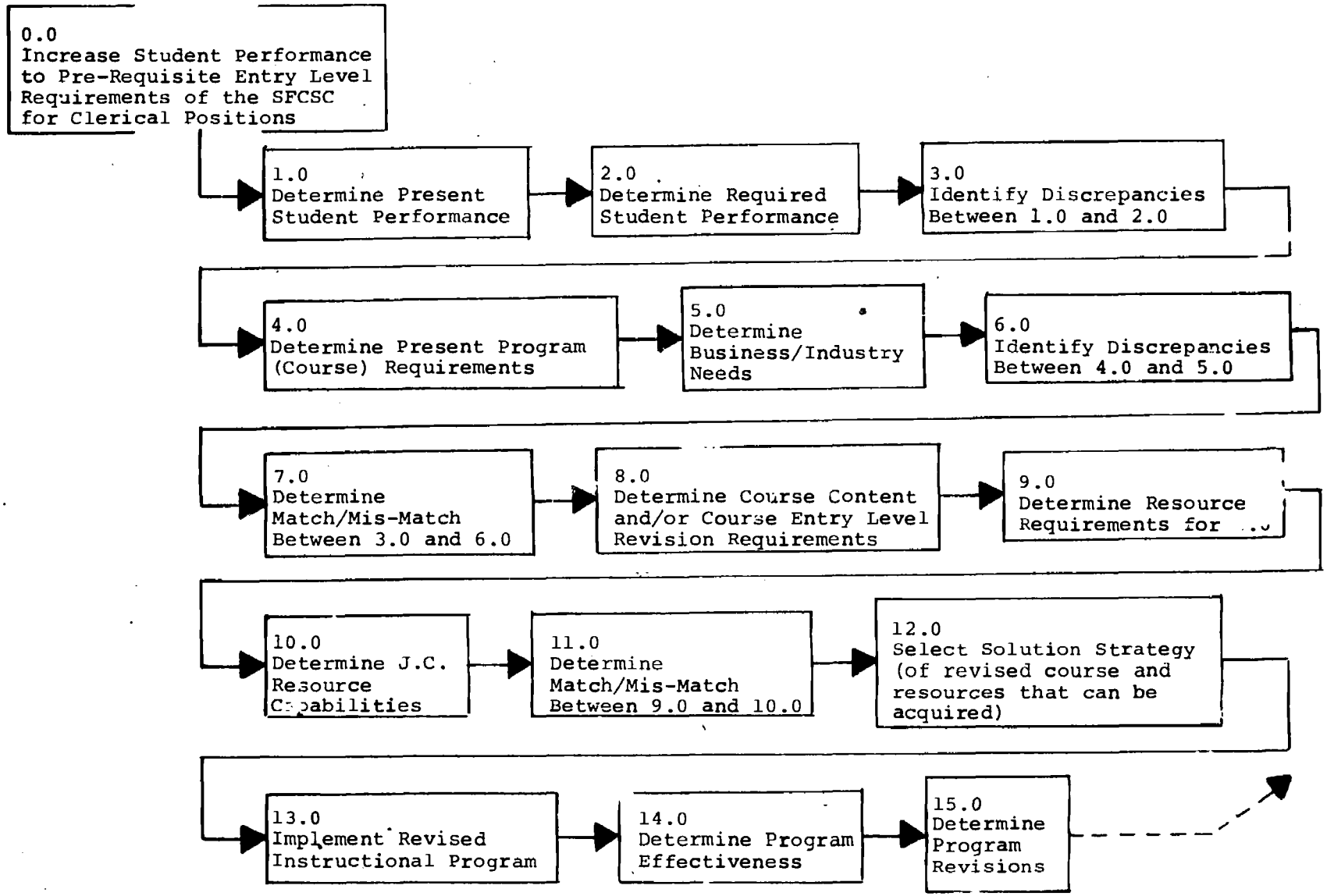


Figure 1. Mission Profile for a Project to Increase Student Performance to Prerequisite Entry Level Requirements of the SFCSC for Clerical Positions

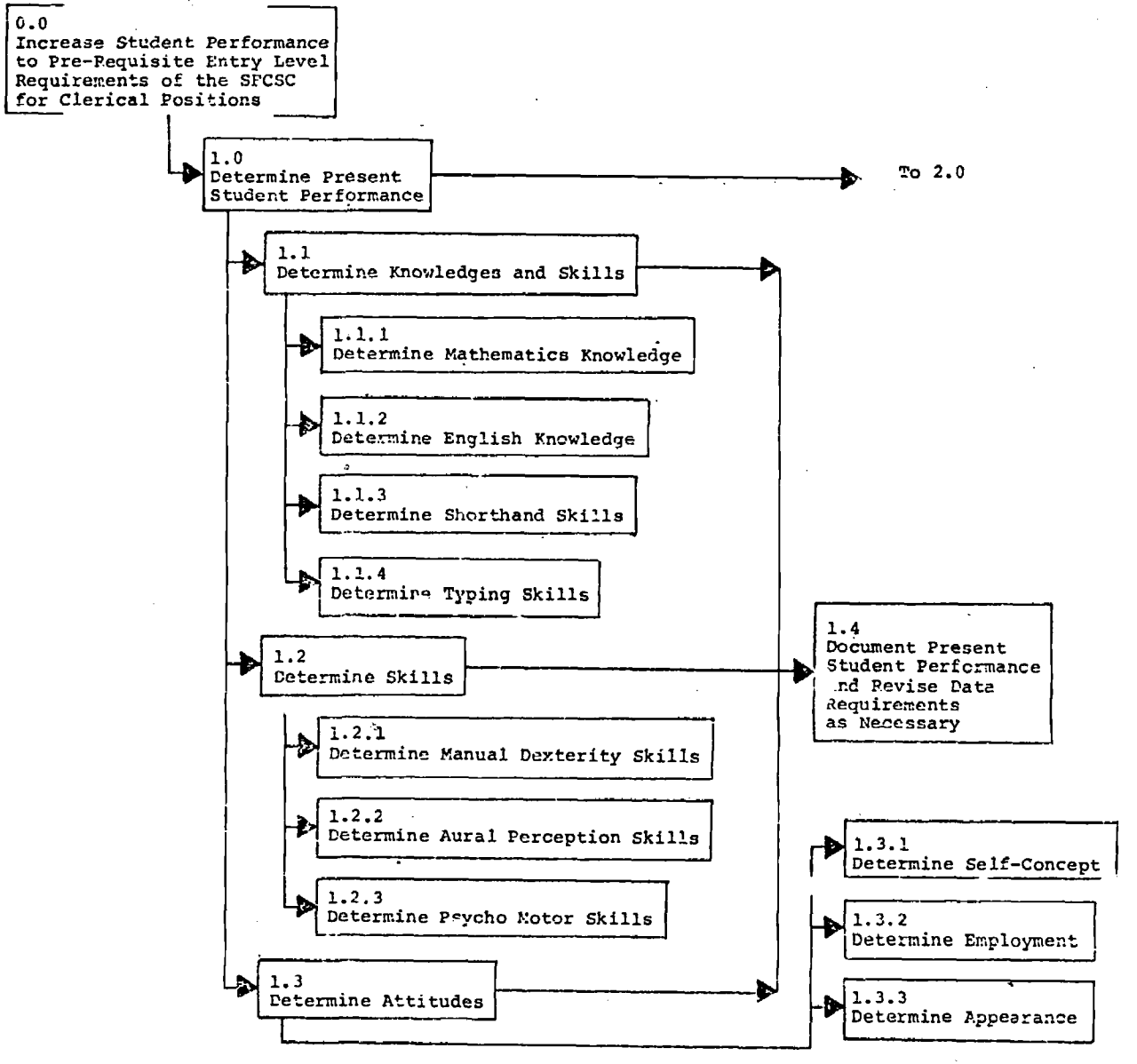


Figure 2. Functions to Determine Present Student Performance

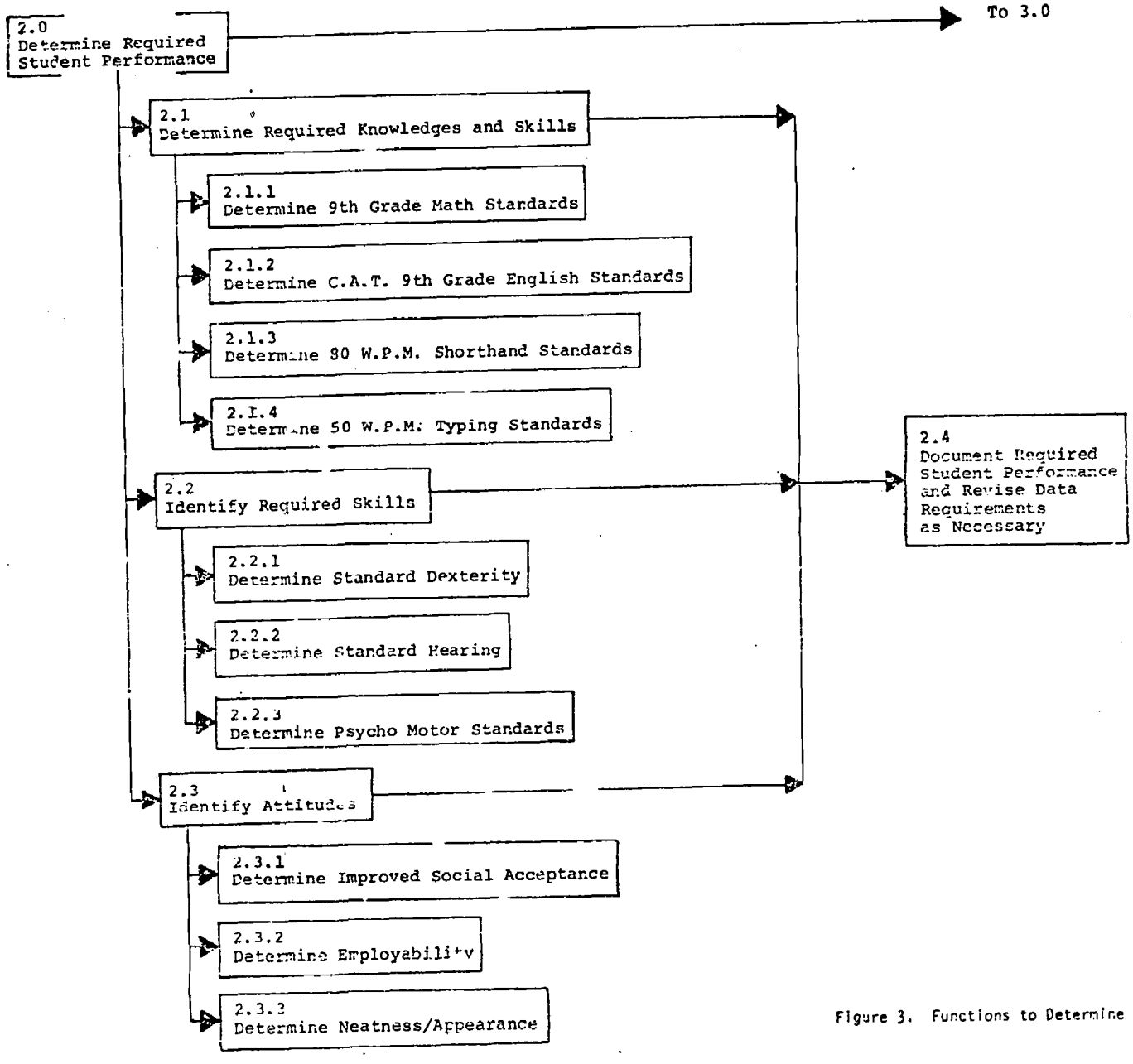


Figure 3. Functions to Determine Required Student Performance

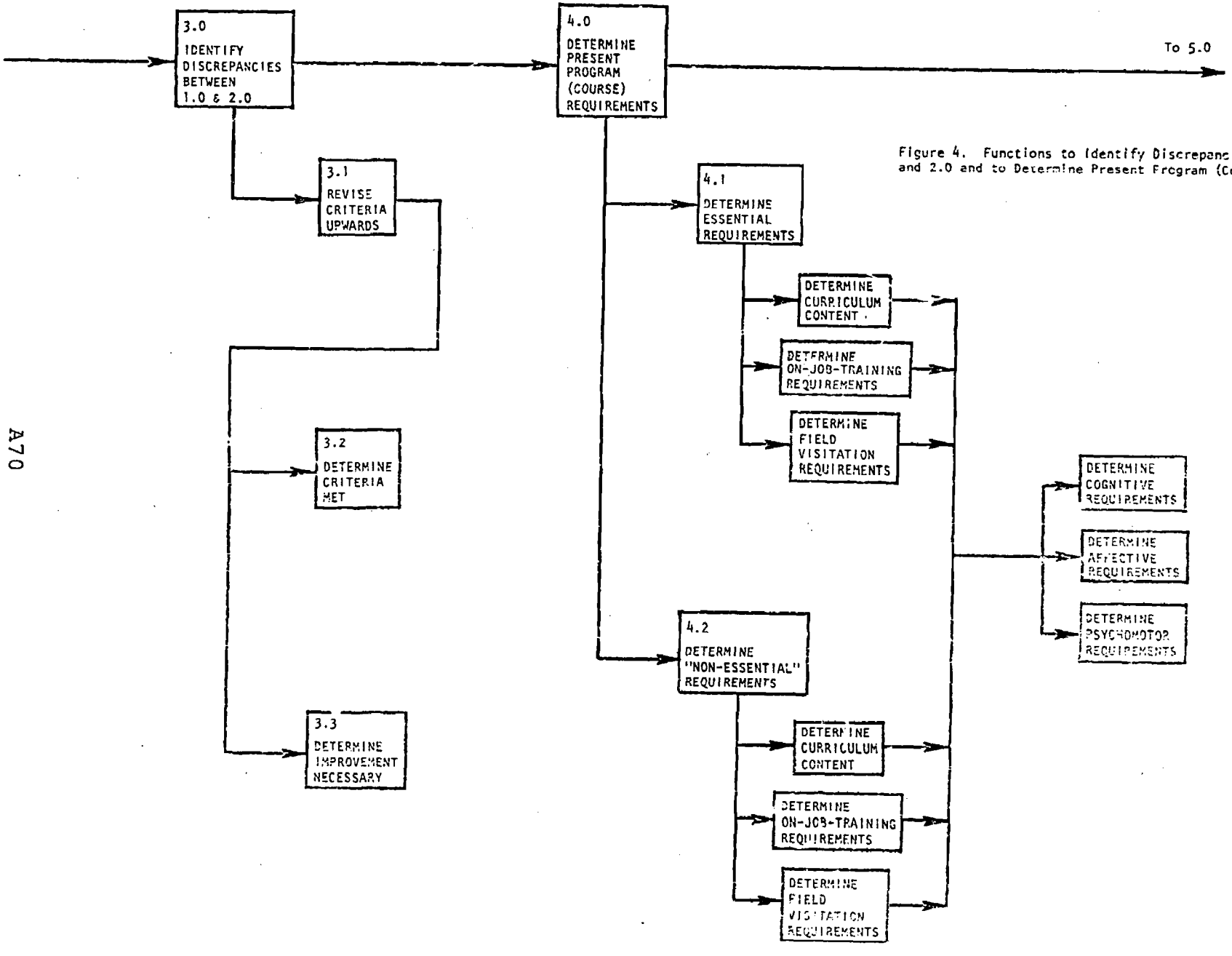


Figure 4. Functions to Identify Discrepancies Between 1.0 and 2.0 and to Determine Present Program (Course) Requirements

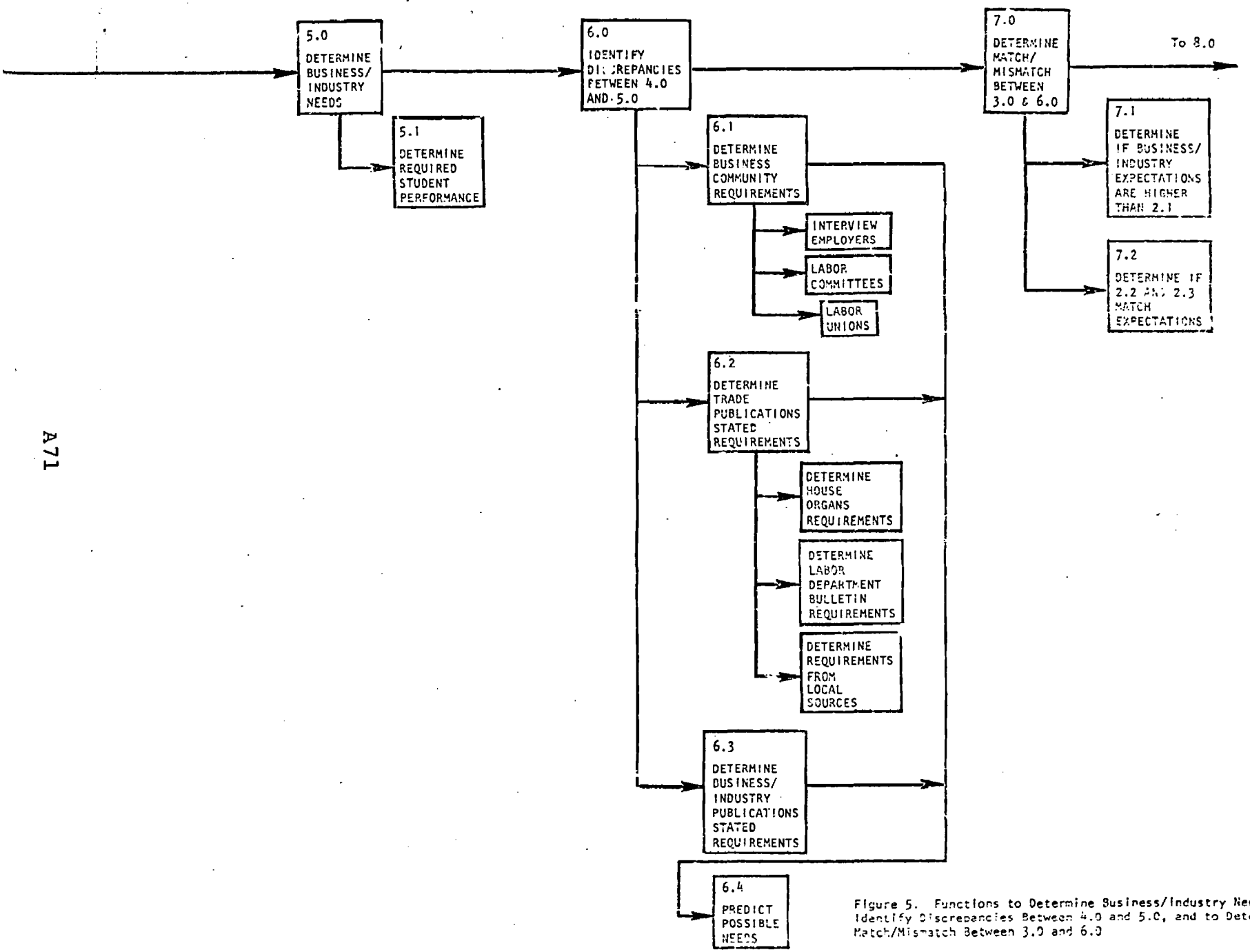


Figure 5. Functions to Determine Business/Industry Needs, to Identify Discrepancies Between 4.0 and 5.0, and to Determine Match/Mismatch Between 3.0 and 6.0

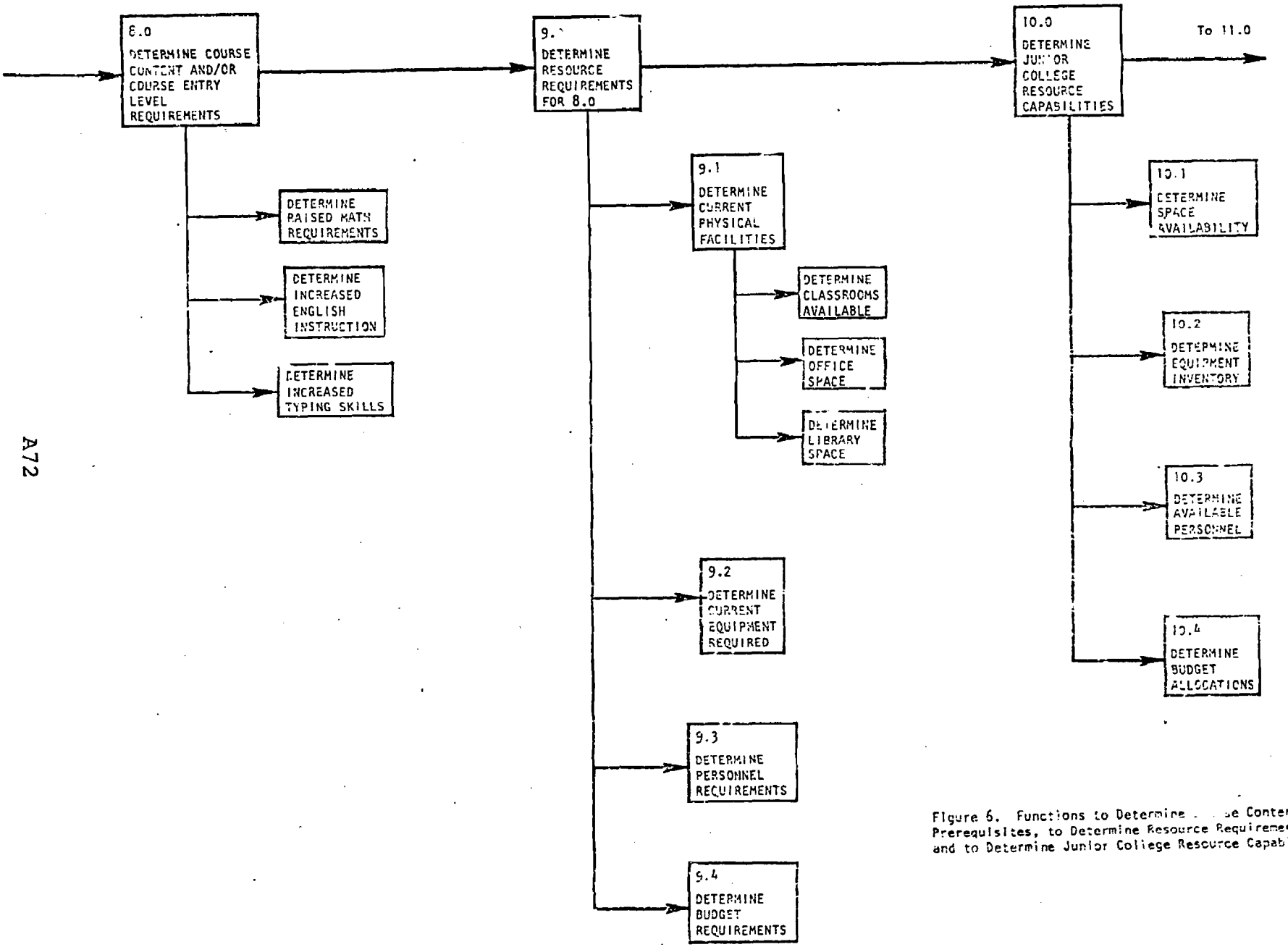


Figure 6. Functions to Determine . . se Content and Prerequisites, to Determine Resource Requirements for 8.0, and to Determine Junior College Resource Capabilities

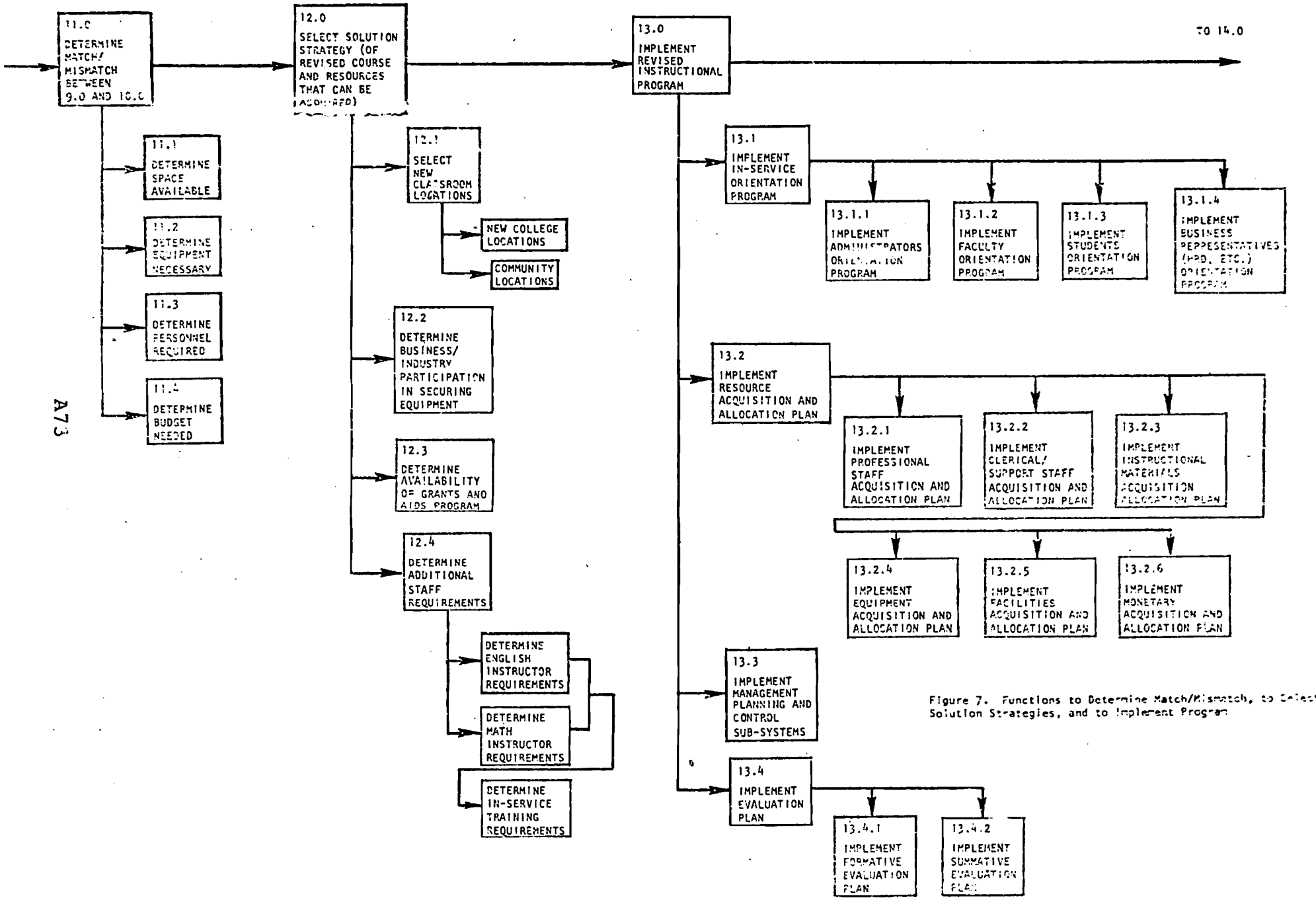


Figure 7. Functions to Determine Match/Mismatch, to Select Solution Strategies, and to Implement Program

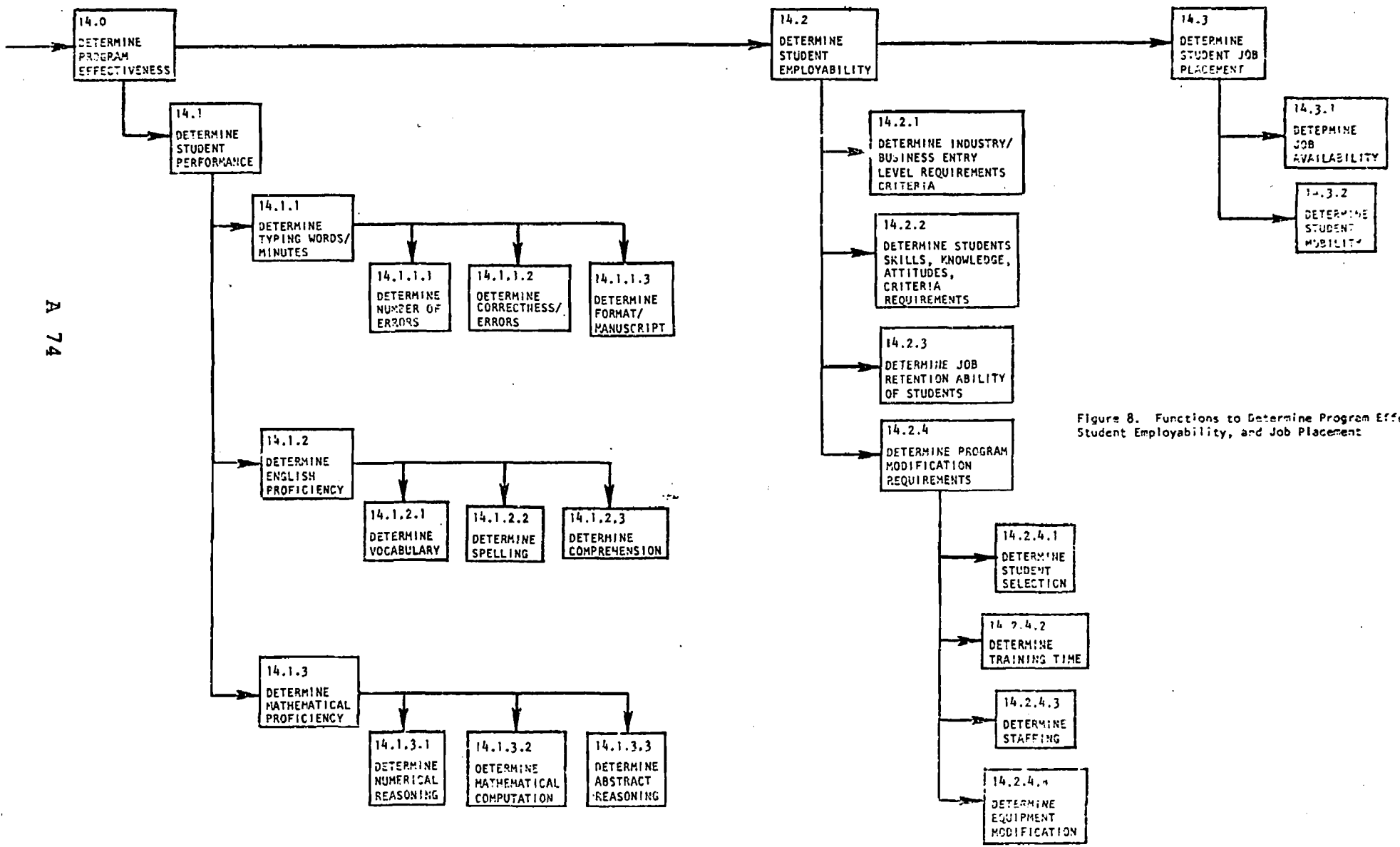
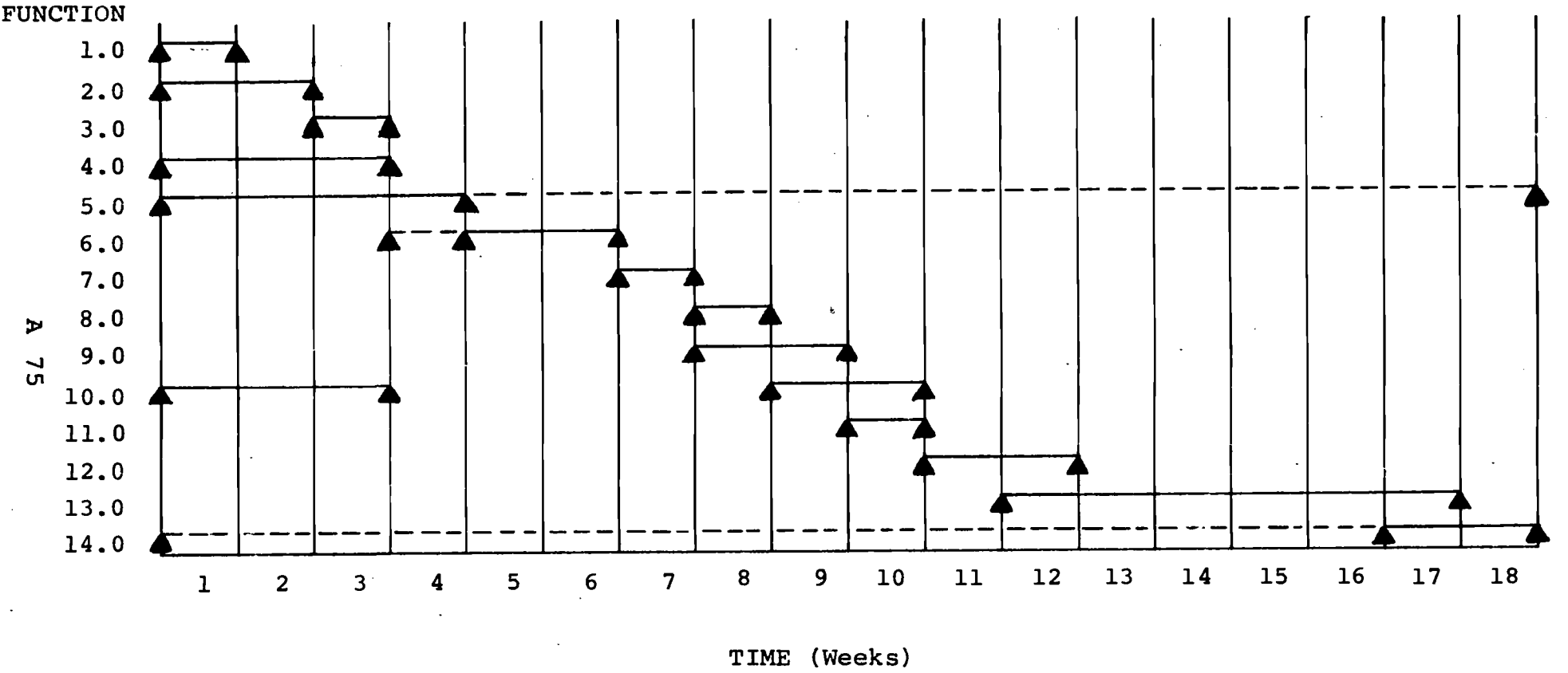


Figure 8. Functions to Determine Program Effectiveness, Student Employability, and Job Placement



A 75

Figure 9. Performance Schedule for Major Functions

MISSION PROFILE

for

DEVELOPMENT OF A PLAN TO PRODUCE EMPLOYMENT

SUCCESS AMONG VOCATIONAL STUDENTS

by

Dan Callahan

A 76/A 77

MISSION OBJECTIVE

By June 2, 1972, develop a plan for the San Francisco Community College Skills Center which (a) will be approved by HRD, State Vocational Education (DOL and HEW), and a majority of the staff (at least 50%), and (b) when implemented, will produce a student success rate in all vocational education programs at the Center of at least 70% obtaining and holding jobs; this percentage of students will complete the program performance requirements and will graduate within one year from the time initially enrolled.

PERFORMANCE REQUIREMENTS

1. Any student who attends at least five class sessions (and is available to be placed at the end of the program) is to be used in computing the success rate.

2. Students will have achievement level necessary to master the given vocational training area as certified by the C.A.T./S.A.T.

3. Students not having the required achievement level will be brought to a level necessary to enter a vocational course.

4. A student is considered to have completed a vocational education program when he has received a certificate of completion.

5. The program will be acceptable to 51% or more of the:

   (a) educators working at the Skills Center during the 1971-72 fiscal year,
   (b) the 1971-72 student advisory committee at the Skills Center,
   (c) the 1971-72 Skills Center advisory committee

   as measured by a locally developed evaluation instrument.

6. A vocational education program is a sequence of courses leading to a certificate of completion as specified in the Skills Center MT-1 and MT-2.

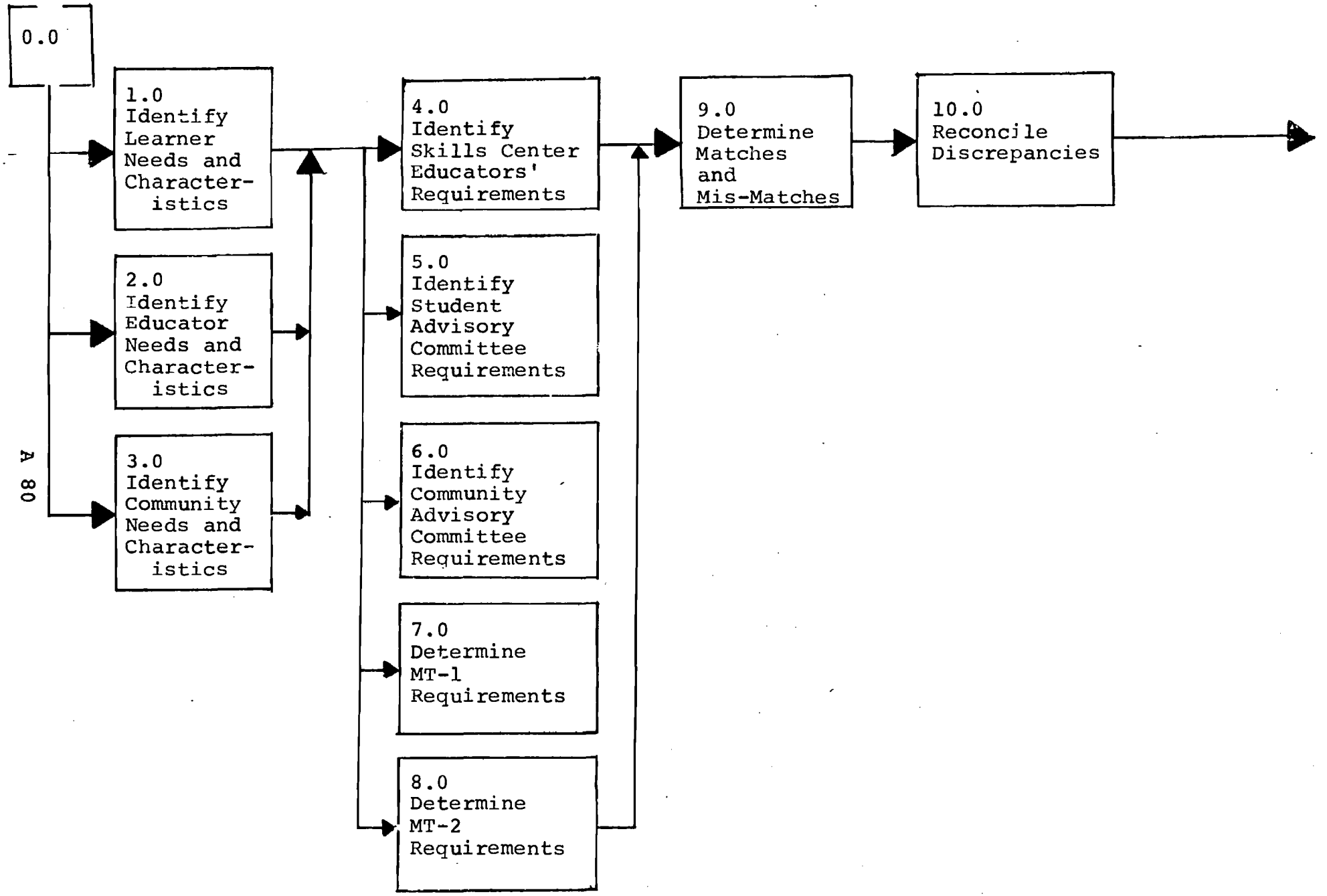
7. At least 70% of those students who complete any vocational education program will secure jobs within six months, and hold them for six or more months in the field in which they were trained or in a related field as outlined in the Dictionary of Occupational Titles. These jobs will be secured before completion of training by the learner or the HRD Job Agent.

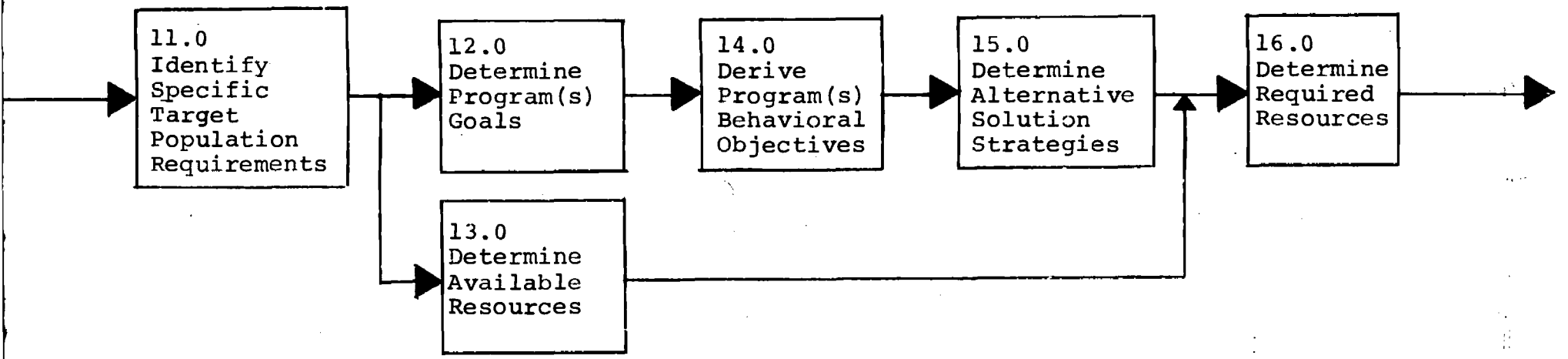
8. All programs will be based upon needs of learners, educators and community; need is defined as measurable discrepancy between "what is" and "what is required."

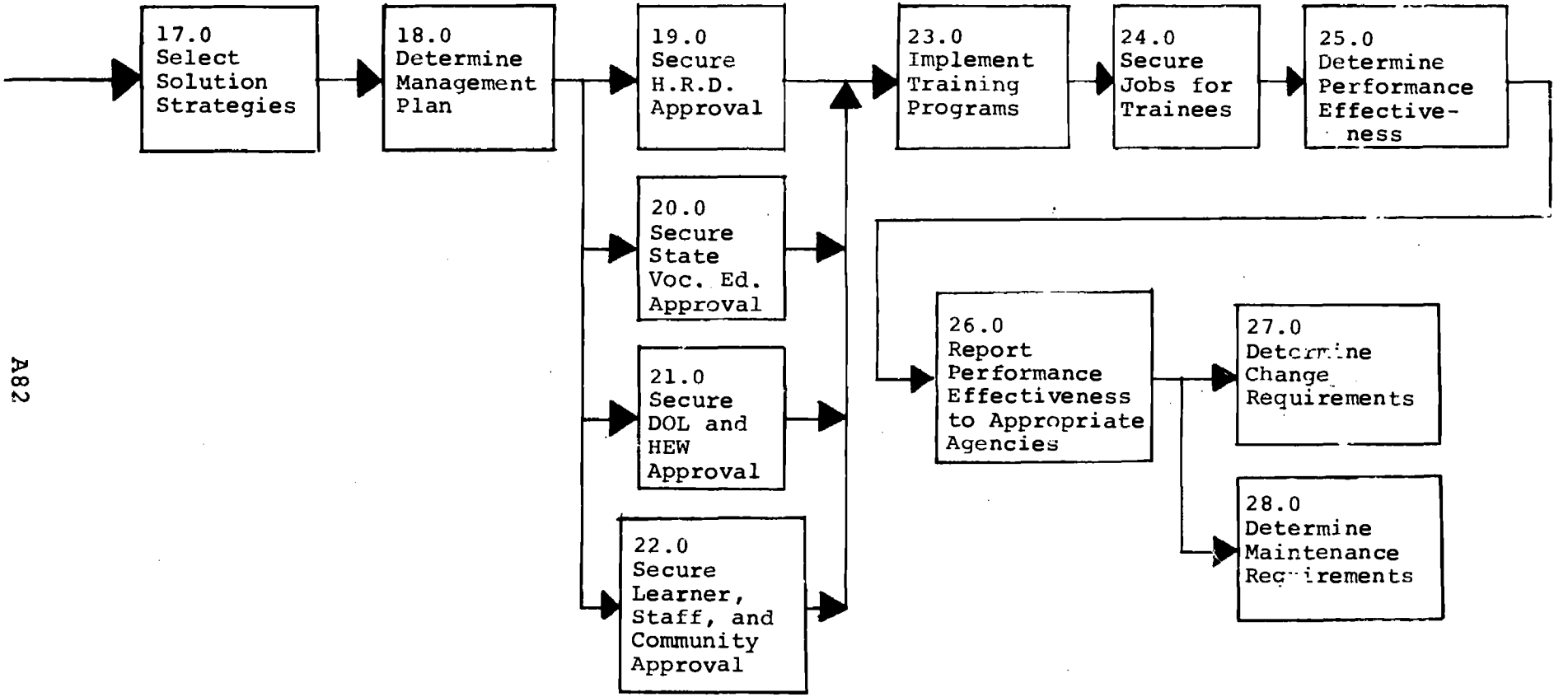
9. Every program will have behavioral objectives specifying the required learner outcomes.

10. Selected learners, educators, and community members will participate in developing the required plans (participation requirements to be specified later).

11. The developed plans will be approved by at least 50% of the learners, educators and community (approval criteria and plan to be developed).


0.0
1.0 Identify Learner Needs and Character-istics
2.0 Identify Educator Needs and Character-istics
3.0 Identify Community Needs and Character-istics
4.0 Identify Skills Center Educators' Requirements
5.0 Identify Student Advisory Committee Requirements
6.0 Identify Community Advisory Committee Requirements
7.0 Determine MT-1 Requirements
8.0 Determine MT-2 Requirements
9.0 Determine Matches and Mis-Matches
10.0 Reconcile Discrepancies


11.0
Identify
Specific
Target
Population
Requirements
12.0
Determine
Program(s)
Goals
13.0
Determine
Available
Resources
14.0
Derive
Program(s)
Behavioral
Objectives
15.0
Determine
Alternative
Solution
Strategies
16.0
Determine
Required
Resources


17.0 Select Solution Strategies
18.0 Determine Management Plan
19.0 Secure H.R.D. Approval
20.0 Secure State Voc. Ed. Approval
21.0 Secure DOL and HEW Approval
22.0 Secure Learner, Staff, and Community Approval
23.0 Implement Training Programs
24.0 Secure Jobs for Trainees
25.0 Determine Performance Effective-ness
26.0 Report Performance Effectiveness to Appropriate Agencies
27.0 Determine Change Requirements
28.0 Determine Maintenance Requirements

MISSION PROFILE

for

DEVELOPMENT OF A PLAN FOR TRAINING

BIO-MEDICAL EQUIPMENT TECHNICIANS

by

Roger Beam
Vern Spaulding

MISSION OBJECTIVE

The Director of Occupational Education at _____ Community College, working with selected personnel including students, educators and community, will develop a plan for training Bio-Medical Equipment Technicians by June 1, 1972. When implemented, the plan will produce trained technicians; at least 90% of the program graduates will secure employment as BMET's within six months of graduation. Of those graduates securing employment, at least 90% will receive satisfactory performance reports from their immediate supervisors in a follow-up study conducted one year after graduation by college representatives.

PERFORMANCE REQUIREMENTS

1. The plan will provide for determining needs of students, educators, and community.

2. The needs of students, educators, and community will be stated in measurable form using ordinal, interval, or ratio measurements.

3. A need is here defined as the measurable discrepancy between "what is" and "what is required."

4. The curriculum with specific course outlines must be completed and approved by curriculum committee, college board, C.C. Chancellor's office by June 1, 1972.

5. Performance objectives will be stated for each unit of work; procedures to achieve those objectives, and criteria by which learner performance will be determined.

6. Using established advisory committee criteria, the class/lab space requirements will be inspected and accepted as adequate prior to program start.

7. The faculty will be employed with hardware and software developed before program start. They must meet college and advisory committee criteria.

8. The class or curriculum pre-enrollment will be screened to insure between 20 and 28 students who meet the selection criteria.

9. Programmed "co-op" schedule will be set with local hospital administration.

10. Student retention into 2nd semester and 2nd year must equal or exceed that of total Vocational-Technical program average.

11. Placement records must validate industry job need and effectiveness of training for job requirements with 90% of all graduates obtaining jobs in BMET (if they apply).

12. The plan will determine the following: a. current and projected future job openings; b. the required student skills, knowledge and attitudes; c. the projected job openings for 5 years including the S.K.A. requirements; d. the number of program participants and their selection criteria; e. the administration requirements including time, personnel, finances, hardware and software, and support services; f. the Board of Education requirements including required Board policy, and g. community leader requirements (as defined by Superintendent and advisory board).

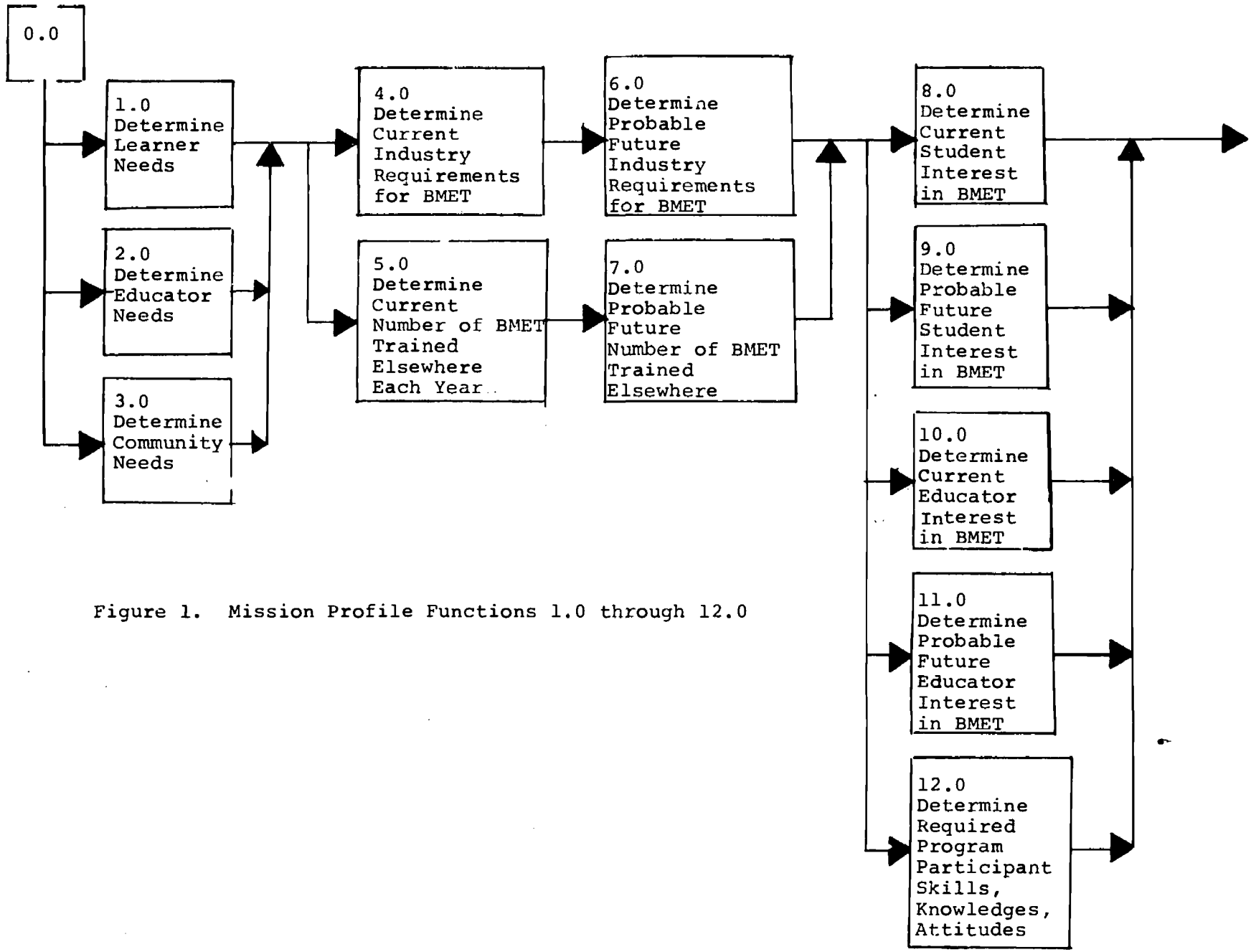


Figure 1. Mission Profile Functions 1.0 through 12.0

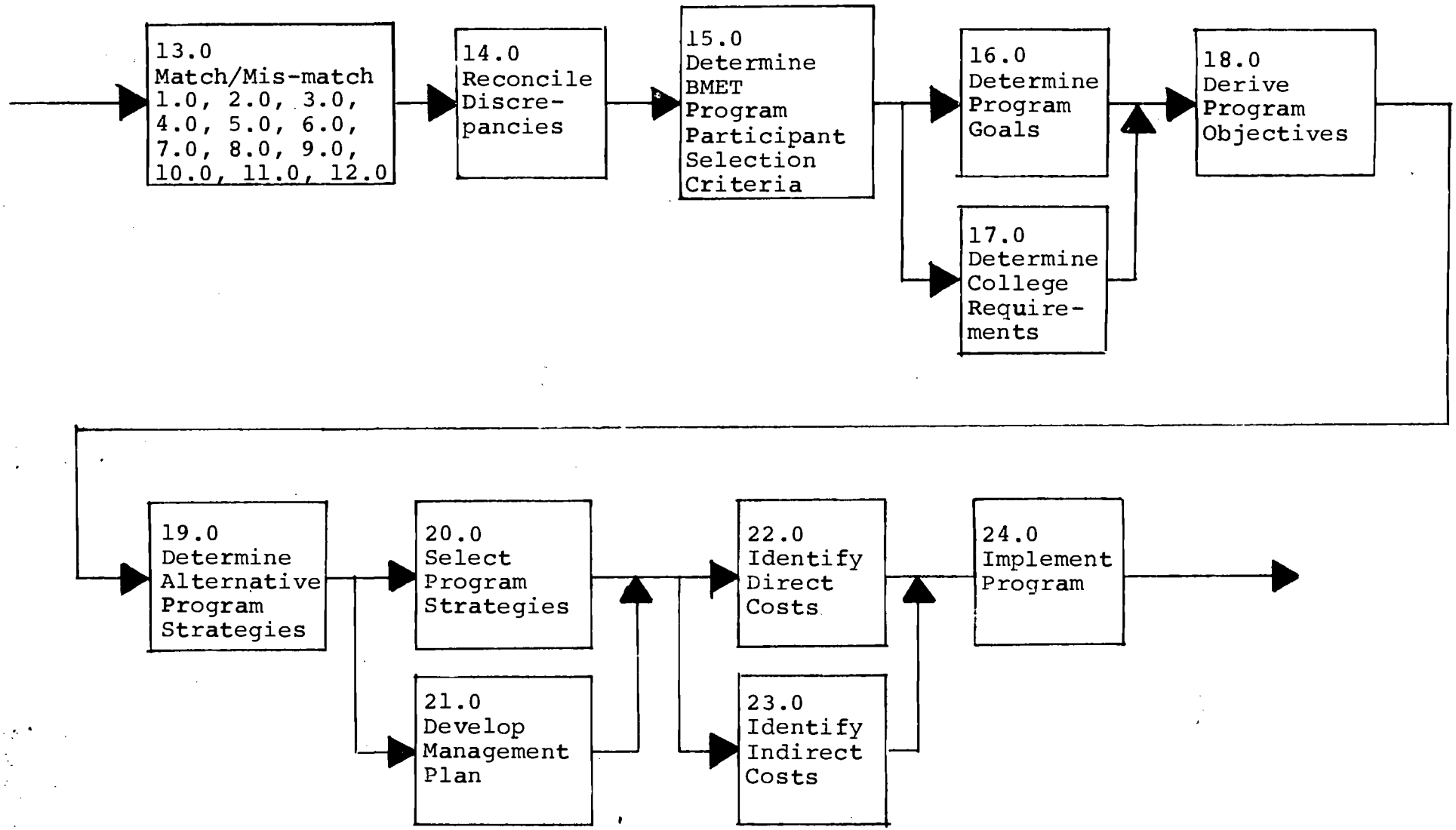


Figure 2. Mission Profile Functions 13.0 through 24.0

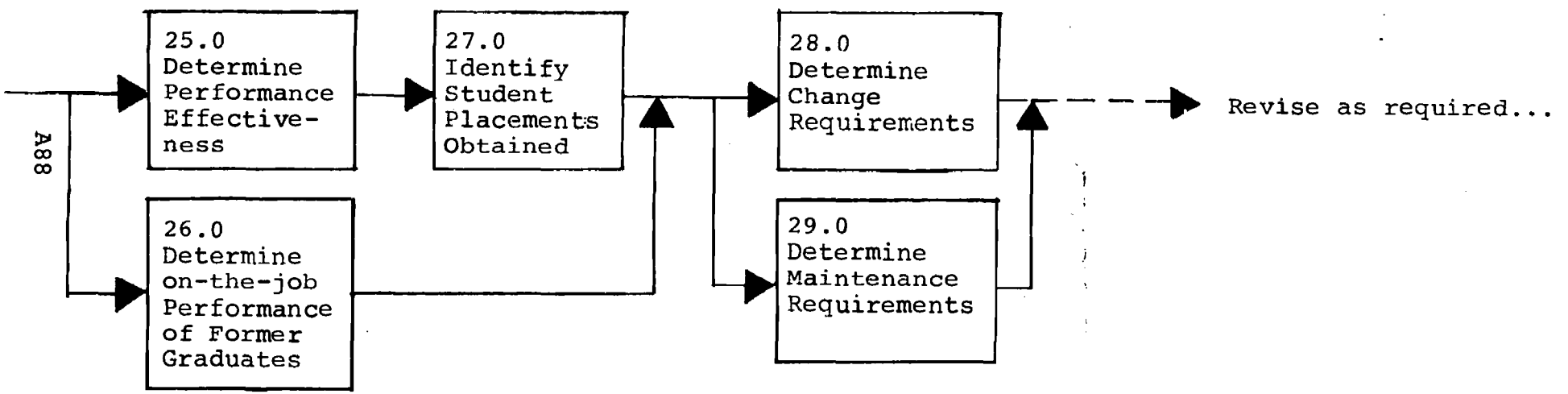


Figure 3. Mission Profile Functions 25.0 through 29.0

2/1/72

KNOWLEDGE ASSESSMENT VEHICLE FOR BIOMEDICAL EQUIPMENT TECHNICIAN "BMET"

Learner Informed	Actual
(○ Initial evaluation, ○ Evaluation after orientation)	(latest available statistics)
The number of persons employed in Los Angeles County as Biomedical Equipment Technicians (BMET) is about _____ ± 10% = 20 pts.	The number of persons employed in Los Angeles County as Biomedical Equipment Technicians (BMET) is about _____
The annual growth rate of this emerging occupation (BMET) is approximately _____% per year. ± 5% of actual % = 20 pts	The annual growth rate of this emerging occupation (BMET) is approximately _____% per year.
What does the "BMET" Technician do on his job: functions and responsibilities: list 5 major typical items 5 items = 5 pts. each	What does the "BMET" Technician do on his job: functions and responsibilities: list 5 major typical items
_____	_____
Required training and/or registration/certification (check one or more likely answers) 6 items = 2 1/2 pts. each	Required training and/or registration/certification (check one or more likely answers)
_____ certificate technical courses necessary	_____ certificate technical courses necessary
_____ AA or AS degree in BMET desirable	_____ AA or AS degree in BMET desirable
_____ Equipment manufacturers special schools for special certification are typical	_____ Equipment manufacturers special schools for special certification are typical
_____ Apprenticeship may be required	_____ Apprenticeship may be required
_____ State registration required	_____ State registration required
_____ High school graduation required for BMET training program entry	_____ High school graduation required for BMET training program entry

Typical monthly pay for a BMET
Initial employment $_____
Well-established Technician $_____

± 10% = 10 pts.ea. (2 items)

Typical monthly pay for a BMET
Initial employment $_____
Well-established Technician $_____

Name or number:_____
Date:_____
Raw Score:_____

MISSION PROFILE

for

DEVELOPMENT OF AREA XII

MASTER PLAN FOR VOCATIONAL EDUCATION

by

John Sharon

MISSION OBJECTIVE

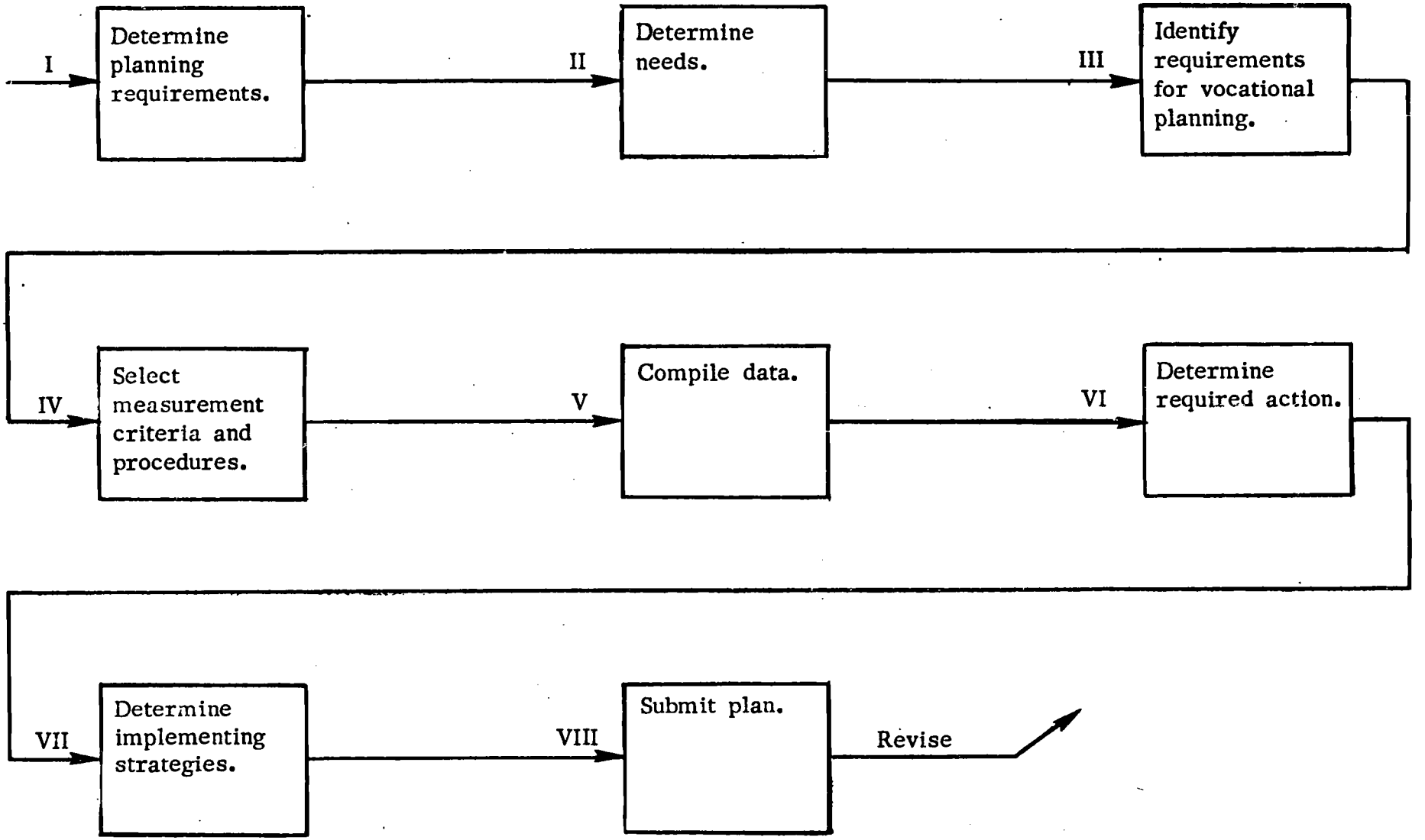
The Area XII Committee will develop and annually revise a Master Plan for Vocational Education as authorized and required in Article 10.4, Section 6268 of the State Educational Code.

Objectives:

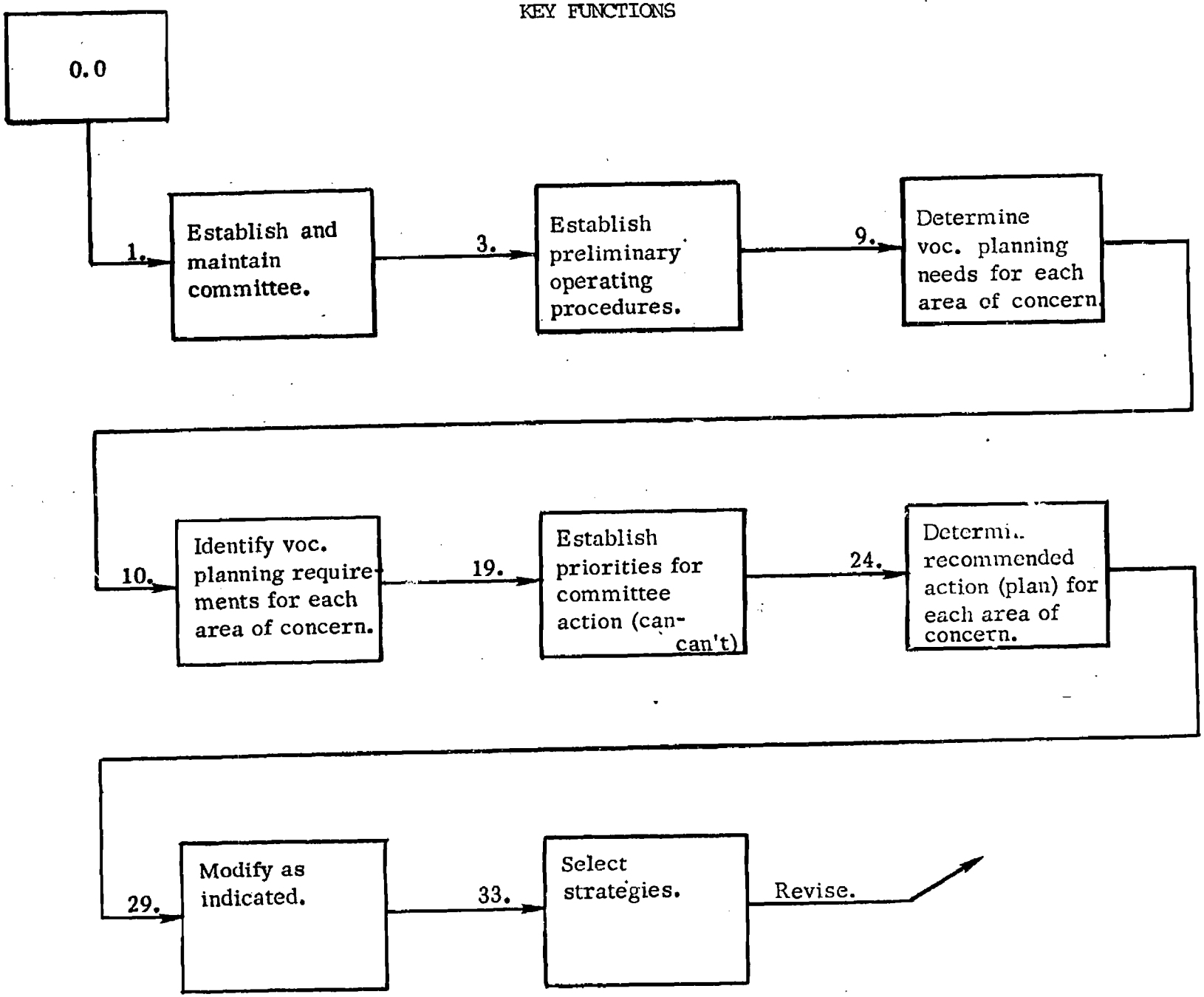
1. Establish and maintain an area plan committee.
2. Determine planning needs for each legislative charge included in Article 10.4, Section 6268.
3. Identify the planning requirements for each legislative charge.
4. Establish priorities for committee action.
5. Develop a plan for each charge of the legislature adapted to the San Diego-Imperial Counties area.
6. Revise this plan annually.

PERFORMANCE REQUIREMENTS

1. The plan will be developed by the committee members working together.
2. The plan will provide measurable components to identify change resulting from the plan.
3. The plan will be reviewed by as many individuals and groups as possible.
4. There will be a sequential process for plan revision.
5. Provision will be made for changing personnel of the committee without loss of continuity.
6. There will be cumulative empirical data developed by the plan.
7. This data will be used for decision making by local districts, County offices, and the State Department and Community Colleges' Board of Governors.
8. The plan will be subject to critical evaluation by the Committee annually.

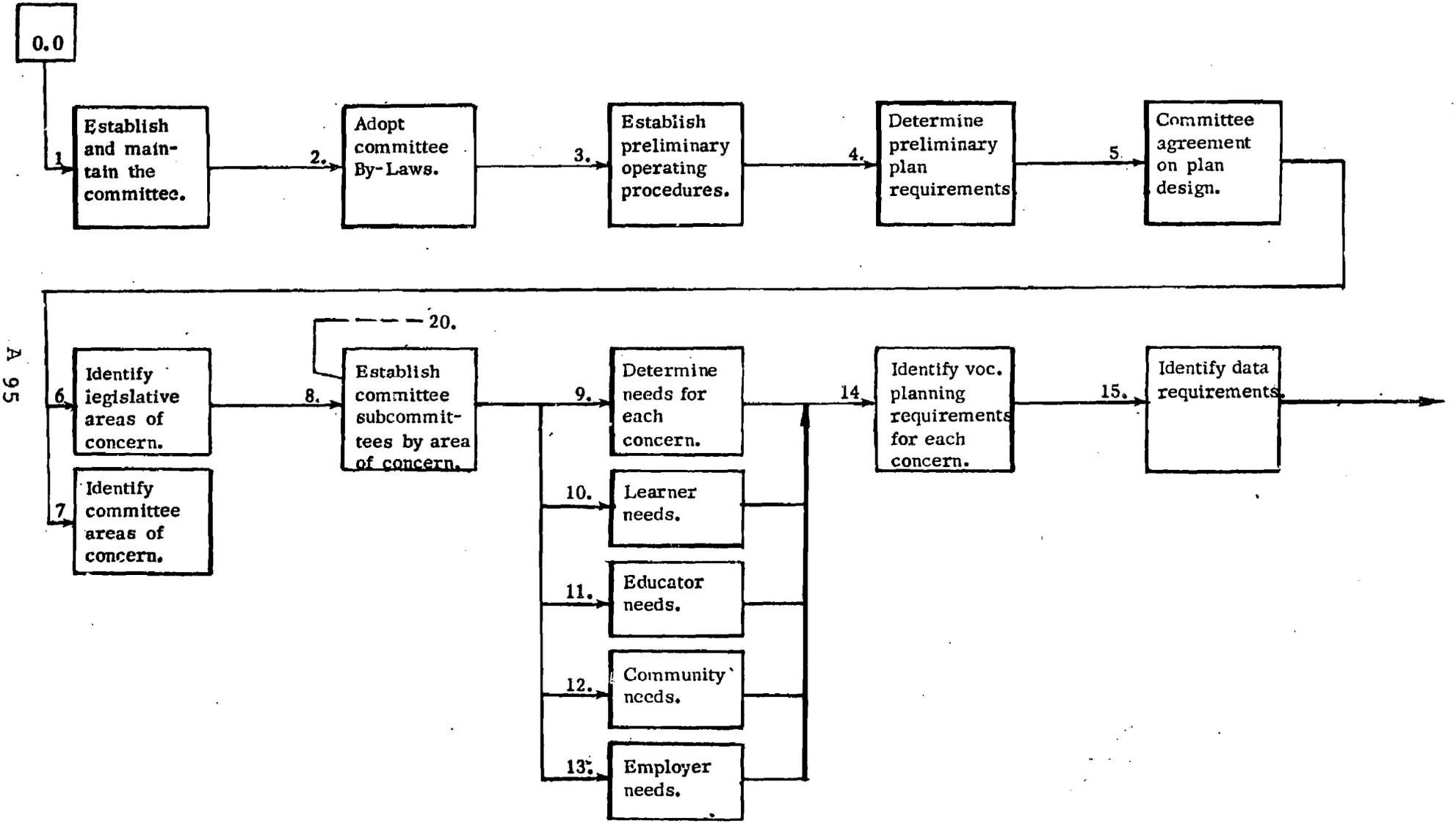

I
Determine planning requirements.
II
Determine needs.
III
Identify requirements for vocational planning.
IV
Select measurement criteria and procedures.
V
Compile data.
VI
Determine required action.
VII
Determine implementing strategies.
VIII
Submit plan.
Revise

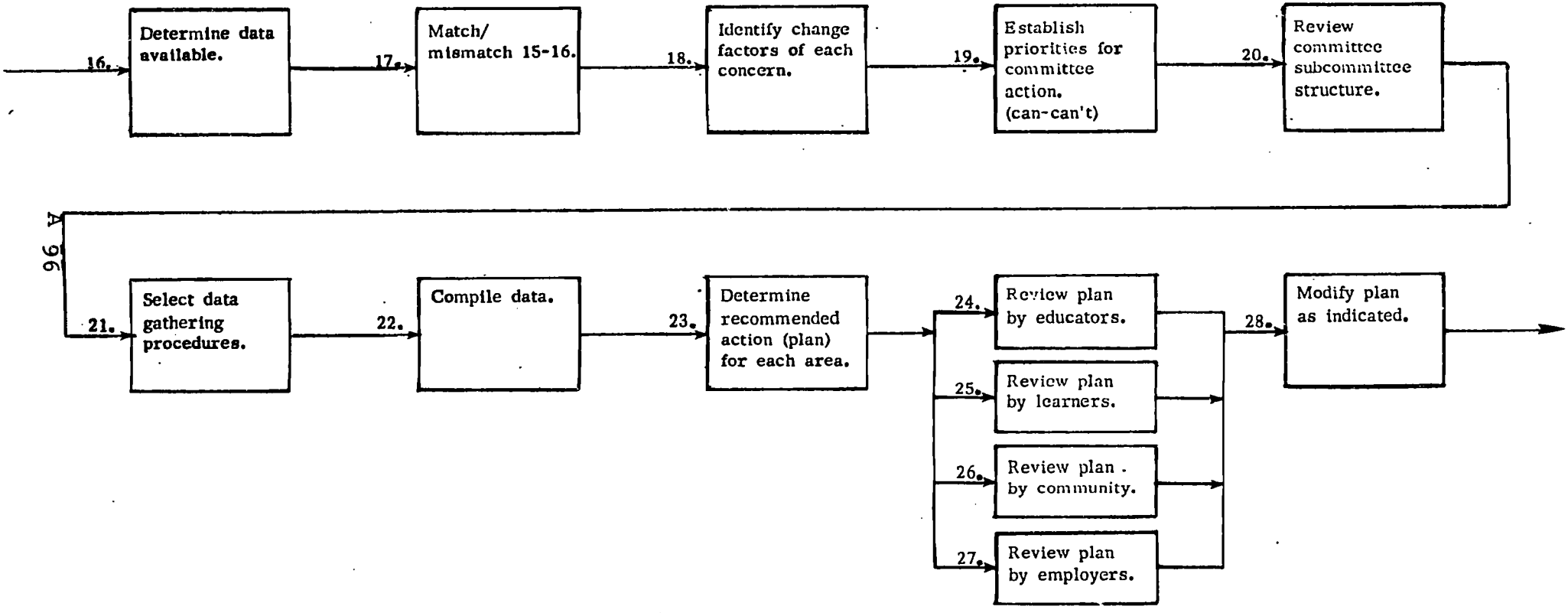
KEY FUNCTIONS



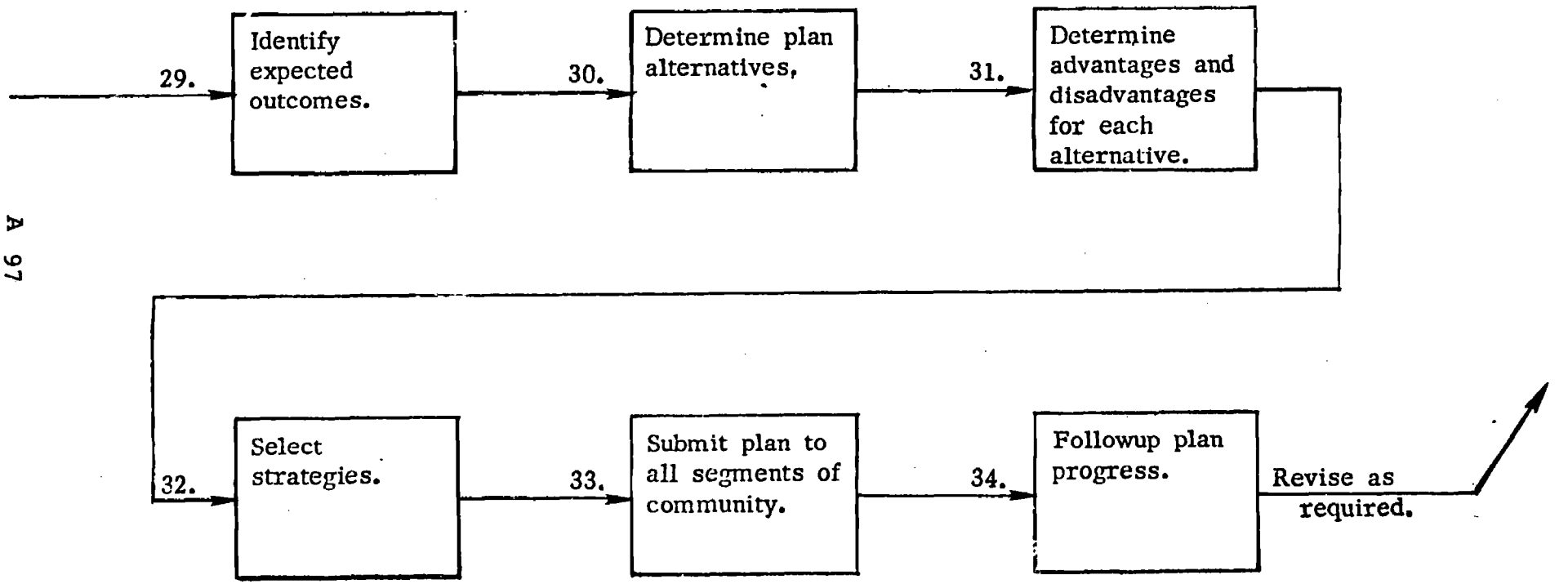
ERIC

MISSION PROFILE, AREA PLANNING




16.
Determine data available.
17.
Match/ mismatch 15-16.
18.
Identify change factors of each concern.
19.
Establish priorities for committee action. (can-can't)
20.
Review committee subcommittee structure.
A 96
21.
Select data gathering procedures.
22.
Compile data.
23.
Determine recommended action (plan) for each area.
24.
Review plan by educators.
25.
Review plan by learners.
26.
Review plan by community.
27.
Review plan by employers.
28.
Modify plan as indicated.

ERIC


29.
Identify expected outcomes.
30.
Determine plan alternatives.
31.
Determine advantages and disadvantages for each alternative.
32.
Select strategies.
33.
Submit plan to all segments of community.
34.
Followup plan progress.
Revise as required.

MISSION PROFILE

for

DEVELOPMENT OF SPECIAL VOCATIONAL EDUCATION ENABLERS FOR PHYSICALLY LIMITED STUDENTS

by

Richard E. Whiteman

A 98/A 99

MISSION OBJECTIVE

By June 30, 1972 Project EPDA, Part F #19-64360-EF053-72 will develop trained personnel on 60% of the community college campus in California who can enable the integration of physically limited students into a main stream of vocational education activity.

The special vocational enabler is envisioned working closely with teachers and counselors in vocational education to make it possible for the physically limited student to benefit from existing or partially modified programs of vocational instruction.

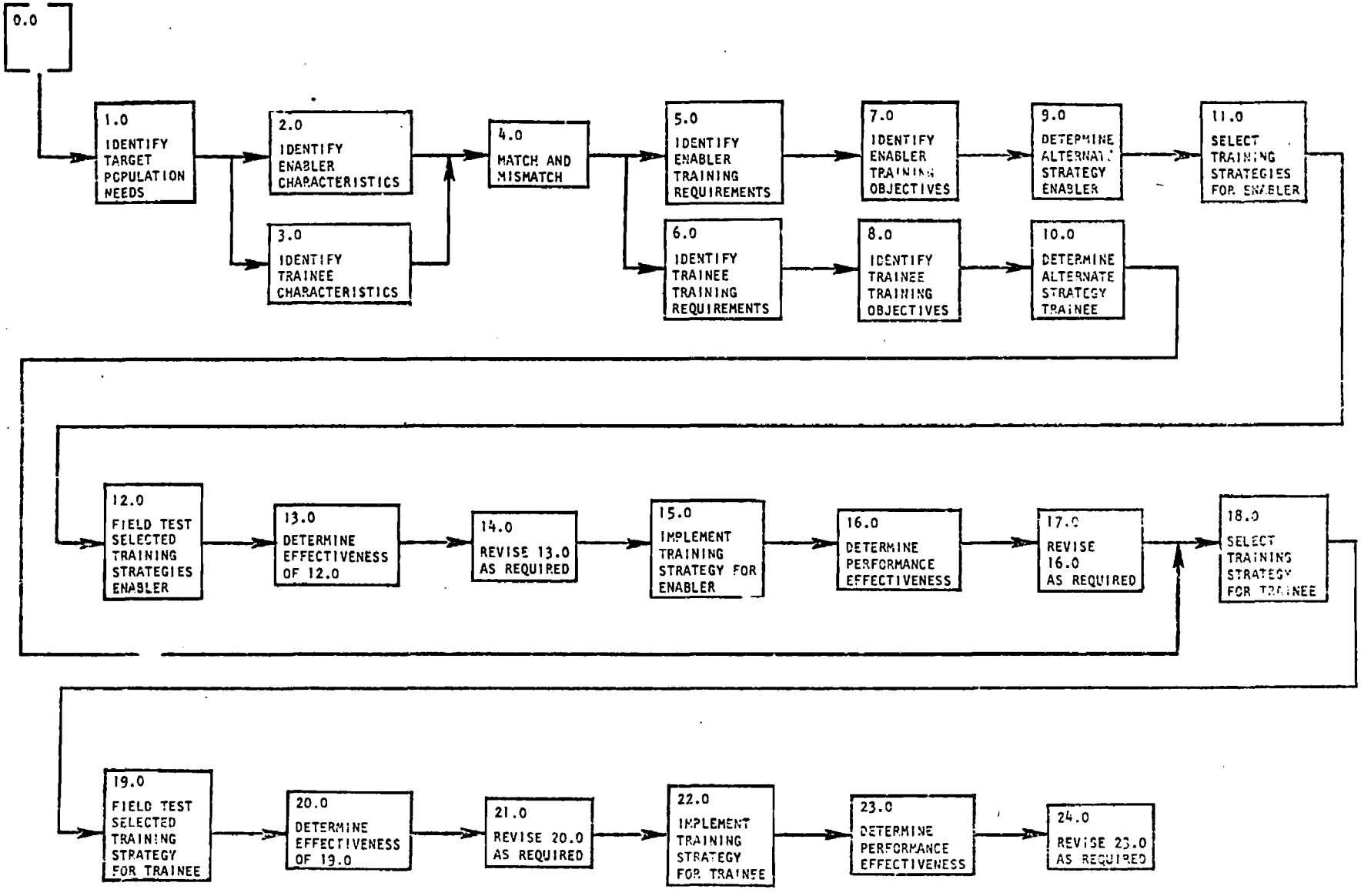
PERFORMANCE REQUIREMENTS

1. Provide a trained vocational educator at Cerritos College Campus to perform this role of special vocational education coordinator for the physically handicapped.

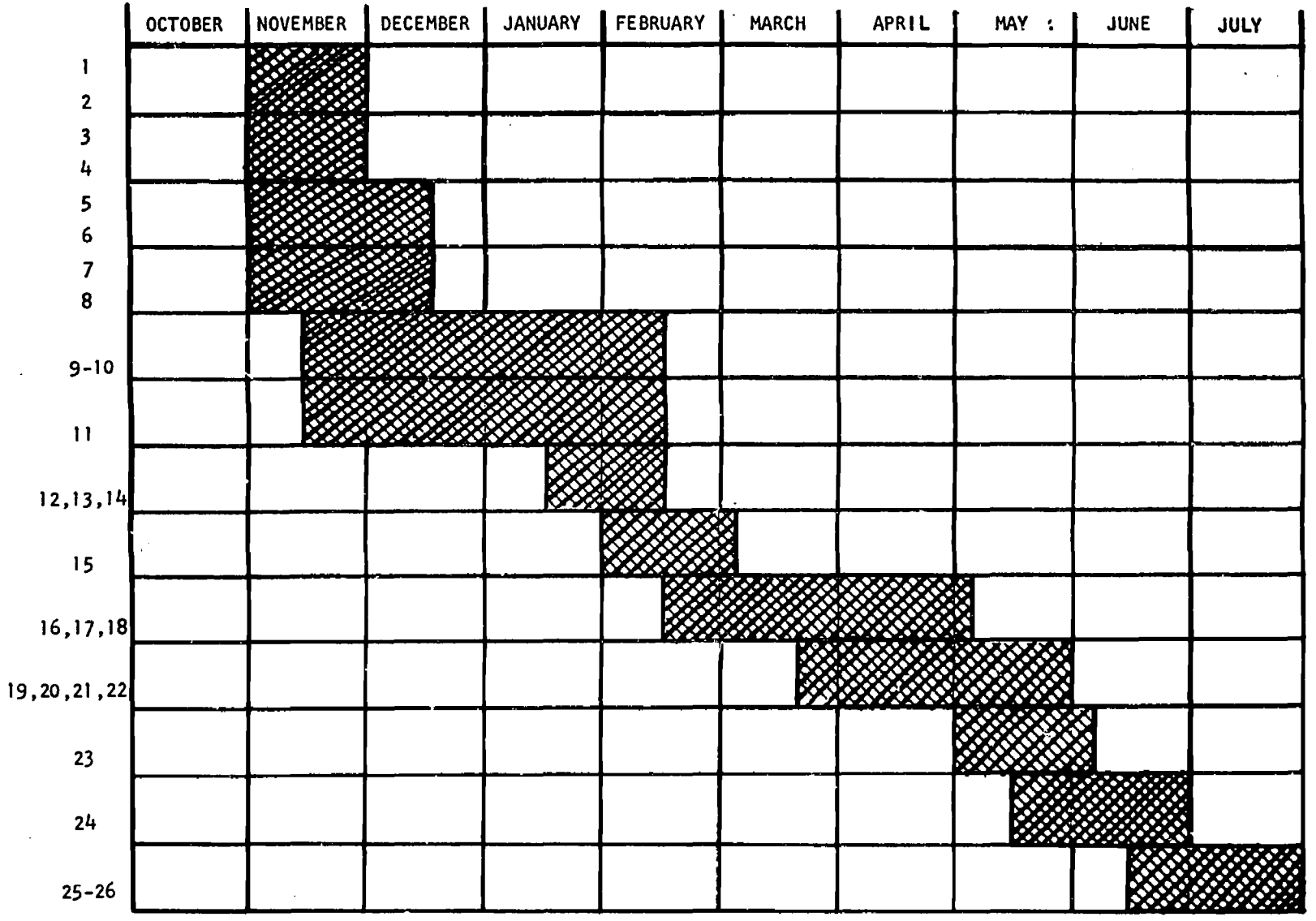
2. Provide for the training of a vocational educator within each California community college district who is skilled in the role of a special vocational education enabler.

3. Provide between eight and ten trained individuals, together with the necessary supportive materials, to act in the role of a special vocational education enabler.

4. Provide materials which support the functioning of a special vocational education enabler in each California community college district as such support relates to the development and funding of college vocational education offerings which improve the vocational education opportunities for the physically limited student.


0.0
1.0 IDENTIFY TARGET POPULATION NEEDS
2.0 IDENTIFY ENABLER CHARACTERISTICS
3.0 IDENTIFY TRAINEE CHARACTERISTICS
4.0 MATCH AND MISMATCH
5.0 IDENTIFY ENABLER TRAINING REQUIREMENTS
6.0 IDENTIFY TRAINEE TRAINING REQUIREMENTS
7.0 IDENTIFY ENABLER TRAINING OBJECTIVES
8.0 IDENTIFY TRAINEE TRAINING OBJECTIVES
9.0 DETERMINE ALTERNATE STRATEGY ENABLER
10.0 DETERMINE ALTERNATE STRATEGY TRAINEE
11.0 SELECT TRAINING STRATEGIES FOR ENABLER
12.0 FIELD TEST SELECTED TRAINING STRATEGIES ENABLER
13.0 DETERMINE EFFECTIVENESS OF 12.0
14.0 REVISE 13.0 AS REQUIRED
15.0 IMPLEMENT TRAINING STRATEGY FOR ENABLER
16.0 DETERMINE PERFORMANCE EFFECTIVENESS
17.0 REVISE 16.0 AS REQUIRED
18.0 SELECT TRAINING STRATEGY FOR TRAINEE
19.0 FIELD TEST SELECTED TRAINING STRATEGY FOR TRAINEE
20.0 DETERMINE EFFECTIVENESS OF 19.0
21.0 REVISE 20.0 AS REQUIRED
22.0 IMPLEMENT TRAINING STRATEGY FOR TRAINEE
23.0 DETERMINE PERFORMANCE EFFECTIVENESS
24.0 REVISE 23.0 AS REQUIRED

CERRITOS COLLEGE
Norwalk, California
Richard E. Whiteman



MISSION PROFILE

for

DEVELOPMENT OF NEEDS ASSESSMENT PROCEDURES

FOR OCCUPATIONAL EDUCATION AT RIVERSIDE CITY COLLEGE

by

Cecil Green

RIVERSIDE CITY COLLEGE - NEEDS ASSESSMENT PROJECT

Situation: Riverside City College (R.C.C.) is serving an increasing population with a 7% unemployment ratio in the community. Programs and courses are currently geared to the academic requirements of learners while __% of the learners enroll and __% graduate from 4-year colleges upon exit from R.C.C.

In order for R.C.C. to serve its constituency, academically and occupationally, it is important to determine the needs, associated requirements for the learners and the community, and determine possible new programs, thrusts and resources to be responsive to the community, the learners, and the faculty of R.C.C.

MISSION OBJECTIVE

By _____(date)_____, have stated in measureable performance terms the following:

1. Needs (gaps between current skills, knowledges, and attitudes and required skills, knowledges, and attitudes) for:

   A. learners in process of taking courses at R.C.C.;

   B. learners who will, in the future, be taking courses at R.C.C.;

   C. learners who have graduated from R.C.C.;

   D. current faculty and staff of R.C.C.;

   E. trustees of R.C.C.;

   F. drop-outs from R.C.C. during the last two years, and reasons given for dropping out.

2. Current employment requirements in R.C.C. community.

3. Anticipated employment requirements in R.C.C. community.

4. Current academic requirements for transfer to 4-year colleges.

5. Anticipated academic requirements for transfer to 4-year colleges.

6. Required employment requirements which are being met by R.C.C. learners and graduates.

7. Required employment requirements not being met by R.C.C. learners.

8. Current employment success by R.C.C. graduates.

9. Current academic success by R.C.C. graduates.

10. Determine 2, 5, 10, and 20 year requirements for R.C.C. for the following:

    A. Curriculum

    B. Teaching, learning facilities and resources

    C. Staff and support

    D. Funding

PERFORMANCE REQUIREMENTS

The plan will be approved by:

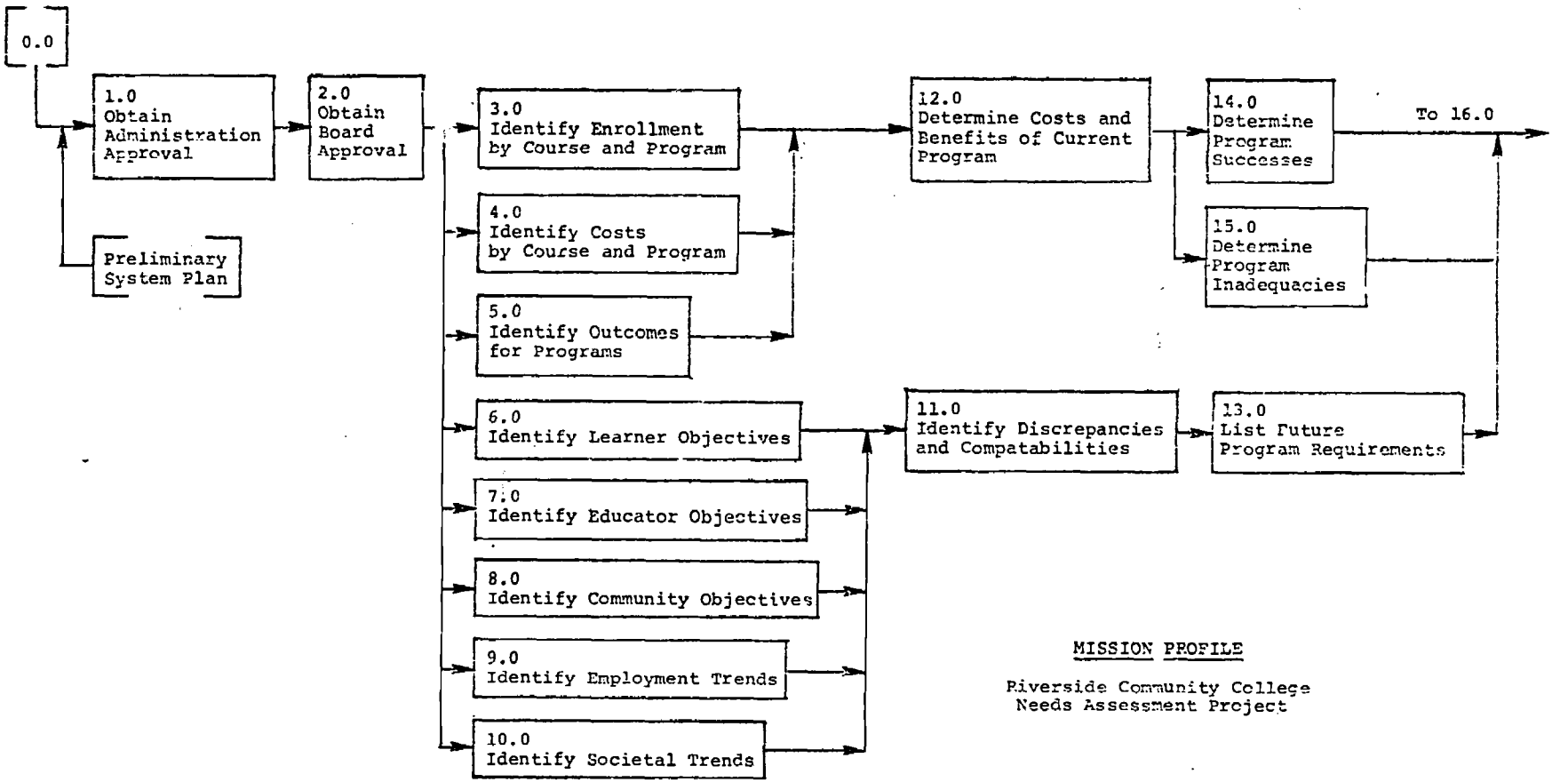
1. Dean of Vocational Education

2. Dean of Instruction

3. President of Riverside City College

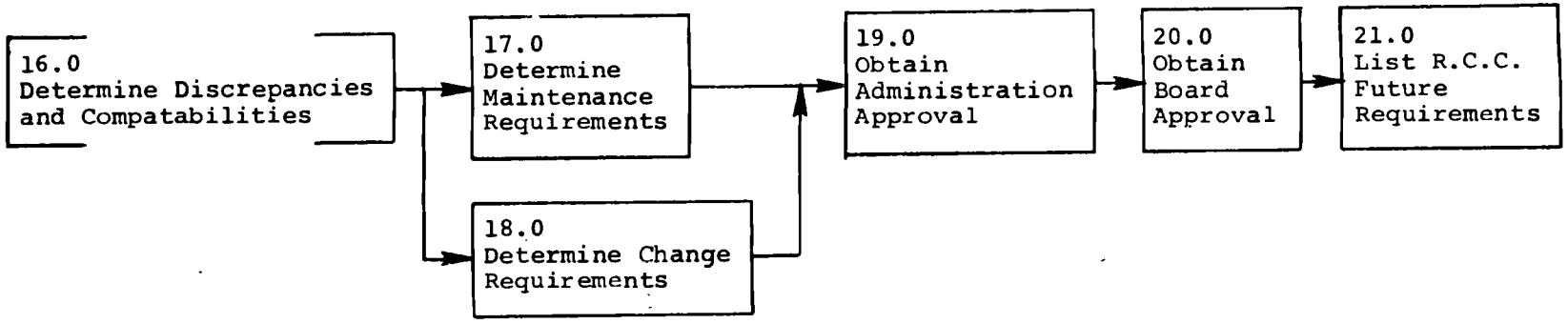
4. Approved as being appropriate by more than half of the R.C.C. Board.

This study will require no more than $_____, and all funds will be approved by the Board.



MISSION PROFILE

Riverside Community College
Needs Assessment Project


16.0
Determine Discrepancies and Compatabilities
17.0
Determine Maintenance Requirements
18.0
Determine Change Requirements
19.0
Obtain Administration Approval
20.0
Obtain Board Approval
21.0
List R.C.C. Future Requirements

APPENDIX B

NEEDS ASSESSMENT TOOLS

This appendix presents samples of two working documents that were used on a bilingual-bicultural project. They represent practical tools for conducting needs assessments and are offered as models for adaptation to similar situations.

Bilingual-Bicultural Education Needs Assessment Scope Determination by Roger A. Kaufman and Otto A. Heinkel

Bilingual-Bicultural Needs Assessments by Otto A. Heinkel, Marie Plakos and Dean G. Klampe

DRAFT

BILINGUAL - BICULTURAL EDUCATION NEEDS ASSESSMENT

SCOPE DETERMINATION

The check list which follows has been prepared to help us in the selection of priority need areas and target populations. Please provide an accurate and complete response to the items listed. Your response will be used to determine policy and funding priorities for the coming year.

PROJECT INFORMATION

Title_____

Location_____

Director_____

LEARNER

For the grade levels in your project, place an "X" in the boxes that you consider to be a critical area of needs as regards the learner. You should mark as many boxes as you see fit, but mark only those boxes where you feel there is a critical need.

	Area	Grade Level												
		Pre K	K	1	2	3	4	5	6	7	8	9	10	11	12
1.	Reading (English)														
2.	Writing (English)														
3.	Oral (English)														
4.	Reading (native language)														
5.	Writing (native language)														
6.	Oral (native language)														
7.	Social Studies														
8.	Cultural Understanding														
9.	Arithmetic														
10.	Career Preparation														
11.	Other (specify) _____ _____														

EDUCATOR

For the educators in your program, check the item(s) below where you perceive a critical need.

1. Native Language skills ☐
2. Self-concept ☐
3. Cultural Understanding ☐
4. Career knowledge ☐
5. Teaching skills and management of learning ☐
6. Curriculum development ☐
7. Evaluation ☐
8. Goals and measurable objectives ☐
9. Planning ☐
10. Commitment to bilingual, bicultural education ☐
11. Attitudes toward minority students ☐
12. Other (specify) _____

_____

COMMUNITY

For the segment of the community that is relevant to your program, check the item(s) below where you perceive a critical need.

1. Understanding of and participation in the designing of project goals and objectives ☐
2. Understanding of the educational program ☐
3. Attitudes toward schools ☐
4. Participation in program ☐
5. Communication Skills ☐
6. Community self-concept ☐
7. Cultural understanding ☐
8. Motivation of themselves and children toward education ☐
9. Other (specify)_____

_____

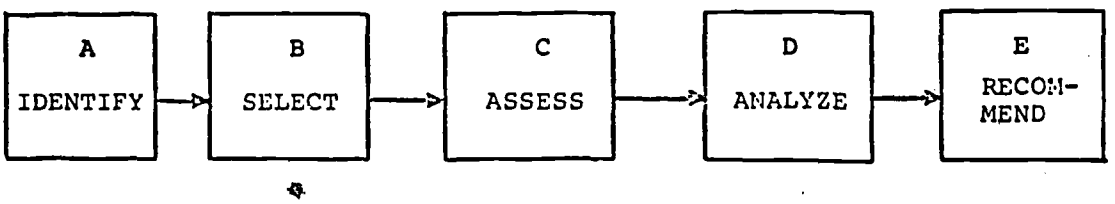
Please mail the completed check list to:

BILINGUAL-BICULTURAL NEEDS ASSESSMENTS

Definition: Needs are defined as gaps between the current outcomes and the desired (or required) outcomes in the skills, knowledge and attitudes of learners, implementers and the community.

A continuous scheduled needs assessment will be conducted relative to the skills, knowledges and attitudes of learners, implementers and community.

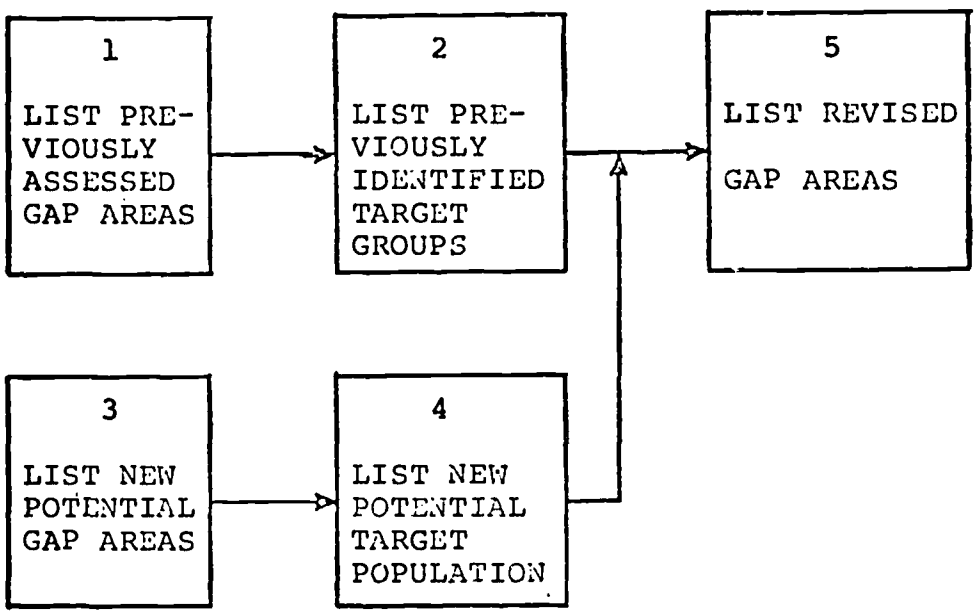
The major events to determine the gap areas are indicated in the flow diagram below:



Descriptions of processes involved for each major event are presented on the flow diagrams that follow.

A. IDENTIFY SKILL, KNOWLEDGE AND ATTITUDE GAP AREAS (NEEDS)

The following flow diagram shows the events associated with the identification of gap areas.



Process Descriptions:

1. LIST PREVIOUSLY ASSESSED GAP AREAS - Obtain these data from existing data bank and list by gap areas (e.g., reading, self-concept, etc.).

2. LIST PREVIOUSLY IDENTIFIED GROUPS - Match the gaps with the various target populations who display the gaps. List the gaps by populations.

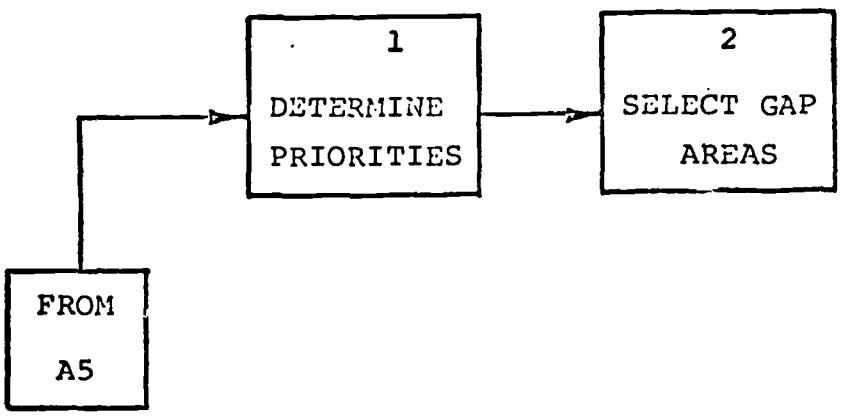
3. LIST NEW POTENTIAL GAP AREAS - Obtain the data and list by gap areas (e.g., reading, self-concept, etc.).

4. LIST NEW POTENTIAL POPULATIONS - Match the gaps with the various target populations who display the gaps. List the gaps by population.

5. LIST REVISED GAP AREAS - Determine new and emerging gap areas by continuous feedback of performance/acceptance data from learners, implementers, and the community.

B. SELECT GAP AREAS TO ASSESS

The Evaluation Team will examine the gap areas and define the requirements affecting further investigation for review and approval by the Project Director. A search of existing literature, research projects, etc., will be made in an effort to determine previous and/or forthcoming documentation to the gap areas and to compare these to identified gaps evidenced in project for program redefinition



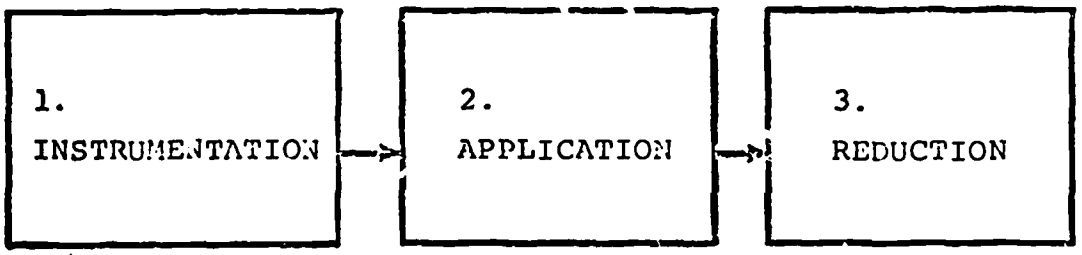
Process Descriptions:

1. DETERMINE PRIORITIES - Determine a gap selection criterion(ia), a gap priority rating procedure, and list gap areas in priority order.

2. SELECT GAP AREAS - Apply a cut-off point to the priority list of gap areas, and list in order.

C. ASSESS NEEDS

The following flow diagram indicates the major events in the assessment process:



Process Descriptions:

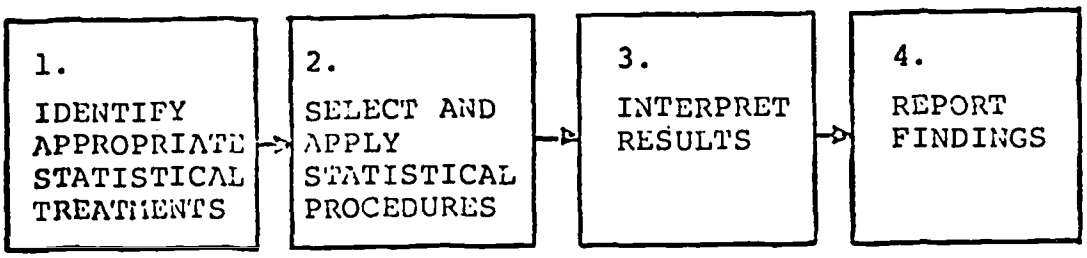
1. INSTRUMENTATION - Develop data gathering strategies based on population requirements and data characteristics, secure necessary approvals and cooperation toward application and conduct preliminary validity check.

2. APPLICATION - Arrange for necessary resources, develop logistics design, apply instruments and gather data.

3. REDUCTION - Retrieve instruments and reduce data to usable form for analysis.

D. ANALYZE RESULTS

The flow diagram below shows the steps outlined for analyzing the results of the assessment process.



Process Descriptions:

1. IDENTIFY APPROPRIATE STATISTICAL TREATMENTS - Identify in terms of questions to be answered and types of data (e.g. nominal, ordinal).

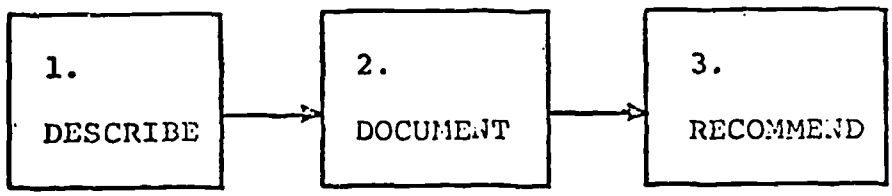
2. SELECT AND APPLY STATISTICAL PROCEDURES - Select procedures suggested by the size of the sample and nature of the data.

3. INTERPRET RESULTS - Describe the outcomes of the statistical tests with particular emphasis on limitations of the statistic as well as significance and power of the tests.

4. REPORT FINDINGS - Design appropriate communication format for communicating with specific target populations. Prepare reporting procedures which may include visual, oral, statistical, and/or narrative.

E. SUMMARIZE DATA

In summarizing the data the following major steps have been outlined:



Process Descriptions:

1. DESCRIBE - Describe current status of needs from on-going assessment.

2. DOCUMENT - Document new gaps identified by current assessment.

3. RECOMMEND - Make recommendations toward priority emphasis and resolution of needs based upon identified learner, implementation, and community accountability factors.

APPENDIX C

WORKSHOP MATERIALS

Throughout the course of the project the instructional materials used are listed below. The items with asterisks in front of the number are included in this appendix. Other items may be obtained from the publishers or the Office of the Project Director.

1. *Designing a Mission Profile Using Function Flow Diagrams.* Based on Kaufman, 1972. Office of the Los Angeles County Superintendent of Schools, Education Planning Center. 1970

2. Ebey. *COPES Guide, 1972 - - Goals and Objectives, Processes, Resources.* 1972.

*3. *How Many Squares?* (Original publication unknown)

4. Insgroup. *Objectives for Instructional Programs.* (A slide-tape presentation). Long Beach, California. 1971. (5855 Naples Plaza, Suite 204, Long Beach, California 90803).

5. Kane, Robert. *Evaluation: What, Why, How.* San Diego Community College District, Office of Research. 1972.

6. Kaufman, Roger A. *Educational System Planning.* New York: Prentice-Hall, Inc. 1972.

*7. Kaufman, Roger A. *A Possible Integrative Model for the Systematic and Measurable Improvement of Education.* American Psychologist, Vol. 26, November 2, March 1971.

8. Kaufman, Roger A. *System Approach to Education Discussion and Attempted Integration,* Social and Technological Change: Implications for Education. Piele, Philip; Eidell, Terry; Smith, Stuart (eds.). The Center for the Advanced Study of Educational Administration, University of Oregon, Eugene, Oregon. 1970.

9. Kaufman, Roger A. *A System Approach to Educational System Planning* (A Slide-tape presentation). Available from the Audio-Visual Division of the University of Minnesota Press. 1971.

10. Kaufman, Roger A. *Management Training and Internship for Vocational Education Using a System Approach.* San Diego Community College District, Office of Research. 1972.

11. Kaufman, Roger A.; Clinkenbeard, William; Wood, R. Ronald. *A Generic Educational Planning Model.* Office of the Los Angeles County Superintendent of Schools, Education Planning Center. 1969.

12. Kaufman, Roger A. and Wood, R. Ronald. *A Preliminary Process Model for the Implementation of the Stull Bill.* California: California Association of School Administrators: A Management Action Paper. 1972

13. Lessinger, Leon. *The Neglected Imperatives in Education--Cost Effectiveness, Productivity, Accountability.* 1972

14. Mager, Robert. *Writing Behavioral Objectives.* California: Fearon Press. 1968.

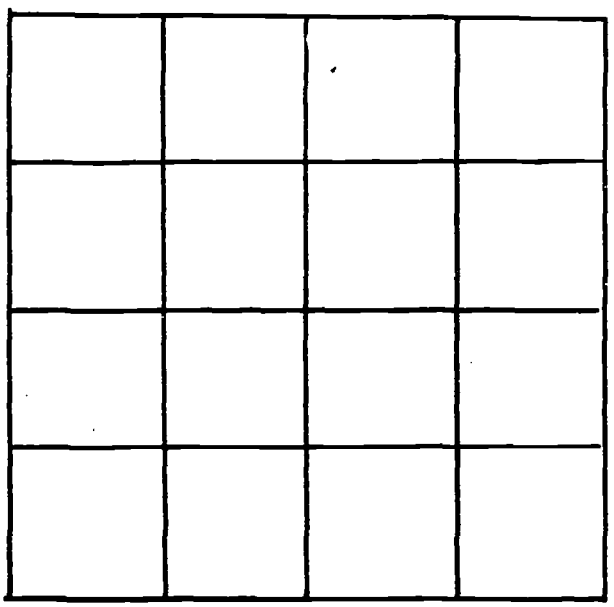
15. *The Neglected Imperatives in Education: Cost Effectiveness, Productivity, Accountability.* Chamber of Commerce of the United States, Washington, D.C. 20006. 1972.

*16. Wood, R. Ronald and Kaufman, Roger A. *Workshop Objectives. Recognizing Performance Objectives. Incomplete Objectives. Writing Mission Objectives. Writing Performance Requirements. Writing a Mission Profile.* San Diego Community College District, Office of Research. 1972.

17. Wood, R. Ronald and Rudolph, James R. *Planning Programming Budgeting System.* A multi-media presentation now available in tape/filmstrip format). Office of the Los Angeles County Superintendent of Schools, Education Planning Center. 1969.

HOW MANY SQUARES

An Exercise in Analysis or, the Obvious Answer May Not Be the Right One



- QUICK MENTAL CALCULATIONS MAY BE DONE INCORRECTLY
- WE ACHIEVE CORRECT SOLUTION FASTER BY COMMUNICATING WITH OTHERS

HOW MANY SQUARES

Let us exercise quick mental gymnastics to determine the number of squares in the illustration. At first hand, we see an obvious 16. But quick calculations can be made incorrectly.

Now, by letting the entire group participate openly, we discover other squares in the illustration. Four more? Now still another one? No, two. After only a few minutes, we can readily point out 30 squares.

This story has two morals:

1. Quick, simple, obvious, mental answers may be incorrect.
2. We achieved the correct solution faster by communicating with others.

This is somewhat like the fox chase where each participant had to bring his own hound. One of the participants brought an outstanding female hound. The horns blew, the fox was released, and a normal chase began. This is, until someone noticed that the fox was running in first place.

Reprinted from AMERICAN PSYCHOLOGIST, Vol. 26, No. 3, March 1971
Printed in U. S. A.

A POSSIBLE INTEGRATIVE MODEL FOR THE SYSTEMATIC AND MEASURABLE IMPROVEMENT OF EDUCATION

ROGER A. KAUFMAN [1]

Graduate School of Human Behavior, United States International University

IT is suggested that the primary function of education is to bring about relevant learning, and the primary task of educators is learning management. The learning management job could be conceived of as being the planning, organizing, designing, implementing, and evaluating of learning situations and outcomes, and making required continuing revisions to assure ongoing relevancy and practicality.

If the above hypothesis is valid, then the way in which salient variables and required resources are identified and utilized becomes the critical question for achieving humane relevant and practical learning outcomes.

It is not uncommon for managers to erroneously start to determine "how" something should be accomplished before "what" is to be accomplished has been adequately identified and defined—perhaps due to a lack of reasonable, cohesive model for educational change. This article presents a possible *process* model for education based on a problem-solving referent, and suggests some alternatives for identifying and possibly integrating current thrusts toward the systematic and valid improvement of education.[2]

A Possible Educational Process Model

Process may be defined as the steps or manner in which an outcome is achieved. A product is an outcome, in the case of education it may be learner skills, knowledges, and attitudes that are identified and measured at a specific time.

[1] Requests for reprints should be sent to Roger A. Kaufman, Graduate School of Human Behavior, United States International University, 8655 Pomerado Road, San Diego, California 92124.

[2] It is not the intent to discuss in detail the several tools identified, but rather to note their existence and present a possible rationale for the integration of a number of thrusts relative to the quantifiable improvement of education. Detailed discussions of these tools may be obtained from a number of sources, only a few of which are noted in the references.

Education may be viewed as a process, a process to provide learners with the required skills, knowledges, and attitudes to be able to survive and contribute in the world to which they are to go when they legally leave the educational agency (Kaufman, Corrigan, & Johnson, 1969). In keeping with this process analogy, education may be viewed as the identification and resolution of problems—what should learners be able to know and do when they graduate (or legally leave the educational agency), and what should be done to provide them with the requisite skills, attitudes, and knowledges.

A number of models, not too dissimilar, have been proposed for both education and problem solving (Carter, 1969; Corrigan & Kaufman, 1966; Kaufman, 1968; Lehmann, 1968). One model familiar to many philosophers as the "scientific method" basically consists of the steps of problem identification, setting goals or hypotheses, selecting solution strategies, hypothesis testing, evaluation, and revision.

Corrigan and Kaufman (1966) have suggested a six-step problem-solving model that seems applicable to the management of learning. The six steps are shown in Figure 1. This model has been frequently called a "system approach" to education, representing a closed-loop, self-correcting process for proceeding from identified needs to predictable outcomes (Corrigan & Associates, 1969; Corrigan & Kaufman, 1966; Kaufman, 1970).

Other models have been suggested for "systems" approaches (Kaufman, 1970), varying from Lehmann's (1968) seven-step model to other models which frequently start the educational process from varying points of departure (Cleland & King, 1968; Gibson, 1968; Silvern, 1968; Tanner, 1969).

It is suggested that the above six-step "system" process model is appropriate for describing the educational management process, and that it may be used for a preliminary referent for identifying and integrating current useful thrusts for the quantita-

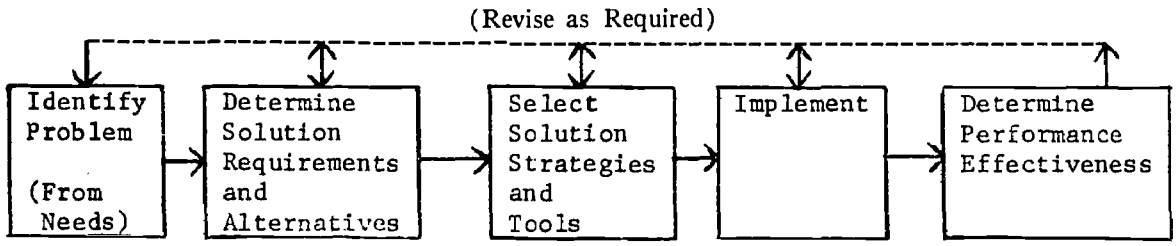


FIG. 1. A six-step problem-solving model for application to education. (The six steps are identified, five within the boxes, and the sixth represented by the broken line which indicates revision as required by performance.)

tive improvement of education. Such thrusts include needs assessment; system analysis; behavioral (performance) objectives; planning, programming, budgeting system (PPBS); methods-means selection; testing and assessment.

DESCRIPTION OF A SYSTEM PROCESS

The above identified process model for education indicates six related functions or parts:

1. Identify problem (based on documented needs)
2. Determine solution requirements and solution alternatives.
3. Select strategies and tools.
4. Implement.
5. Determine performance effectiveness.
6. Revise as required.[3]

Identify Problem

The first step in the suggested process model is to identify the problem(s) based on documented needs. A need may be defined as the discrepancy between "what is" and "what should be" (Kaufman, 1968). A problem is identified when a particular discrepancy or set of discrepancies have been selected for resolution. The identification of a problem includes the specific delineation of requirements for problem resolution—a definition of required terminal product (or outcome).

Determine Solution Requirements and Solution Alternatives

After the problem has been identified, an analysis is undertaken to determine the detailed requirements for proceeding from the current state (what is) to the required state (what should be). These consist of delineation of overall objectives and subobjectives (products and subproducts) in measurable performance terms. Additionally, while detailed requirements are being analyzed and identified, possible solution strategies and tools are identified (but not selected) for accomplishing the requirements, including a determination of the advantages and disadvantages of each relative to producing the required outcome(s).

Select Strategies and Tools

From the alternatives identified in the previous step, criteria for selection are determined, and the selection of appropriate tools and strategies is accomplished. Frequent selection criteria include cost-benefit or other effectiveness-efficiency indicators.

Implement

Based on the needs, the detailed requirements, and the alternative ways of getting the outcomes accomplished, the selected tools and strategies (the ways and means of getting from "what is" to "what should be") are designed, purchased, or otherwise obtained, and utilized. This is the "doing" phase, where the actual solution strategies and tools are utilized and appropriate performance data collected.

Determine Performance Effectiveness

Based on the needs and the requirements, the outcomes of the problem-solving process are evaluated to determine the extent to which required results have been achieved.

Revise as Required

Any time a performance requirement is not met, necessary revision is required. This critical step assures that a self-correcting process is utilized, and increases the probability of effective and efficient outcomes being obtained. It should be noted that

[3] An analogous version of this process was recommended recently by The Forum on Educational Technology of the 1970 White House Conference on Children.

in the suggested model, revision may be required at any step, or point, in problem solving—it is not necessary to commit to a "disaster plan" and have to wait until the plan has been fully implemented to institute required changes.

It is suggested that this six-step process model may have basic utility for the design and accomplishment of humane effective and efficient education—the first two steps identify the "whats" of problem solution, and the remaining steps identify the "hows."

CURRENT THRUSTS FOR MEASURABLE IMPROVEMENT OF EDUCATION

Springing from a number of philosophical and operational sources, several tools have come to the attention of educators as providing rational and realistic ways of improving the educational product. These include:

1. Needs assessment (Corrigan & Kaufman, 1966; Kaufman, 1968; Sweigert, 1968a, 1968b).
2. System analysis (Corrigan & Kaufman, 1966; Kaufman, 1968, 1970).
3. Behavioral objectives (Mager, 1962; Popham, 1966; Smith, 1964).
4. Planning, programming, budgeting system (Carpenter, 1968; Katzenbach, 1968; Parker, 1969; Rath, 1968; United States Air Force, 1968; United States Government, 1967, 1968).
5. Methods-means selection process (Briggs, 1967; Corrigan, 1966, 1969).
6. Testing and national assessment (Brain, 1969; Glaser, 1966).

Rather than indicating that any of the above tools are better than others, or even requiring a selection of one, each individually and collectively seems to hold promise to educators for the measurable improvement of educational activities and outcomes.

Needs Assessment

Many educators have become concerned with not only learning, but the determination of "what" should be learned as a necessary prerequisite to achieving relevant learning outcomes. Needs assessments are formal attempts at determining what should be done and learned in schools. First attempts in California, for instance, were made by many of the Elementary and Secondary Education Act Title III PACE Centers, and the results of these are well covered by Sweigert (1968a, 1968b).

Needs assessment procedures seem to be keyed to the concept that relevancy of education must be determined empirically from the outset by a formal procedure which preceeds educational planning, design, and implementation (often starting from the identification of symptoms). In most forms, needs assessment identifies and documents the discrepancies between "what is" and "what should be" and provides a valid starting point for education.

System Analysis

System analysis is a process for determining the requirements for getting from "what is" to "what should be." As conceived by Kaufman and Corrigan (Corrigan & Kaufman, 1966; Kaufman, 1968), it consists of analysis, in levels or layers, of requirements for problem solution. They identify the analysis steps of (*a*) mission analysis, (*b*) function analysis, (*c*) task analysis, and (*d*) methods-means analysis. The outcome of a system analysis is a delineation of feasible "whats" for problem solution, and a listing of possible strategies and tools for achieving each "what."

Behavioral Objectives

A number of usable presentations have been made on behavioral objectives (Mager, 1962; Popham, 1966; Smith, 1964), all agreeing on the desirability of stating learning outcomes in measurable performance terms. Usually included in a behavioral objective is the statement of terminal performance including (*a*) what is to be done, (*b*) by whom is it to be done, (*c*) under what conditions is it to be done, (*d*) what criteria will be used to determine its accomplishment. While most discussions of behavioral objectives are relative to the instructional process directly, the same criteria may be applied to other educational activities as well.

Planning, Programming, Budgeting System (PPBS)

Perhaps first formally applied in the context of national defense, PPBS represents an extremely powerful tool for educators. In the main, it provides a means for answering questions of education relative to "what do I give" and "what do I get." PPBS deals with these questions; it identifies the relationships between product outcomes and costs for achieving the outcomes for various alternative methods and means. Many discussions of PPBS indicate that it starts with a system analysis (or work breakdown structure, or program structure) in

order that viable alternatives may be considered, projected, and evaluated. A number of good, detailed references are available (Carpenter, 1968; Katzenbach, 1968; Parker, 1969; Rath, 1968; United States Air Force, 1968; United States Government, 1967, 1968).

Methods-Means Selection Process

Closely related to PPBS are procedures for deciding among alternative methods and means (strategies and tools) for achieving required outcomes. Briggs et al. (1967) offer a text on methods-media selection, and Corrigan (1966) has developed procedures for making effective and efficient media decisions. These methods-means selection procedures are generally based on the specification of the nature of the learner and the characteristics of available tools and strategies, and the specifications for the learning to be accomplished. Cost-effectiveness is a key criterion.

Testing and National Assessment

Testing, of course, is not new to education—in fact, most of the major testing tools have been developed by or for educators. Testing provides an understood manner for determining the effectiveness of any treatment, and new tests are being developed constantly. There appear to be, however, some developments in testing that seem to offer promise for educators interested in valid planned change. One of these developments which relate to measurable performance objectives is "criterion-referenced" testing (Glaser, 1966) which provides an alternative to norm-referenced tests. Some major testing concerns are, it is understood, developing criterion-referenced testing instruments.

National assessment is now underway and will provide empirical data relative to how well and how much education is teaching our youngsters (Brain, 1969). Testing is an evaluation tool for determining the extent to which we have achieved that which we set out to achieve.

These tools, described all too briefly above, are of interest for a number of reasons: (*a*) they are empirically grounded, and attempt to quantify that which should or that which is being accomplished in education; (*b*) they are being considered and in some cases being used by educators; and (*c*) in some cases, they are mandated for use.

These tools are not unrelated, and following is a suggested manner in which they may be related each to the others and to an overall model for the educational process.

AN ATTEMPT AT AN INTEGRATION OF EDUCATIONAL TOOLS

If logical problem solving may be said to follow the above six-step model, then it would seem to be critical to start the process with the advantage of having empirical data to document the problem and its characteristics. Such a beginning referent may be accomplished by an *educational needs assessment*. Such an assessment of needs might well tell us (perhaps only minimally) the discrepancies between "what is" and "what should be" so that a valid starting point may be identified.

After a needs assessment has been accomplished, and the specification of the two polar dimensions for problem solving stated (what is and what should be), further delineation of requirements should be made to determine the subobjectives and requirements for getting from where we are to where we are to be. This analysis may be accomplished by the process tool described earlier as system analysis. The system analysis will provide detailed information relative to solution requirements, and will indicate possible alternative methods and means for accomplishing each requirement. Where instructional programs are being considered, the requirements may be stated in terms of behavioral objectives—learning specifications in measurable performance terms. (For management programs, the requirements would be also stated in performance terms.)

The third function identified in the problem-solving process model is to select solution strategies from alternatives. Here, the basic intent and tools of PPBS seem appropriate. Based on the data obtained from the needs assessment, the system analysis (and possible statement of behavioral objectives), alternative outcomes and tools may be considered, compared each to the others, projected and selected. In the case of media, methods-means selection procedures may offer a usable tool for selecting appropriate tools and strategies.

Implementation, the fourth function, is the "meat" of the process which is familiar to most educators, and certainly to educational administrators. This how-to-do-it portion is not formally considered here, primarily because it is covered in great detail in texts for schools of administration and management. [It might be noted that tools such as Pro-

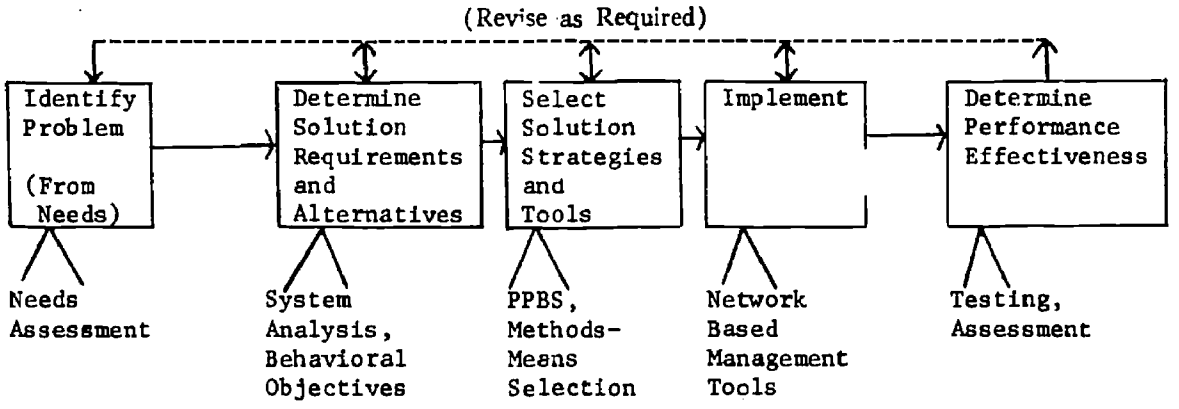


FIG. 2. A possible relationship between current tools for the improvement of education and their relationship with a problem-solving process and a possible model for educational management.

gram Evaluation Review Technique (PERT) or Critical Path Method (CPM) and other network-based techniques have much to offer the implementer (Cook, 1966, 1967).]

The fifth step is "determine performance effectiveness." Here, testing and assessment procedures provide a natural tool for determining how well or how poorly we have achieved our objectives and reduced or eliminated the delineated needs. Evaluation based on the determined requirements will tend to improve the validity of the testing/assessment procedure.

By following the functions described in Figure 1, there seems to appear a natural relationship between extant tools for the improvement of education, and for each tool with the overall problem-solving process (Kaufman, 1970). Figure 2 presents a graphic of this suggested relationship.

It should be noted that not all of the tools are completely independent—for instance, PPBS is sometimes preceded by a system analysis; and some discussions of behavioral objectives include the requirement for a system analysis and/or a needs assessment.

It would seem to suggest, however, that greater utility may be obtained from current educational improvement efforts if each of the "thrust" tools could be defined, and if each group working on the improvement of education could work together from a common referent of what is to be done, and how to do it. Perhaps cooperative efforts could reduce or eliminate redundancy of efforts, and provide a single, understandable referent to educational practitioners. For instance, those working on the specification of minimal objectives for high school graduation could obtain data from those conducting needs assessments and system analyses to improve the probability of validity of the graduation objectives (e.g., an objective may be quite measurable and written in performance terms, but be trivial or even wrong!). Those working on PPBS might also benefit from the outcomes of needs assessment, system analysis, and behavioral objectives in order to assure that alternatives being considered are valid.

Each of the six steps (functions) shown in Figures 1 and 2 can be accomplished individually by repeating the six-step problem-solving process for each step. Thus, for each step there is a requirement for planning which takes the form of determining a discrepancy between a current situation and a required situation, and then the additional five steps are applied to further identify and bridge that particular gap. It is perfectly possible to start educational activities at any of the six steps if one is willing to assume that the previous steps have been accomplished or if the data from the previous steps are available. Since planning takes place at each step, it is not surprising to find that various tools for planning appropriate to each step have been identified and are being used in actual practice.

It is suggested here that there is a possible taxonomy of educational planning based upon where one starts in the overall six-step process, with each step building, either by assumption or with data, upon the previous steps. If this is true, it would be possible to conceptualize a possible taxonomy, each step in planning associated with its starting point within the six-step process: Alpha planning

would use the tools of needs assessment; Beta planning would build on this and use tools such as system analysis; Gamma planning would continue and use tools such as PPBS (or its relative systems analysis); Delta planning would continue using network-based tools; Epsilon planning might use the tools of experimental design to determine the gap between objectives and outcomes; and finally Zeta planning might use a discrepancy analysis similar to that used in Alpha planning to determine what should be done to revise previous procedures as indicated by performance (summative and formative evaluation). Thus, in this possible planning taxonomy, each step, or level, consists of planning what to do plus doing what you have planned in the current and preceding steps. Some of the specific tools used in planning for each level of the taxonomy are seen as being most appropriate for that level and thus seem to depend on data from previous planning and accomplishment.

SUMMARY

The preceding presentation was intended to provide a possible rationale for cooperation and interdependence between professional educational practitioners who are working to measurably improve the products and processes of education. A possible overall, or generic, model for educational management was presented, identifying six steps for problem solving. Additionally, tools currently being used for the quantifiable improvement of education were briefly presented and discussed.

Finally, an attempt was made to relate the currently utilized tools for the improvement of education with the suggested process model of education, and also relating each of the tools with the others. A possible educational taxonomy of planning was suggested.

It is hoped that an integration of tools and purposes may be achieved so that education may be aided, in processes and outcomes, by a cooperative, systematic, empirical, and evaluatable definition and attack on current and future educational problems.

REFERENCES

BRAIN, G. B. What's the score on national assessment? *CTA Journal*, 1969, 65, 3–8.

BRIGGS, L. J., ET AL. *Instructional media: A procedure for the design of multi-media instruction.* Pittsburgh, Pa.: American Institutes for Research, 1967.

CARPENTER, M. B. Program budgeting as a way to clarify issues in education. Santa Monica, Calif.: RAND Corporation, July 1968. (Mimeo)

CARTER, L. F. The systems approach to education—the mystique and the reality. System Development Corporation, SP-3291, January 1969. (Mimeo)

CLELAND, D. I., & KING, W. R. *Systems analysis and project management.* New York: McGraw-Hill, 1968.

COOK, D. L. PERT: Applications in education. (Cooperative Research Monograph No. 17, OE-12124) Washington, D. C.: United States Government Printing Office, 1966.

COOK, D. L. Better project planning and control techniques through the use of system analysis and management techniques. A paper presented at the Symposium on Operations Analysis in Education, sponsored by the National Center for Educational Statistics, United States Office of Education, November 1967.

CORRIGAN, R. E. System cost/effectiveness criteria or selecting the proper resources and plans to achieve stated mission objectives. Visalia, Calif.: PEP, Tulare County Department of Education, 1966. (Mimeo)

CORRIGAN, R. E., & ASSOCIATES. System approach for education (SAFE). Garden Grove, Calif.: Author, 1969. (Mimeo)

CORRIGAN, R. E., & KAUFMAN, R. A. The steps and tools of the system approach to education. (A number of documents were produced for Operation PEP and the Chapman College Experiences Teacher Fellowship Program in the area of a System Approach by R. E. Corrigan, B. O. Corrigan, D. Goodwin, and R. A. Kaufman during the period 1965–68.) Visalia, Calif.: Operation PEP, Tulare County Department of Education, 1966.

GIBSON, L. Instructional systems design through in-service education. *Audiovisual Instruction*, 1968, 13, 710–714.

GLASER, R. Psychological bases for instructional design. *AV Communication Review*, 1966, 14, 433–449.

KATZENBACH, E. L. Planning, programming budgeting systems: PPBS and education. The New England School Development Council, March 1968. (Mimeo)

KAUFMAN, R. A. A system approach to education: Derivation and definition. *AV Communication Review*, 1968, 16, 415–425.

KAUFMAN, R. A. System approaches to education: Discussion and attempted integration. Part 3 of a monograph, *Social and technological change: Implications for education.* Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1970.

KAUFMAN, R. A., CORRIGAN, R. E., & JOHNSON, D. W. Toward educational responsiveness to society's needs: A tentative model. *Journal of Socio-Economic Planning Sciences*, 1969, 3, 151–157.

LEHMANN, H. The systems approach to education. *Audiovisual Instruction*, 1968, 13, 144–148.

MAGER, R. F. *Preparing instructional objectives.* Palo Alto, Calif.: Fearon, 1962.

PARKER, S. Planning-program-budgeting system. *CTA Journal*, 1969, 65, 9–11.

POPHAM, W. J. *Educational objectives.* Los Angeles: Vimcet Associates, 1966.

RATH, G. J. PPBS is more than a budget: It's a total-planning process. *Nation's Schools,* 1968, **82**, 53–59, 90.

SILVERN, L. Cybernetics and education K-12. *Audiovisual Instruction,* 1968, **13**, 267–272.

SMITH, R. G. The development of training objectives. (Human Resources Research Office Bulletin 11) Washington, D. C.: George Washington University, June 1964.

SWEIGERT, R. L. The discovery of need in education: Developing a need inquiry system. *Journal of Secondary Education,* 1968, **43**, 343–348. (a)

SWEIGERT, R. L. Need assessment—the first step toward deliberate rather than impulsive response to problems. California State Department of Education, 1968. (Mimeo) (b)

TANNER, C. K. Techniques and application of educational system analysis. *Audiovisual Instruction,* 1969, **14**, 89–90.

UNITED STATES AIR FORCE. Work statement preparation. (System Command Manual 70-5) February 1, 1968.

UNITED STATES GOVERNMENT. Work break down structure for defense material items. (Mil.-Standard 881) November 1, 1968.

UNITED STATES GOVERNMENT, Department of Defense. Performance measurement for selected acquisitions. (DOD Instruction 7000.2) December 12, 1967.

System Analysis Workshop
Objectives
R. Kaufman, R. Wood

WORKSHOP OBJECTIVES

1.0 Working with Objectives

Following the presentations and using the instructional materials given, each participant will be able to, with at least 90% accuracy:

1.1 After viewing the tape/film-strip "Objectives for Instructional Programs," complete the accompanying worksheet.

1.2 (Optional) After having read Mager's Preparing Instructional Objectives, complete the post test at the end of the book (with less than seven errors).

1.3 When given a list of 20 statements of educational outcomes, identify those objectives which are stated behaviorally and those which are not.

1.4 From the list in 1.3 above, complete in writing at least five of the non-behaviorally stated objectives using the criteria for stating objectives presented during the workshop.

1.5 Write three or more Performance Objectives in a subject area of choice using the criteria for stating objectives presented during the workshop.

2.0 Identify Educational Need(s)

Following the presentations and using the instructional materials given, each participant will be able to, with at least 90% accuracy:

2.1 Identify in behavioral terms the "what is" dimension of an educational need.

2.2 Identify in behavioral terms the "what should be" dimension of an educational need.

2.3 Identify in behavioral terms the discrepancy between "what is" and "what should be."

3.0 Performing a Mission Analysis

Following the presentations and using the instructional materials given, each participant will be able to, with at least 90% accuracy:

3.1 Define a Mission Objective related to the educational need identified in 2.3 above; the Mission Objective will meet the criteria presented during the workshop.

3.2 Identify the Performance Requirements related to the Mission Objective in 3.1 above; the Performance Requirements will conform to the criteria presented during the workshop.

3.3 Develop a Mission Profile related to 3.1 and 3.2 above; the Mission Profile will identify the major functions (or whats) to be accomplished in getting from "what is" to "what should be."

If a participant should finish the objectives in 3.0 above and still have time during the workshop for futher work, he can begin the following:

* Function Analysis

* Task Analysis

* Methods/Means Analysis

The above three Analyses will be discussed during the workshop.

System Analysis Workshop
Worksheet 1.3
R. Kaufman, R. Wood

RECOGNIZING PERFORMANCE OBJECTIVES

Directions: Leaving aside the matter of content, decide for each statement whether it is expressed in terms of observable student performance. Place a "B" for behavioral in front of each behavioral statement and "NB" for non-behavioral in front of the others.

1. At the end of the first semester, at least 80% of the students in Typing I will type 40 or more words per minute on a five minute timed test with five or less errors.

2. Each student will be able to write shorthand well, using the Gregg System taught in class.

3. Following at least two years of training, at least 80% of the Business Majors will be able to find jobs within one year of graduation in the area in which they specialized.

4. Given a year of training in data processing, 80% or more of the students will develop a data processing program which, when run through a computer, will yield the required data without errors.

5. At least 70% of the students in the Business Machines class will be able to run most of the business machines in the business lab.

6. After having taken the class in Business Communication, at least 80% of the students will write good business letters.

7. At least 80% of the Business Majors will pass the ability tests given by major industries surrounding the college.

8. Given the total amount of a loan, the monthly rate of interest, and the monthly payment rate, the student should be able to compute in writing the amount of principal paid each month, the number of monthly payments necessary to repay the loan, and the effective annual interest rate.

9. Given two semesters of accounting, at least 90% of the students will keep a good record of accounts in a simulated accounting exercise.

10. When given an attitude questionnaire, attitude check list, and attitude survey, at least 80% of the Business Majors will have good attitudes toward Business Education.

11. When given a ten minute dictation at 80 words per minute, at least 70% of the second year shorthand students will be able to take the dictation with no more than two errors.

12. Within five years following graduation, 10% or more of the graduates with Business Majors will have supervisory positions in their companies.

13. After completing a semester in key-punch operation, the students will learn how to do it correctly without errors.

14. Given the characteristics of a material for use as money, and the description of a situation in which silver became unavailable, the student should be able to understand how one or more other materials might be substituted.

15. Given a business letter with incorrect punctuation, at least 80% of the students in Business Communication II will correct the errors and insert the required punctuation marks with 95% or more accuracy.

16. Given an accounting ledger with five errors, at least 90% of the second-year Accounting majors will be able to identify and correct each of the errors.

17. Given 20 dictated words containing the consonant elements "n," "p," "m," "t," and "f," and the short vowels "a" and "i", at least 90% of the first semester shorthand students should be able to hear, with at least 90% accuracy, the designated consonant elements and short vowels in the dictated words.

18. The Business majors will learn how to write intra-office memos.

19. During each of the next five years, at least 10% more of the students taking Business classes will become Business majors.

20. As a result of being in the Business Education program, most of the participating students will learn to like business as a career.

System Analysis Workshop
Worksheet 1.4
R. Kaufman, R. Wood

INCOMPLETE PERFORMANCE OBJECTIVES

Directions: On the previous worksheet, you identified educational outcomes which were behaviorally stated; on the same worksheet, there were non-behaviorally stated outcomes. In the space below, rewrite any five of the incomplete performance objectives into performance objectives which meet the three criteria presented in the workshop.

1.

2.

3.

4.

5.

System Analysis Workshop
Worksheet 1.5
R. Kaufman, R. Wood

WRITING PERFORMANCE OBJECTIVES

Directions: Now that you can recognize a well-stated performance objective and have had the opportunity to correct some poorly stated ones, it's time to get your own feet wet. In the space below, write three objectives which relate to student behavior in your subject area or course. Remember to state the objectives so they meet the criteria presented to you earlier. Have fun!!!

1.

2.

3.

System Analysis Workshop
Worksheet 2.0
R. Kaufman, R. Wood

IDENTIFYING EDUCATIONAL NEED(S)

Congratulations! You can now write measurable objectives well enough to satisfy any boss. This skill becomes quite important in system analysis as you will soon see. Now, however, let's turn our attention to the starting point in system analysis--the identification of need(s). As stated in the material you were presented, a need is defined as the measurable discrepancy between "what is" and "what should be." Whenever possible, these dimensions of need should be stated in observable, measurable terms.

Directions: On this sheet, identify an educational need which is relevant to your situation. Identify "what is" and the "what should be" for each of the partners in education, the students, educators, and community. The need which you identify below will become the first step in your system analysis, so make sure that it is important to you and your "back home" situation.

	What Is	What Should Be
Students		
Educators		
Community		

System Analysis Workshop
Worksheet 3.1
R. Kaufman, R. Wood

MISSION ANALYSIS--DEFINING THE MISSION OBJECTIVE*

When you have completed the need(s) assessment, the next step is to perform the Mission Analysis. The Mission Analysis is a determination of where one is going and how to know when one has arrived. Mission Analysis includes the following three steps: 1) Identifying an overall Mission Objective, 2) Identifying the specific, measurable Performance Requirements for completing the mission, and 3) A management plan called a Mission Profile. On this worksheet, attention is focused on the first of these three--defining the Mission Objective.

Once a person can satisfactorily write a performance objective (as you can), defining a Mission Objective comes easily. A Mission is the job we want done. A Mission Objective is a precise statement expressed in operational or action terms which identifies the overall intent of a mission (or the job to be done). A Mission Objective is a performance objective. As such, it requires the same degree of specificity as any other performance or behavioral objective. You might look at a Mission Objective as a statement in performance terms of what must be accomplished in order to satisfy an identified need. A Mission Objective should state the following:

1. What is to be done.
2. Where it is to be done.
3. When it is to be done.
4. How much or how well it is to be done.
5. Who is to do it.

---

* Adapted from the following source: Kaufman, Roger; Corrigan, Robert; Corrigan; Betty, and Goodwin, Donald, "Mission Analysis in Education" (California: San Mateo County Department of Education, Operation PEP, 1967).

As an example, one could define the following Mission Objective for the need identified on the previous worksheet:

> By June 1, 1972, Mr. Jones and the staff of the Business Department at California Community College will develop a curriculum for the Typing I class which will raise the average typing speed of at least 90% of the enrolled students to fifty or more words per minute with two or less errors on a five minute timed test by the end of the course.

The Mission Objective sets up the goal. It designates exactly where we are going, what we are going to do and/or what we are going to produce. Without a clearly stated Mission Objective, one cannot predict with any degree of validity and assurance whether the required end-product will be achieved. Why should one bother to be as precise as possible in stating a Mission Objective? The reason is simple; one of the basic reasons for the system approach is to clearly state the problem, then proceed to analyze the problem in a systematic manner and derive a solution which is appropriate to that particular and unique problem. The direction of effort then is to:

DEFINE THE PROBLEM ⟶ SOLVE THE PROBLEM

Directions: Using the need which you identified on the previous worksheet, write a Mission Objective which meets the given five criteria. When you feel it is stated satisfactorily, write your final version on the strip transparency provided; be sure to use the grease pencil. In the space below, write your Mission Objective:

System Analysis Workshop
Worksheet 3.2
R. Kaufman, R. Wood

MISSION ANALYSIS--DEFINING THE PERFORMANCE REQUIREMENTS*

The second element in Mission Analysis is to define the Performance Requirements. The ultimate result in the accomplishment of a Mission is the production of a "product." That "product" may be anything: a high school, a curriculum, a behavior change, or even a model by which something could eventually be accomplished or produced. The Mission Performance Requirements provide exactly the criteria by which success or failure of the Mission is measured. They are the following:

1. Product specifications representing terminal success of the Mission Objective.
2. Performance restrictions or limits representing the operational tolerances measuring acceptable final achievement.
3. Performance characteristics and restrictions, including (where applicable) environment, personnel, costs, methods/means and other givens.

The Performance Requirements may include such things as how the product is to perform; conditions under which it is to perform; product design requirements and performance specifications. They tell what the product will look like and/or do.

Let's look at some Performance Requirements. Using the Mission Objective found on the previous worksheet as an example, we might develop the following Performance Requirements:

1. The developed curriculum will cost no more than the current per pupil expenditure.

---

* Adapted from the following source: Kaufman, Roger; Corrigan, Robert; Corrigan, Betty; and Goodwin, Donald, "Mission Analysis in Education" (California: San Mateo County Department of Education, Operation PEP, 1967).

2. The curriculum must be accepted by the Assistant Superintendents of Business and Instruction, the Dean of the Division, and at least 70% of the Typing I instructors.
3. No more than forty students may be in any one section of Typing I.
4. All timed tests will be taken from the standard typing test manual published by X Testing Service in 1971.
5. The typing I course will be open to all students without any entrance requirements.
6. All newly developed materials must have at least a one week field test with current Typing I students.
7. The new curriculum must be completed and in the hands of the stenographic pool by May 1, 1972.
8. The new curriculum will have Performance Objectives for each unit of work, a list of procedures to achieve those objectives, and the criteria by which pupil performance will be determined.

You can see that the Performance Requirements further specify the requirements for completion of the mission. They not only set forth the specifications for the product of the mission, but also serve to specify further the "how much" or "how well" dimension of the Mission Objective. When preparing the Mission Objective and the relevant Performance requirements, it may be helpful to consider that you are writing a contract which will be tested in a court of law. Give the criteria for everything so that there can be no mistake about what is supposed to be accomplished and all of the conditions by which success and failure will be measured.

Directions: Using the Mission Objective you developed on the previous worksheet, write the Performance Requirements which you feel are important in further defining the criteria by which success or failure of the mission is measured.

1. 6.
2. 7.
3. 8.
4. 9.
5. 10.

UNIVERSITY OF CALIF.
LOS ANGELES

OCT 5 1973

CLEARINGHOUSE FOR
JUNIOR COLLEGE
INFORMATION

System Analysis Workshop
Worksheet 3.3
R. Kaufman, R. Wood

MISSION ANALYSIS--DEVELOPING THE MISSION PROFILE*

Thus far, we have identified a need, stated what is going to be accomplished in order to resolve or reconcile the n in the Mission Objective, and identified the Performance R ements of the mission. Attention is now turned to what it takes to get the job done, namely, the Mission Profile. Notice that it states WHAT it takes, not HOW or WHO will do it. Those things which must be done to accomplish the overall job are referred to as Functions. When the major functions of a mission are identified and logically ordered in sequence they constitute the Mission Profile. A Mission Profile, then, can be described as being the major locally sequenced but mutually exclusive Functions which must be performed to accomplish a mission. The Mission Profile represents the critical path for achievement of the end product. The Functions within the Mission Profile may have from two to "X" number of functions, depending on the complexity of the mission. Figure 4 on page 144 of Social and Technological Change: Implications for Education is an example of a possible Mission Profile.

Directions: After having reviewed the attached material on flow-block diagramming, develop a Mission Profile for your Mission Objectives and Performance Requirements. Be sure to identify WHAT it takes to get the job done--not WHO or HOW.

---

* Adapted from the following source: Kaufman, Roger; Corrigan, Robert; Corrigan, Betty; and Goodwin, Donald, "Mission Analysis in Education" (California: San Mateo County Department of Education, Operation PEP, 1967).