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ABSTRACT

A guide to acquiring information needed about postsecondary education outcomes is presented for campus and state-level officials. Attention is directed to: over 200 outcome measures or indicators; standard definitions of each outcome measure; data sources and procedures to acquire data for each outcome measure; and suggestions concerning the potential user for each measure. An index is helpful in locating the measure and topics of interest. Included are guidelines for collecting, processing, analyzing, and using outcomes data and for coding, formating, keypunching/editing, and documenting/storing data. Categories for the outcome measures and procedures include: economics, provision of facility, event, or service; research and scholarship; art form and work; economic access and independence; economic resource, efficiency, and production; aspirations; competence and skill; morale and satisfaction; perceptual characteristics; personality and coping; physical and physiological characteristics; status, recognition, and certification; social activity and role; and student general and specialized knowledge and understanding. Appended are: the Outcomes Structure of the National Center for Higher Education Management Systems; lists of occupations and educational programs, and the Higher Education General Information Survey Taxonomy. (SW)

National Center for Higher Education Management Systems

Postsecondary Education Outcomes Measures and Procedures:

A Sourcebook for Administrative Research

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POSTSECONDARY EDUCATION OUTCOME MEASURES AND PROCEDURES: A SOURCEBOOK FOR ADMINISTRATIVE RESEARCH

(Revision and Expansion of a Field-Review Edition titled Outcome Measures and Procedures Manual)

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1979

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Preface

Identifying, measuring, and analyzing postsecondary education outcomes is a complex and difficult process. It has, however, become an increasingly important process during this last decade, as pointed out by the introductory chapter to this document. Therefore, this sourcebook has been designed to serve as a flexible and practical aid to acquiring the data necessary for obtaining a wide range of information about the postsecondary education outcomes occurring at one's institution. It does this by presenting an array of procedures that can be used by institutional researchers and planners to obtain local data for selected postsecondary education outcome measures (indicators).

This is a revised and greatly expanded version of the NCHEMS Outcomes Measures and Procedures Manual that was published in 1975. That document was developed in two phases. Phase I concerned the identification of those outcome measures most needed by postsecondary education decisionmakers. Recognizing that the NCHEMS constituency at that time was composed primarily of institutional and state-level decisionmakers, the following types of decisionmakers were surveyed to determine the outcome measures they believed would help provide the outcome information they needed for carrying out their job responsibilities.

1. Administrators from community colleges, public and private four-year colleges, and public and private universities. The particular administrators surveyed in these institutions were the president and top-level administrators for academic planning, student affairs, and budget and finance.

2. State directors of higher education and community/junior college governing boards and coordinating councils.

3. State legislators who chaired legislative committees concerned with education and appropriations.

Mailed questionnaires were used in the survey to solicit responses from the different decisionmakers in the sample. The list of outcome measures included in the survey questionnaires was taken from NCHEMS Inventory of Higher Education Outcome Variables and Measures (Micek and Wallhaus 1973).

Phase II was designed to develop operational definitions and data acquisition procedures for the top-priority outcome measures identified in Phase I. Major activities in the second phase included synthesizing procedures being used by institutions or individual researchers to acquire various types of outcome information and conducting special workshops to supplement staff efforts in the development of improved and new outcome measures and data acquisition procedures. Phase II was reviewed and critiqued on an ongoing basis by a task force of ten diverse practitioners in the field (see the acknowledgments section). In addition, the published document was sent to over 800 colleges and universities in the field that were "participants in NCHEMS," which meant that officials at each had agreed to review, critique, and make suggestions for the improvement of newly developed NCHEMS products. Two hundred of the field reviewers received both the Outcome Measures and Procedures Manual and the Higher Education Measurement and Evaluation Kit (a series of questionnaire scales developed and validated, and comparative data gathered, by Robert Pace and his associates at the University of California at Los Angeles).

Not only was the document critiqued by diverse reviewers at all types of colleges and universities, but also by state-agency personnel in a number of

states. In addition, pilot tests of the manual were conducted during 1977-79 by two state systems of colleges and universties and at different institutions in other states. Here was the major test of the feasibility and usefulness of various measures and the specified data acquisition procedures. Another major test was the manual's use in developing the NCHEMS Student Outcomes Questionnaires (which were subsequently revised in 1977-78 to form the basis of the NCHEMS/ CEEB Student Outcomes Information Services [SOIS] program) and their pilot test at a number of colleges and universities.

This current version of the document is based on input from the field review and pilot tests, as well as review of the more recent literature and developmental work in the areas of community impact, research and scholarship outcomes, and student retention and growth. Its development has been overseen by two six-person advisory committees, one concerned specifically with research and scholarship outcomes and one with student and outcomes. In addition, prior to its publication, pertinent NCHEMS staff and a panel of several dozen selected field reviewers reviewed, critiqued, and suggested improvements for the document that were subsequently acted upon.

This document covers 200 measures, more than four times the number of measures that were covered in the initial version. Some of them came from Pace's Measurement and Evaluation Kit, which is out of print and probably will not be reprinted. Many others came from a variety of sources including the published research.

A number of the additions were pilot tested, while many more have not been subjected to such test but rely on face validity and evidence of validity and reliability found by studies reported in the literature. Those measures that have been pilot tested through campus activities supported by NCHEMS

are identified in the comments section of the presentation of each measure in Part III. (They are also identified by asterisks in the overall listing of Part II.)

The new version of this document is also different from the old in terms of its organization and the information provided for each measure. The original version was organized according to the way outcome types were ordered in the NCHEMS Inventory of Higher Education Outcome Variables and Measures, a listing of outcome types (with associated measures) ordered according to the traditional division of higher education activities (instruction, research, and public service). The current document is subdivided according to selected categories of the NCHEMS Outcomes Structure (Lenning and others 1977; Lenning 1977), a comprehensive and generic conceptual and organizational classification of potential and actual postsecondary education outcomes that was developed to replace the Inventory. The sections are ordered alphabetically according to the terms used in the Structure. In addition, general guidelines for collecting, processing, analyzing, and using outcomes data have been made a part of the body of this document. Previously such sections were included as appendixes, but such appendixes were apparently often not noticed by users of the document even though a felt need for such information existed.

The original version of this sourcebook did not have an index. The current version does have an index, however, which should allow users to go quickly and easily to measures and topics of special interest to them. In addition, holes are punched in the pages so that it can be placed in a notebook and helpful materials gathered locally inserted where appropriate.

A final modification of the document that should be mentioned is the inclusion for each measure of some indication of the specific uses of that

measure at the institutional and state levels. Although the pilot test experiences demonstrated the usefulness of a number of specific applications of various measures, it should be made clear that such indications of differential potential usefulness are based largely on logic. Such suggestions were reviewed and critiqued (along with this revised document) by a diverse group of field reviewers, but the empirical validity of most of these assertions remains to be demonstrated. It is hoped that users of this document will let NCHEMS know when such suggestions of applicability prove, or do not prove, out in practice, so that future editions of this sourcebook can be more reality-based.

A common suggestion for improving the manual was to develop comparative statistics for the various questionnaire items suggested. Resources available for the redraft of this document, however, did not allow such normative distributions and statistics to be developed, as desirable as they would have been.

As should be clear by the subtitle and what has been said thus far, this document is intended to serve as a helpful resource for those involved in administrative and policy research, planning, and evaluation at the institutional, consortial, and state levels. It is in particular meant to be a practical and flexible tool of use to those who collect or use information about educational outcomes, who are assisting in the design of such research and evaluation studies. It provides a collection of potentially useful measures, and alternative acquisition procedures for those measures, from which one can choose--and to which one can add one's own unique measures and procedures. At the institutional level, the personnel most likely to find this document of use are: (1) those

who are directors and personnel serving in offices of institutional research or planning, (2) academic affairs vice presidents and mid-level managers, (3) financial affairs vice presidents and mid-level managers, and (4) student affairs vice presidents and mid-level managers. At the state level, administrative planning and budget staff and legislative support staff should also find various measures that pertain to their concerns.

Acknowledgments

Most measures that were in the field-review version of this document have stood the test of time, and thus remain. The field-reviewers and pilot test usage have confirmed the potential usefulness of the measures. Therefore, the task force that provided contributions and critical reviews of that first edition (and their affiliations at that point in time), deserve continued recognition:

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Pilot test activities related to the Outcome Measures and Procedures Manual were coordinated by Sidney S. Micek, with help from staff members Edward M. Cooper, J. Frank Armijo, and Nancy K. Renkiewicz. Appreciation for their cooperation and help in such activities is extended to: Margaret Neil and her former colleagues at Kalamazoo Valley Community College; Dean Hoflund and his associates at South

Dakota State University; Grady Bogue, his staff, and staff members of participating institutions in the State of Tennessee; and Durwood Long and Glenn Miyataki and participating staff at all of the institutions of the Hawaii College and University System. Sidney S. Micek a. ɔ tested out use of the document in condulting with a number of other colleges and universities and in presenting meetings.

Providing continuing, direct input to the development of this revised version, which occurred during 1978-79, were two advisory committees; one concerned specifically with research and scholarship outcomes and the other with student outcomes. The first was also providing advice for development of another NCHEMS document, Research and Scholarship Outcomes: Concepts and Measures, and the second was also assisting with another document, Attrition and Retention: Evidence for Decisionmaking. These two advisory panels are hereby thanked for their excellent work and listed below:

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After its completion in late 1979, a draft of this document was sent for review and critique to several dozen persons in the field who had expressed an interest in this document and being involved in reviewing it. Thanks also to this group, and especially to the following for their helpful input:

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PART I

GENERAL CONCEPTS, PROCEDURES, AND GUIDELINES

Chapter 1

INTRODUCTION

The activities of administrators, faculty, student affairs workers, and others in postsecondary education are all directed toward (some more directly than others) bringing about certain kinds of "educational outcomes." Therefore, it is only natural to wonder if those activities are bearing fruit, and if more effective application of them could result in "better fruit." Funders and overseers of postsecondary education (including community or state citizens, legislators, government officials, alumni, boards of trustees, donors, and foundations), and institutional clients, are wondering the same thing--in terms of whether or not they are getting their "money's worth." The increasing focus on such questions caused a number of people to view the 1970s as an "age of accountability."

In order to evaluate educational outcomes, one needs measures and indicators that can provide evidence about their absence or presence, procedures for using them, and guidelines for applying the assessment information gathered. That is what this sourcebook is all about.

This chapter discusses what is meant by the terms "educational outcomes," "measures," and "procedures." It also outlines the specific purposes of this manual, and how to use it. In addition, the limitations of the manual are presented. Chapter 2 provides discussions about the various administrative needs for outcomes information. Chapter 3 gives general procedures for collecting, processing, interpreting, and applying outcomes data. Chapter 4 provides guidelines for processing and storing data. Finally, the chapters in part III give standard definitions, data acquisition procedures, and suggestions for possible use of selected measures in each of the following outcome areas:

community outcomes; new knowledge, technology, and art-form outcomes; student economic outcomes; student human-characteristic outcomes; and student knowledge and understanding outcomes. The terms for these chapter titles are from the NCHEMS Outcomes Structure (Lenning and others 1977; Lenning 1977), and the chapters are ordered alphabetically. Only a small portion of the Outcomes Structure categories are included in this document, so a different and much simpler numbering system will be used for the measures presented here. There is no relationship between the coding system used here and the one used for the NCHEMS Outcomes Structure.

What Do We Mean by "Educational Outcomes"?

Postsecondary-education outcomes are the end results of the activities and processes that occur within postsecondary-education institutions and programs. As discussed by Lenning and others (1977), they can include the direct results of those activities and processes, plus any short- or long-term consequences of those end results. Thus, we are talking about chains of results or any particular outcome within such a chain. Outcomes can occur during the activities or processes causing them or helping to facilitate their occurrence, or at any point thereafter. Furthermore, once they occur, they may be lasting and of long duration or only temporary and of short duration.

Because it may be difficult to demonstrate empirically that particular outcomes can be attributed to postsecondary education (for example, student outcomes may instead result largely from maturation, postcollege experiences, or off-campus activities), or to particular programs or their activities and processes within postsecondary education, some types of outcomes will often be spoken of in

terms of being possible, potential, or intended. We can also talk about outcomes in terms of whether they are or are not expected to occur. While most educational outcomes are intended, a number clearly occur which are unintended and unexpected "side effects" (sometimes side effects are unintended but expected). Such unexpected and/or unintended outcomes can be seen as positive or negative by different people, and they can be major outcomes that deserve attention.

The terms "outcomes" is generically neutral. It pertains to maintenance (keeping the status quo; stabilization, reproduction, or preservation) or to change (alteration of the status quo; modification, revision, or replacement) in terms of status, condition, product, event, characteristics, presence, or occurrence. However, people attach positive, negative, or neutral value to educational outcomes. Some people will perceive an outcome to be functional and desirable as it pertains to a particular area, while others will see that some outcome as dysfunctional and not desirable or as only functional and desirable in other areas.

Outcomes can be seen in terms affecting or being received by persons, things (such as the environment), groups, organizations, interest-based comunities, geographic-based communities, or aggregate subclassifications of such entities. Lenning and associates (1977) have referred to these as the "audiences" for the outcomes. In this document, outcome measures for two audiences are emphasized: (1) the local community and (2) students. For a particular audience, we can speak of outcomes in terms of types: (1) economic outcomes; (2) human-characteristic outcomes; (3) knowledge, technology, and art-form outcomes: (4) resource and service provision outcomes; and (5) other maintenance and change. The fifth type of outcome is the only one for which no measures are provided.

What Do We Mean by "Measures"?

To measure means to determine or identify the presence and the extent or amount of something, such as an outcome. Some people claim that any outcome can be measured, while others suppose that certain outcomes cannot be measured. Whichever view is held, some outcomes are clearly easier to measure--are more measurable--than others. By measurability, we refer to the extent to which and ease with which a particular outcome can be quantified or made tangible, concrete, and observable.

Evidence or an indication of the presence and amount of a particular outcome is embodied in what is herein referred to as a "measure." Measures can be more or less valid with respect to how much they pertain to the outcome of concern; in addition, some measures are much more reliable or dependable than others (concerning accuracy and consistency of what they show). Often the term measure has been used only in connection with measures of high reliability and validity (such as standardized tests), while other evidences of the presence and amount of an outcome have been referred to as indicators. On the other hand, "measures" have also been commonly used to refer to indicators also, as indicated by the widespread reference to terms such as "unobtrusive measures" and "proxy measures."

As used here, "measures" is seen in the broad context. Any variable or factor that suggests the presence and/or amount of a particular outcome is viewed in this document as a measure of that outcome. Another viewpoint of this document is that multiple measures and data sources are desirable whenever they are feasible in terms of cost, staff time, and ease of use. An exception would be where an extremely valid and reliable measure is being used. Where one measure may be weak (with respect to validity, reliability, and "audience" of concern),

another may be strong, and vice versa. Together they will usually provide a more valid and reliable indication about the presence and amount of a particular outcome, than any one of the measures by itself. If all the measures indicate the same thing, there is probably some assurance about the status of the outcome.

What Do We Mean by "Procedures"?

A procedure is a method, means, or course of action for bringing something about. It is information that tells or instructs us how to do or accomplish something. For each outcome measure included in this document, one or more means of obtaining data for the measure are described. Implementation of these procedures can allow one to acquire the outcome data that are reflective of the expected outcomes of concern.

The procedures provided in this sourcebook are of two types. In part I is provided a number of procedures and guidelines for collecting data in general. For each measure in part III, data acquisition procedures pertaining specifically to each measure are provided. For a number of the measures, alternative data acquisition procedures are presented in order to give the users of this sourcebook as much flexibility as possible in acquiring the data necessary for the measure. For instance, procedures may differ with respect to data-collection mechanisms (institutional records, test instruments, questionnaire surveys, interviews, and so forth) or data sources (exiting students, former students, faculty, administrative staff, and so forth). In cases where questionnaires or interviews are suggested as the data collection mechanism, specific wordings for items or questions to be asked are presented.

When a particular collection mechanism or data source is recommended, it is assumed that the reader knows the general implementation procedures that apply, either through past knowledge and experience or reading part I. It should also be mentioned that this sourcebook has generally steered clear of recommending nontraditional data collection mechanisms. Persons interested in the application of nontraditional methods and procedures to the collection of educational outcomes data are referred to Lenning (forthcoming).

The Purpose of This Sourcebook, and Procedures for Using It

Most decisionmakers concerned with postsecondary education recognize the need for information about the outcomes (results and impacts) of institutions and their programs for purposes of planning, management, and evaluation and also for supporting and justifying long-range plans and budgets. These same decisionmakers are quick to point out, however, the complexities of identifying, measuring, and analyzing postsecondary education outcomes and of incorporating this information into the planning, management, and evaluation process. Although these complexities will continue to plague efforts to obtain and use outcome information, this sourcebook is intended as a step forward in dealing with them. This document does this by presenting an array of alternative procedures for obtainir data related to a variety of potential measures or indicators of the outcomes of postsecondary institutions and their programs that can be useful for: (1) educational planning, (2) institutional research, and (3) program and institutional evaluation. The manual provides:

- A list of postsecondary education outcome measures or indicators that have been identified as relevant to the outcome information needs of institutions and state-level educational decisionmakers.
- Standard definitions of each outcome measure to facilitate communication among decisionmakers
- Specific data sources and procedures that can be used for acquiring data related to each outcome measure presented.
- Specific suggestions concerning who might find each measure of use and when (an index has been included in the back that will allow the user of this sourcebook to go directly to the measures perceived by its developers to be most useful to someone in his or her position).

It was recongized that the outcomes in which one is interested varies markedly from person to person, and thus the attempt was made to cover a wide range of outcome areas found to be important to different people. Information about such interests was gathered through a survey of different users conducted prior to beginning development of the field review edition of this document, and through the field review and pilot tests of the initial document.

It was also recognized that the information about outcomes needed by different decisionmakers in postsecondary education varies considerably as to when it is needed and at what level of detail. Thus, the attempt was made to have the sourcebook be a flexible and adaptable tool from which users can pick and choose the procedures most appropriate for acquiring data related to the outcome measures they need and gather data at the level of detail or aggregation that they need.

As mentioned previously, the remaining chapters of part I provide general data acquisition and use guidelines. Then in part II, all of the measures contained in this sourcebook are outlined. Finally, in part III, ordered series of abstract

sheets that separately present each measure and its related procedures are provided. Each abstract sheet contains the following information:

1. The name of the outcome measure
2. The code number used to categorize the measure
3. A definition of the measure
4. The data sources from which the data needed for the measure can be obtained
5. A listing of the general type of procedures recommended for obtaining the measure
6. Code numbers of suggested data uses (coding key is provided in Fig. 2, p. 10)
7. Comments that may be useful in understanding the use of the measure and its acquisition procedures

A sample copy of the abstract sheet format is shown in figure 1. Following the one-page abstract for each measure, the data acquisition procedures suggested for that measure are presented.

Using this sourcebook should be a fairly straightforward process. Figure 3 outlines the major steps involved. The first step actually does not involve use of the manual at all, but rather is prerequisite to using it--the determination of outcome information requirements. There are various purposes for or reasons why one might be interested in collecting outcome information. Examples include the following (1) the need to assess the extent to which certain institutional or program objectives are being met, (2) the need to answer a particular question related to some problem that must be solved, and (3) the need to be accountable to some external governing or funding body, such as a board of trustees or a state legislative appropriations committee. In establishing the plan for collecting

Figure 1

Sample of the Abstract Formats Used in Part III

Outcome Structure Category 11.2710

N-10
Measure Number

Measure Name

Student sta at withdrawal time

Definition

Characteristics of students that have withdrawn from the institution before completing a program.

Data Sources

Exiting Students, Former Students

Procedures

Administration of a survey questionnaire, exit interviews, search of institutional records.

Uses	Institutional	State

Comments

This measure has been pilot tested.

The purpose of the measure is to describe relevant characteristics of students who withdraw from the institution prior to completion of a program.

Figure 2

POTENTIAL USES OF POSTSECONDARY EDUCATION INFORMATION

A. ACCOUNTABILITY

1. Evaluating institutional and program efficiency and effectiveness
2. Evaluating innovations
3. Faculty and staff evaluation

B. INFORMATION PROVISION AND COMMUNICATION

1. Stimulation of faculty, staff, student and community discussion
2. Recruitment and retention
3. Public and alumni relations

C. GRADING, PROMOTION AND MERIT AWARDS.

D. PLANNING

1. Identification and assessment of student and community educational needs
2. Institutional and program mission, goals, and objectives formulation
3. Decisions about market position, segmentation, and program development
4. Resource and process planning
5. Program and curriculum development
6. Program, course, student life, and faculty life improvement
7. Planning learning experiences

E. POLICY FORMULATION

F. RESOURCE ACQUISITION

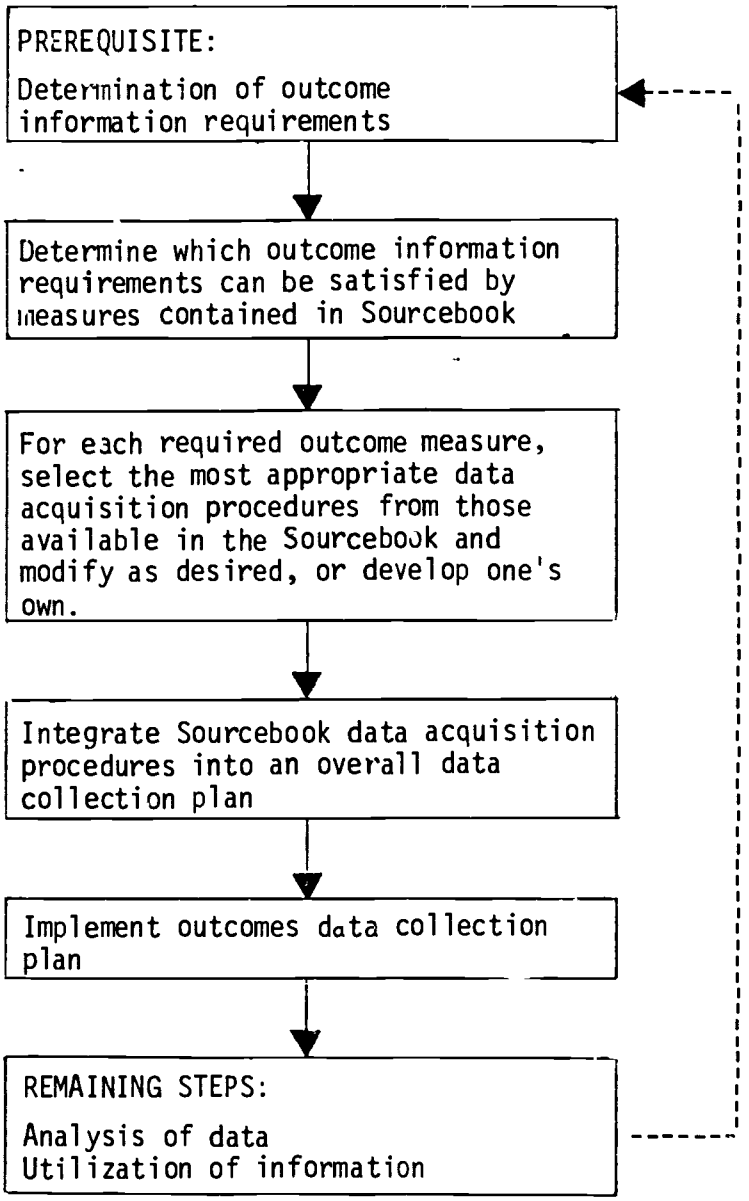
G. RESEARCH

H. STUDENT ASSISTANCE

1. Counseling and advising
2. Diagnosing student problems
3. Appraising student readiness
4. Student placement
5. Job placement
6. Keeping aware of student complaints and concerns, and responding to them

Figure 3

The Major Steps Involved in Using This Sourcebook



the outcome information, the design of the study required by the questions or hypotheses of interest needs to be developed, the sampling procedures need to be determined, and the variables to be measured need to be identified.

It is important that the determination of measures come out of the questions and problem of concern. Sometimes it can be helpful to look at a universe of possible measures, however, and pick and choose. Part II provides such a list. Even more helpful might be to use the index of this document and look up the category that comes closest to the problem and situation of concern. It is important not to limit consideration of measures to only ones that are in this book, however, it was not intended that this document be all-inclusive. Once a person gets started, other measures especially appropriate to the situation are likely to come to mind. Getting one's logic and the "creative juices" started is the most difficult task for many people, and it is hoped that this document can provide some stimulation for this.

Once the outcome information requirements have been identified, the user can begin determining explicitly which outcome measures included in the manual will help in satisfying the outcome information requirement. Even if the manual was used to stimulate brainstorming in the manner outlined above, each of the measures identified there should be carefully considered in the light of its definition.

For each of the outcome measures that help satisfy the outcome information requirements, the user should assess the appropriateness of the data acquisition procedures recommended in the manual. In some instances, the user will have to choose between alternative data collection procedures for an individual measure. While adaptations of the procedures will need to be made for the unique purposes of each study, users' experience suggests that only minimal modifications are

often necessary. For some studies and situations, however, replacements with one's own design is advisable.

In using this sourcebook, it is important to note that the data acquisition procedures presented involve the use of survey questionnaires, interviews, and institutional records. Because it was anticipated that survey questionnaires and interviews will be employed quite frequently, guidelines for developing, administering, and processing survey questionnaires and conducting interviews are presented in chapters 3 and 4 of part I of this manual (pages 00-00).

Although the outcome measures and associated data acquisition procedures are presented individually in the manual, prospective users will most likely use combinations of these measures and procedures because of their wide range of outcome information needs. Thus, the final major step in using the manual is to integrate the selected procedures into the established overall information collection plan. This may include developing an exiting student questionnaire, a follow-up questionnaire for former students, a community input survey questionnaire, a faculty activity questionnaire, and so forth. Once this is done, the user can implement the data acquisition procedures according to the overall plan.

Limitations of the Sourcebook

As with any document of this type, certain limitations are present. The most important limitations of this version of Postsecondary Education Outcome Measures and Procedures are as follows:

1. Some educators feel strongly that breaking the whole picture, such as overall student development into parts or components (such as different kinds of cognitive, affective, and psychomotor development in the case of student outcomes) distorts the total picture--the whole is more

than the sum of the parts. That this is true cannot be denied, but the only way we can analyze and communicate accurately, concretely and meaningfully about such overall or "whole picture" development is in terms of its parts, as inadequate as they may be.

2. The initial version of this source book included only quantitative types of measures, which are helpful and can imply meaning if they are interpreted in context and seen as giving only a distorted view of the outcomes actually occurring (not the precision often implied by specific numbers). The number of quantitative measures has been increased in this area, but an attempt has also been made to include a number of qualitative measures that in spite of their relative imprecision (the state of the art in qualitative measures is still lacking) may be fully as useful and meaningful.
3. The outcome measures included in this manual represent only a subset of all the potentially useful measures of postsecondary education outcomes. Measures that are included, however, are believed to be important and relevant ones for each area.
4. The measures and acquisition procedures presented in this manual generate only outcome information. Although outcome information is basic to effective planning, management, and evaluation, it is important to point out that information about the resources, environments, and processes associated with the institution, program, or organizational unit in focus also is necessary for describing and explaining the outcomes of those entities.

5. Only those outcomes that are measurable or observable, that is, quantifiable outcomes, are included in the manual.
6. The uses suggested for measures are primarily logically based, although the pilot testing and the literature did provide support for a number of them.
7. The data acquisition procedures in the manual deal primarily with institutionally-collected information. Modifications probably will be necessary if the procedures are to be used by persons who are not institutionally based, such as state-level educational planners and decisionmakers.

Chapter 2

ADMINISTRATIVE NEED FOR OUTCOMES INFORMATION

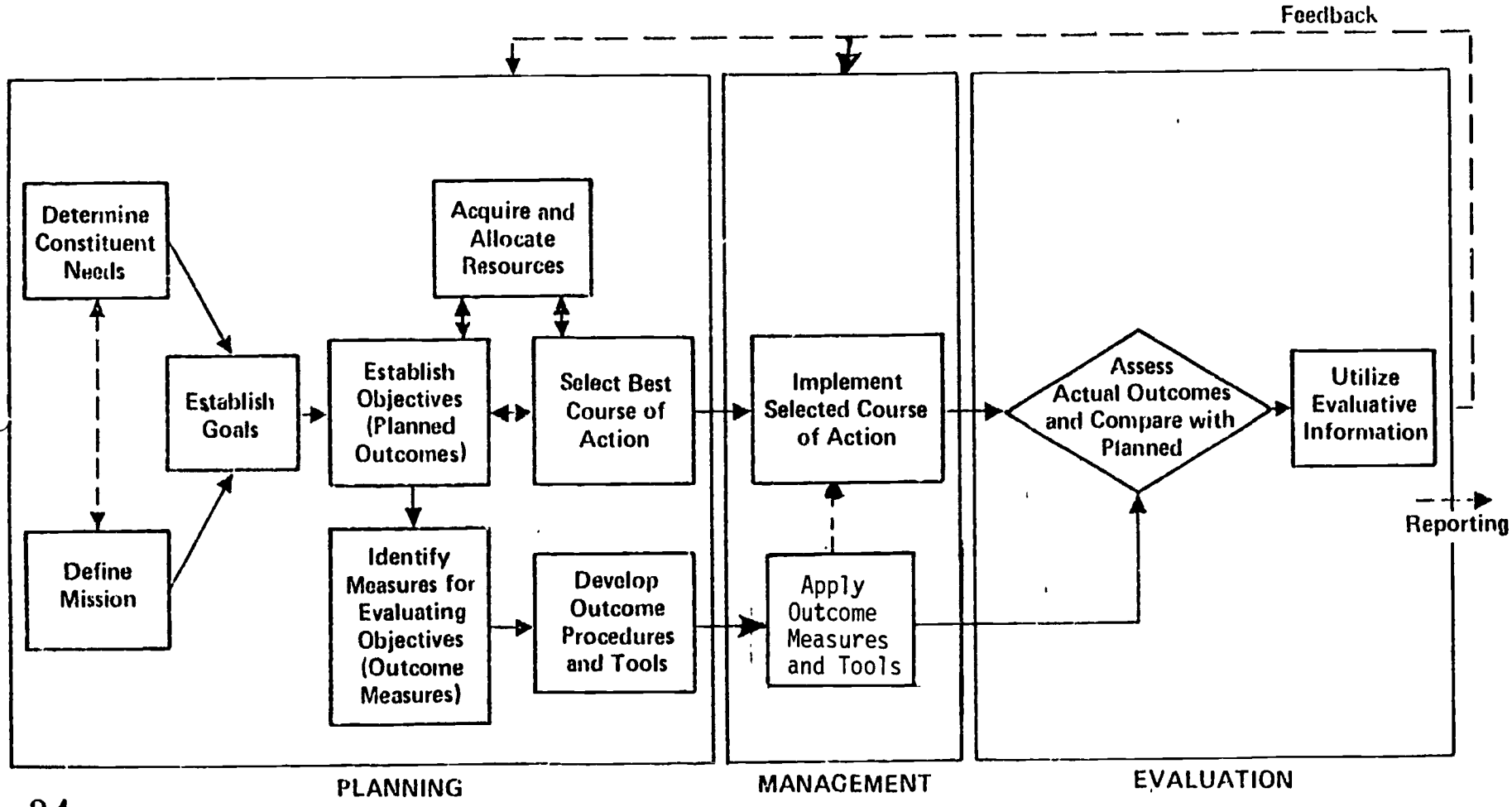
As mentioned in the introduction, educational outcomes are what postsecondary education is all about. All colleges and universities exist, and were funded, to bring about desirable educational outcomes for their students, the local community, and the institutions, agencies, and citizens of society at large. Although certain outcomes such as knowledge and understanding are valued by all, however, the outcomes valued vary from one individual and institution to another. Similarly, subjective perceptions of what is happening with respect to educational outcomes will vary markedly from person to person and group to group, depending on their background experiences, characteristics, values, biases, perceptiveness, and vantage point. For these reasons and others, valid, reliable, and objective information about an educational institution's and program's outcomes is needed. Such information can serve a number of useful administrative purposes.

Its Use in Institutional and Program Planning, Management, and Evaluation

Figure 3 presents graphically a necessarily over-simple and too linear view of planning, management, and evaluation; but one which is adequate for the purpose of this section. This framework can apply either at the system, institutional, or program level. However, the planning, implementation, and evaluation procedures will vary according to the level of focus, which means that the level of focus must be kept clear. In fact, inappropriate planning and data collection have in many cases been undertaken because the level of focus (unit of analysis) was not adequately defined in advance. For example, assessment of the outcomes of

Figure 3

ONE WAY OF VIEWING PLANNING, MANAGEMENT, AND EVALUATION



particular degree programs is impossible unless data are collected in such a way as to permit their disaggregation below the level of the total institution.

Constituent needs are usually spoken of in outcome terms, as a discrepancy between what is desired and what is actually the case. Most needs assessment models that have been developed focus on outcomes information of that type. Once the constituent needs have been identified and assessed, this information is related to (1) evaluative information of what is currently occurring in terms of outcomes and (2) the mission of and values within the unit under focus (system, institution, or program). Through such a synthesis and analysis, goals are established. Goals provide general information about intended outcomes, which is then transformed into detailed, concrete information about planned outcomes (outcome objectives).

Next, the range of alternative courses of action (alternative activities) that the unit in focus might undertake to achieve the desired outcomes is delineated. Included in the identification of the feasible alternatives is the definition of a set of expected outcomes associated with each alternative being considered.

The distinction make in the planning, management, and evaluation cycle between desired outcomes and expected outcomes is an important one. It is intended to make planners focus on what outcomes can realistically be expected from a particular alternative. Too often, planners identify the outcomes that are desired, but never adjust their expectations after selecting a given alternative, which may be designed to produce only part of the desired outcomes because of such factors as resource and environmental constraints.

Once the expected outcomes of each alternative under consideration and the desired outcomes identified in the objective-setting step are determined, they become input to the activity (course of action) selection step of the cycle. In the activity selection step, the set of desired outcomes and the set of expected

outcomes associated with each alternative are compared to one another so that a decision can be made about which alternative will produce the results and impacts that most closely match the desired outcomes. In practice, however, the activity selection decision also must take into account resources and other constraints. Therefore, the expected outcomes of an alternative are likely to be somewhat less ambitious than the desired outcomes.

Once the decision has been made concerning the alternative to be implemented, it becomes possible to determine specific outcome and related data (resource, process, and environmental data) requirements that will be necessary to assess the extent to which the expected outcomes of the selected alternative are accomplished. Resource, process, and environmental data are necessary because outcome data considered in isolation from these mitigating factors may have very little meaning or utility for planning, management, and evaluation purposes.[1]

The management phase of the cycle represents the actual implementation of the selected alternative. At the same time, the process of collecting the outcomes and related data should be undertaken. It is at this point that this sourcebook can play an important role since it provides procedures for acquiring the outcomes data that are reflective of the expected and other outcomes.

After the outcome and related data have been collected, they can be analyzed for purposes of assessing and understanding the actual outcomes that result from the alternative that was implemented. Interest here may center on simple descriptions of the outcomes that result or may concern an explanation of why certain outcomes occurred or didn't occur. Another desirable analytic activity

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[1] NCHEMS Technical Report 35, Program Measures (Topping and Miyataki 1973), can be helpful in identifying the other kinds of data that might be appropriate for interpreting the outcome data that will be collected.

would be a comparison of the actual outcomes with both the desired and the expected outcomes identified earlier. Analysis also may be directed toward prediction of possible future institutional or program performance, and what improvements in the system can be made and how.

Finally, the information that results from the analysis is used as feedback for future planning activities. This aspect of the process is extremely important. Unless the results of the evaluative phase are incorporated into the next cycle, the outcomes data collected often will have served no real purpose.

As inferred previously, the planning, management, and evaluation cycle presented here is conceptual and not operational. Furthermore, viewing the cycle as a strictly sequential process is unrealistic. In practice, it is often necessary to retrace and redo certain steps on the basis of experience later in the cycle. Thus, for example, the objective-setting step may cause some rethinking of the general goals identified earlier in the planning phase.

There are many types of decisions within the management phase that can be also helped by outcomes information and these should be mentioned. One example concerns ongoing operational decisions related to advising and helping individual students and improving student retention. Another example concerns ongoing, operational attempts to improve student life and the campus environment; through responding effectively to what Baird (1976) has called "brass tacks." A third example concerns formulation of day-to-day operational policies.

Its Use in Communicating with Students and Prospective Students

A number of studies conducted during this decade have found that the information that institutions provide to prospective students has often been inadequate or not even provided to them. One of these studies was a large-scale effort conducted

by NCHEMS (Lenning and Cooper 1978), and it determined that this finding pertained to the area of outcomes information more than the others. On the other hand, this questionnaire survey and interviews revealed that students (and other such as high school counselors and parents) considered outcomes information extremely important. More outcome-related information items were mentioned as important than for any other information area.

Enrolled students also undoubtedly need accurate information about outcomes pertaining to their achievements and progress. Such data can serve important motivational purposes, as well as assist them in their ongoing educational and career planning.

The NCHEMS study referred to above also explored how data can be formatted for effective presentation to students. Tabulations were generally the most helpful and script paragraphs (the form usually relied on almost entirely) the least helpful. Furthermore, prospective students usually did not understand some of the terms that we in higher education take for granted, such as "program" and "credit hour." Thus, in addition to making appropriate and meaningful outcomes information available to prospective and enrolled students, care must be taken to communicate such information effectively so that it will reach and be paid attention to by them, and so that it will be timely and meaningful to them.

Its Use in Communicating with the Community and Various Publics

A number of professionals in postsecondary education have called the decade of the seventies the "age of accountability," and with the large decline in the pool of traditional college students scheduled for the 1980s such an emphasis will undoubtedly continue on into the foreseeable future. Thus the book by Bird (1976) that called higher education into question was a sensation. Demands

for accountability are demands for information that documents the benefits received and the college's effectiveness in bringing about outcomes; but the focus is also fully on efficiency and productivity (the relationship of outcomes to the resources expended). Students and the various other clientele and funders of postsecondary education are especially concerned about what they are getting for their money in a time when the costs per student are rising rapidly and the perceived benefits of attending college are decreasing. Illustrative of the thinking in the minds of many citizens during the 1970s was noted economist Milton Friedman's (1977) observation that the total professional staff in elementary and secondary schools went up 8 percent during the previous five years, with per-pupil cost going up 68 percent in dollars and 21 percent after correction for inflation, at the same time that the number of schools and students both decreased by 4 percent. Then he referred to the decrease in SAT scores that continued through the 1970s and concluded that the quality of schooling went down even more drastically than the quantity. His conclusion was that the productivity of elementary and secondary schools had decreased greatly over the previous five years. The same things will be said about postsecondary education during the 1980s unless colleges start doing a better job of documenting outcomes and costs and communicate about these two variables and their relationships effectively.

Its Use at the System and State Level

The uses of outcomes information at the system and state level are generally the same as the uses for individual institutions outlined above, except those uses pertaining to assisting individual students. There is the matter of data aggregation, however, and indexes appropriate only for use at the system level.

Different types of outcomes data collection and analysis will often be needed at the state or system level, however. Furthermore, there are additional problems such as gaining institutional cooperation in the collection of assessment data.

Chapter 3

DEVELOPING AND CONDUCTING INTERVIEW AND QUESTIONNAIRE SURVEYS

Data acquisition procedures and sources are suggested for each of the measures presented in this source book. In most cases alternate procedures and sources are identified, and where feasible in terms of staff time and resources it is often good (especially if one is not fully confident about the reliability and validity of any of the procedures and sources for a particular measure of concern) to have multiple data from different sources for the same measure. Multiple data that indicate the same outcome give added assurance (in terms of increased validity and reliability) that the outcome has in fact occurred or not occurred. On the other hand, collecting outcomes data does take time and money, so one must pick and choose measures and data collection sources and procedures carefully and be realistic in terms of whether the potential benefits from the data are worth the costs of the collection.

The validity and reliability of certain data proposed for different measures are predetermined, such as data collected with standardized instruments (following the instructions provided) and data from student, institutional, or community records. For locally developed instruments and procedures, however, the validity and reliability can vary greatly depending on the care taken in developing them. The two most common locally developed data acquisition procedures suggested are questionnaires and interviews, and items for the measure that can be included in an interview or questionnaire (along with items for other measures) are specified. Those items can be used verbatim or modified as desired or dictated by the situation.

Because of the need to develop and use interview or questionnaire surveys for acquiring as wide a range of information about the outcomes of post-secondary, as proposed in this source book, this chapter was included. Those desiring to develop such surveys who are not experienced in survey development, or who feel the need for a review of good practice in this area, should find this chapter helpful. It is suggested that those who are experienced and knowledgeable about all aspects of interview and questionnaire development should skip this chapter.

The purpose of this chapter is to provide a brief overview of the major steps to be taken in any interview or questionnaire survey effort, and to review some of the key questions that must be considered at each step. Incorporated into the discussion are some "how to do it" suggestions regarding such things as survey design, interview development, questionnaire construction, and report writing. It should be noted at the outset, however, that in no way does this chapter cover all of the things there are to know about survey development and implementation. Rather it is intended to serve as a reminder of the minimum requirements that are paramount in any survey effort. Anyone desiring a more in depth treatment of any aspect of survey development and implementation should see the list of selected references at the end of this chapter.

In some cases it may be felt, concerning the collection of data from students, that students are being "interviewed and questionnaired to death." When this is the case, non-traditional ways of collecting the data can often be used. A large variety of such nontraditional methods for collecting student outcomes data, that have been found effective and feasible for certain situations and kinds of data are reviewed in a forthcoming NCHEMS publication, Student Outcomes Assessment Handbook.

Major Steps and Key Questions

Step 1: Establishing the Purpose of the Survey

As defined by A. N. Oppenheim (1973) a survey is a planned data collection effort for the purpose of description or prediction as a guide to action or for the purpose of explaining the relationships between two or more variables, e.g., the relationship between student academic achievement and student performance on a job. While most survey researchers will attest that in practice there are as many purposes as there are surveys, they also will agree that foremost in any survey effort is the development of a clear definition and understanding of the objectives of the survey. To achieve this end, it is essential that the first step to be taken in a survey is the delineation and clarification of the specific problems to be studied, the critical questions to be answered, and the possible uses to be made of the survey results. The reason this step is so central to every survey is the fact that once this initial step is accomplished, all of the remaining steps in the survey process are "means to an end" and will flow logically from the purpose of the study identified in this step.

In establishing the purpose of the survey, it is important to obtain input from those persons who will use the findings from the study. Of course, the larger the group of persons from which input is sought, the greater will be the diversity of what may constitute the objectives of the study. Generally, the more objectives a study has to accomplish, the greater its complexity and cost. Therefore, it may be critical to set priorities as to the objectives that will be most important to achieve, given certain time and monetary constraints.

In addition to identifying the specific purposes or objectives of the survey in this initial step, two other key questions should be considered:

- What concepts need to be defined before the survey process continues?

  In the formulation of any survey effort, certain concepts are used to communicate and organize one's thinking relative to the problems or questions in focus. For example, in a survey of former students one question of interest might concern their satisfaction with their vocational preparation. What is meant by the concepts, "satisfaction" and "vocational preparation," in this context needs to be translated into specific terms so everyone clearly understands what constitutes the acceptable indicators of these concepts.

- What assumptions will be made?

  In many surveys it is impossible to control all elements of the survey, e.g., the validity of certain parts of a questionnaire or interviewer the adequacy of the respondent sample. Therefore, formulating the assumptions of a survey is an important consideration since they may affect the survey process as well as the interpretation of the survey results.

Step 2: Developing the Survey Plan

Generally speaking, there are four basic purposes of which a survey is carried out:

1. To describe something,
2. To explain something,
3. To predict something, or
4. To explore something.

Very often surveys are designed to meet more than one of these objectives. For example, it is not uncommon to conduct a follow-up study of college graduates to obtain information about their current level of educational attainment and occupational status (i.e., description) and their educational needs now that they have left the institution (i.e., exploration). Once the purposes of the survey have been clearly delineated, the next key step is to develop the plan of action for conducting the study. The most appropriate is the one that ensures a logically tight and efficient plan so that clear answers to the questions or hypotheses of interest can be obtained.

In developing the survey plan the following key questions need to be considered:

- What will be the "units of analysis" under study?

  One of the first questions in laying the plans to be followed in a survey is to determine the "things" under study in the survey. Babbie in his book, Survey Research Methods (1973), has referred to the things under study in a given survey as the "units of analysis." The primary reason it is so important to identify the different units of analysis in a survey is that data will need to be collected to provide information about each unit of analysis identified. For example, a follow-up study of former students (graduates and nongraduates) might be aimed at acquiring information about (1) the marital status of the former students, (2) the salary level of former students who are heads of households, and (3) the mean annual combined income of former students' families. In these examples, the units of analysis would be, respectively, individual former students, former students who are heads of households, and

former students' families. As Babbie (1974: 61) points out,

> Whatever the nature of the data used to describe the units of analysis, it is important that they be identified in advance. Otherwise the sample design and the data collection methods may prohibit the analysis appropriate to the study.

- What types of survey design will be needed?

Having determined the purposes and the units of analysis for the study, the next key concern is selecting the design for the study. The best design is the one that arranges the conditions for data collection and analysis in such a way to "combine relevance to the research purpose with economy in procedures" (Selltiz, Jahoda, et al, 1951). As a result, survey designs will differ depending on the purposes of the study and the time and monetary constraints.

In determing the best design for a given survey, three basic types of design can be considered:

1. A Cross-Sectional Design--a plan for collecting data at a given point in time to describe, explain, predict, or explore certain aspects or relationships about a larger population at that point in time.
2. A Longitudinal Design--a plan for collecting and analyzing data over multiple points in time to describe, explain, predict, or explore changes in a given population over time.
3. Combination Design--in this plan, data are collected on a broad range of variables to provide cross-sectional baseline data for the incoming population of students (for example,

freshmen) and selected longitudinal data are collected for a smaller sample periodically over the duration of the period of concern (for example, from entrance at freshmen to graduation or dropout). Furthermore, at the end of the period the new incoming population of students is assessed in a cross-sectional manner so that adjustments can be made for any influencing societal change occurring during the period.

There are variations to both of these basic designs that can be considered. For instance in a longitudinal study, a decision might have to be made about whether to study the same sample of a given group of students over time or to study different samples of a given group of students over time. The references presented at the end of this appendix under the heading "Study Designs" provide extensive discussion about the strengths and weaknesses of different design alternatives.

- Should a sample be drawn?

A survey sample represents a subgroup of elements (e.g., a small group of students) that has been selected from a larger population (e.g., all the students enrolled in the college) for the purpose of finding out something about the population from which they have been taken. Most survey efforts in postsecondary education require some type of sampling. The reasons for this are threefold. Probably the most obvious reason is that it is less expensive to survey a sample of a large population. A second reason for sampling is that it saves a great deal of time in terms of data collection and data processing. The final major reason for sampling is that it is

usually more efficient than a survey of the entire population since it allows for the development of higher quality instruments and the data collected are more manageable.

- What kind of sample should be selected?

Basically, two types of samples can be considered: (1) probability samples and (2) nonprobability samples. The important difference between these two types of samples is that probability samples are based on the use of random sampling in the selection of elements from the larger population.

In choosing between these two basic types of sampling approaches, one needs to assess the advantages and disadvantages of each. Probability samples are intended to avoid biases in the selection of the elements of the population by making sure all elements have an equal chance of selection. Such a guarantee allows the researcher to assume that the sample will closely resemble the population. A second advantage of probability samples is that they permit estimates of sampling error. Nonprobability samples, on the other hand, are apropos when probability sampling is too expensive or when it is impossible to apply the random selection process because the elements of the population cannot be enumerated.

Some important varieties of probability samples include simple random samples, stratified random samples, and cluste samples. Variations in nonprobability samples include quota samples and purposive samples. Detailed discussion about these sampling alternatives can be found in the references suggested under the heading "Survey Sampling" at the end of this appendix.

- How large should survey samples be?

While the size of a sample(s) depends on a number of factors, generally it should be large enough to obtain a sufficient number of responses to make some reliable conclusions. According to Kish (1965:217):

> Exact control of sample size is unnecessary and impossible in most situations. It may be too difficult to obtain either the information or procedures for firmly controlling even the initial sample size. Moreover, nonresponses and subclasses introduce additional sources of variation. We should aim at an approximate control that is both feasible and desirable. The degree of control depends on the situation. . .

Because the answer to this key question depends on the situation at hand, any further discussion here may be more confusing than helpful. As a result, one should consult the selected references on Sampling Methods presented at the end of this appendix.

Step 3: Developing the Survey Questionnaires

Because the use of self-report survey questionnaires is suggested so often throughout Sections II, III, and IV of the manual as the best means for collecting many of the outcomes measures listed therein, the following discussion focuses on key questions related to the development of this type of data-gathering instrument.

- How should the questionnaire be designed?

The format of any questionnaire should be attractive to the respondents. This is a most important ingredient in achieving a high response rate.

The following is a list of suggestions for making a questionnaire attractive:

1. Keep the questionnaire as brief as possible.*
2. Use quality paper and printing whenever possible. Make sure the printing is not too small for the respondent to read.
3. Design the cover of the questionnaire so that it is distinctive, aesthetically appealing, and simple to read.
4. Make it easy for the respondents to record their answers.
5. Have a logical and easily followed order and organization of questions. For example, provide clear instructions when subsequent questions are contingent on an earlier question(s).
6. Present the questions so that plenty of "white space" shows between the items (don't clutter the questionnaire).

A final point to be considered in questionnaire design is how the questionnaire will be coded once it is returned. For example, if the responses are to be keypunched directly from the questionnaire, the developer will need to make sure the keypuncher can easily and reliably recognize the number or alphabetic character assigned to the questionnaire items and their associated response options.

*In a situation where the number of questions to be asked of respondents is lengthy, one may want to consider giving parts of the questionnaire to different samples of the same population in order to keep reasonable the length of the questionnaire that anyone has to answer. A term that has been assigned to such a procedure is "matrix sampling."

(A good rule to follow is have the draft of the questionnaire reviewed by a data processing expert to make sure it can be efficiently and accurately keypunched.)

- Should open-ended or closed-ended items be used?

The decision about whether or not to use an open-ended item (in which the respondent supplies his or her own answer), a closed-ended item (in which the respondent selects his or her answers from the list supplied by the investigator), or both types will depend on the type that best serves the purpose(s) one has in mind. Whitney (1972) has listed the following advantages for each type of item.

The advantages of open-ended items are that they:

1. Are subject to little influence of the investigator.
2. Elicit a wide variety of responses.
3. Are useful for introducing subjects of new parts of the questionnaire.
4. Provide background for interpreting results.
5. Give respondents a chance to "have their say."
6. Are more "courteous."
7. Can aid in drafting questions and coding responses (when used in pilot work).
8. Give "sparkle" and credibility to your final report.

On the other hand, the advantages of closed-ended items are that they:

1. Are interpreted more uniformly by respondents.
2. Produce easily tabulated responses.
3. Are unaffected by the respondent's verbosity.

4. Eliminate some problems of vocabulary and definitions.

5. Allow more questions to be asked.

- How should questionnaire items be worded?

The wording of questionnaire items is extremely important to ensure that the respondents will be willing to and capable of answering them in an honest and accurate way. This means that the items must be clear and unambiguous so the respondents understand exactly what the investigator wants to know. To achieve this objective, the following points should be considered:

1. To the extent possible, items should be kept short. Items that are too long often will cause the respondent to forget the purpose of the questions in focus. Further, lengthy items can cause fatigue and impatience among respondents which, in turn, may affect questionnaire reliability and response rate.
2. In writing the items, keep the language simple, clear, and straightforward. A good rule to follow is write the item so that the respondent feels you are treating him or her with respect and courtesy.
3. To the extent possible, items should be stated in the form of simple sentences rather than in the form of compound or complex sentences.
4. Caution should be taken to avoid biased words or phrases that may influence a respondent to answer one way or another.
5. If questionnaire items offer alternative responses to be checked by the respondent, the set of responses should include all possible and distinct responses to the question in focus to avoid confusion (i.e., the set of responses should be exhaustive and mutually exclusive).

6. The need to avoid "double-barreled" questions is another important consideration in item wording. For example, asking respondents to agree to disagree with statements such as "Micro University should continue to strive for excellence in the liberal arts and excellence in its career-oriented programs" should be avoided. Some persons may not be able to respond because they might favor an emphasis in the liberal arts curriculum but be violently opposed to any career-oriented curricula or vice versa. Furthermore, if they did answer, the responses of such persons would be misleading. Babbie (1973: 142) suggests that whenever the word "and" appears in a questionnaire item, the item should be checked to determine if it is a double-barreled one.

In developing the questionnaire items included in the Outcome Measures and Procedures Manual, these guidelines have been taken into consideration. However, as modifications are made to these items or new questions are added, the guidelines pertaining to question w. ing should be reviewed.

- How should the items be sequenced?

The sequence in which questions appear on a questionnaire is always significant since it not only adds to the attractiveness of the instrument but also sets the tone for responding to the questionnaire. As a general rule of thumb it is suggested that a questionnaire should begin with a set of questions that will be most interesting to the respondent. That is, they should make the respondent want to answer them. Often questions concerning attitudes and satisfaction can serve this purpose, while questions regarding demographic variable will not.

A second rule to follow in the sequencing of items is to group the items that deal with the same topic.* For example, on a former student questionnaire, questions concerning educational progress and plans could be one grouping and questions about occupational status and plans could be another grouping.

A final consideration concerning item sequencing is that some people feel that items which are more difficult to answer should be toward the end of the questionnaire unless they are crucial for setting the tone or introducing the substance of the questionnaire.

- What kinds of instructions should be included in the questionnaire?

The instructions contained in a questionnaire are especially important for directing the respondent through the body of the questionnaire and for establishing and maintaining rapport with the respondent. Instructions within the questionnaire also will help the respondent understand the purpose of the order of questions and make more sense out of the questionnaire as a whole. For example, in introducing a series of questions that are designed to determine students' job career plans, it can be beneficial to preface the series with the statement:

> "The following four questions are intended to help us learn about your current and long-range occupational career plans and activities."

*After this rule has been considered, it might be good also to group according to item format type, e.g., all items on a particular topic that are "sentence-completion" should be grouped together.

- What kind of introductory cover letter should accompany the questionnaire?

  The letter that accompanies the questionnaire is also important for establishing rapport since it serves to introduce the total survey and its purpose. Very often the introductory letter is the key device that motivates the respondent to complete the questionnaire. Generally, the more personal you can make the cover letter, the greater will be your chances of achieving a high response rate.

- What pilot testing of the questionnaire will be conducted?

  Ideally, a pilot test (preliminary tryout) of the total survey should be conducted. Such a pilot test would include testing the sample design, the questionnaire, the data gathering and processing procedures, and the data analysis to be carried out. At a minimum, a pilot test of the questionnaire to be used in the study should be conducted. Furthermore, the pilot version of the questionnaire should be to the extent possible an exact replica of the questionnaire that is intended for the actual study. If a final version of the questionnaire has not been decided on, then alternative questionnaires should be tried out on different pilot samples. In this way, pilot test respondents will be reacting to the version that is likely to become the final instrument.

Step 4: Collecting and Processing the Survey Data

This major step involves the administration (assembly and distribution) of the questionnaires and what should be done with them once they are returned. Key questions associated with this step are the following:

- How will the questionnaire and its accompanying materials be assembled and distributed?

In conducting a self-report questionnaire survey, special attention must be given to the distribution and collection of the questionnaires for the purpose of ensuring a high response rate. The method for administering a questionnaire that most often is employed involves the assembly of (1) the questionnaire, (2) an introductory letter, and (3) a return postage-paid envelope. An alternative method is the development of a self-mailing questionnaire that requires no return envelope. This type of questionnaire is constructed in such a way that the return address and postage are printed on the questionnaire, and, therefore, the respondent can return it without the use of an envelope. (See alternative #3 for Outcome Measure I-8 in Section IV of this manual for an example of this latter alternative.)

A major drawback of this latter method is that it may place too much responsibility on the respondent who may not be willing to spend a great deal of time in preparing the questionnaire for its return (e.g., using a stapler to seal the questionnaire). Also, special post office requirements concerning the size and form of materials that can be mailed may cause unforeseen problems. Possibly the best suggestion that can be given is that no matter which method is used, you should assess what approach will be most acceptable to the respondents and also will meet the requirements of the postal authorities.

It should be noted that for surveys of current students and faculty/staff, non-mail methods may be appropriate for distributing self-report questionnaires. For example, questionnaires can be administered to

faculty at faculty meetings, to current students at the end of a class or in their living units, and to graduating students when they register for graduation. The major advantage of this method is that it offers greater control over questionnaire response rate and allows for oral clarifying information to be provided to the respondents. A problem can arise with this method if the respondents feel they are being hurried or imposed upon. Therefore, it is important to be sure the respondents do not feel they are being forced in any way to complete the questionnaire.

- How will the returned questionnaires be monitored?

The monitoring of returned questionnaires is another major concern in carrying out a survey since it sets the stage for data processing and, subsequently, data analysis. The following strategy has been suggested by Babbie (1973) for dealing with this issue:

> First, prepare two return-rate tables. The first table should identify the number of questionnaires returned each day from Day 1 (the date the questionnaires are mailed) to the day that is the designated cutoff date for returned questionnaires. The second table should identify the cumulative number or percentage of the questionnaires that were returned. Again, start with the day the questionnaires were mailed as Day 1 and end with the designated cutoff date for the returned questionnaires. The advantages of these two tables are that (a) they allow you to keep track of response rate to the mailed questionnaires, (b) they provide ready-made tables that could be included in the study report, and (c) they identify the size of the follow-up mailing that will be necessary.

Once the two return-rate tables have been prepared, assign identification numbers to each of the questionnaires as they are returned. These identification numbers should be assigned serially. Such numbers can be valuable in estimating non-response biases in the survey. Babbie (1973) presented the following example to illustrate the utility of using these numbers:

> If grade-point average (GPA) reported by students decrease steadily through the data collection, with those replying right away having higher GPA's and those replying later having lower GPA's, then the research might tentatively conclude that those who failed to answer at all have lower GPA's yet.

In giving this example Babbie cautions, "While it would not be advisable to make statistical estimates of bias in this fashion, the researcher could take advantage of approximate estimates."

- What follow-up procedure needs to be used?

Everything that has been suggested up to now concerning the development and administration of survey questionnaires has focused on the objective to obtain an acceptable response rate. However, almost every survey, no matter how carefully it has been planned and the materials have been developed, needs a follow-up design. The primary reason for this is that a high response rate ensures that the sample of actual respondents approximates the larger population and, therefore, valid conclusions can be made about the findings.

Generally, the follow-up design will call for the use of (1) a reminder letter or postcard, (2) a follow-up letter and a questionnaire, (3) a telephone follow-up, or (4) combinations of these three techniques.

The exact follow-up procedure selected will depend on the situation at hand. However, several general suggestions are important to keep in mind:

1. Make sure the follow-up is properly timed. Usually, there is a two week interval between the initial contact and the follow-up contact.
2. Make sure the nonrespondents can be identified at each stage of the follow-up. One way that has been found useful in keeping track of nonrespondents in mail surveys is to produce three sets of stick-on address labels. The first set can be used for the first mailing. When questionnaires are returned, the address label for the respondent can be removed from the second set of labels and placed on the questionnaire for identification purposes. Then when the follow-up mailing is scheduled, the remaining labels of the second set can be used to address the envelopes or postcards. The third set is then used to identify those who return questionnaires after the follow-up mailing and those who do not.
3. Develop a return-rate graph to assess the effects of the initial contact and subsequent follow-up contacts.

- What will be an acceptable response rate?

As mentioned above, an acceptable response rate is important so valid conclusions can be made about the results. In mail surveys related to postsecondary education, response rates vary from 30 to 80 percent depending on the type of respondents. For example, a much lower response rate can be expected in dropout studies than in other kinds of outcome studies.

A common procedure for computing the response rate is as follows:

1. Identify the initial size of the sample.
2. Subtract the number of persons in the initial sample who did not receive questionnaires from the total number of persons in the initial sample.
3. Divide the number of persons who returned completed questionnaires by the net number who received questionnaires. The percentage that is obtained identifies how successful the survey was in getting people to participate.

For those persons who did not respond it is always a good idea to check if there was a response bias (i.e., to determine if only a certain type of person responded or did not respond).

- How should the data be processed?

This question focuses on how the data will be coded, edited, formatted, and eventually stored (filed). Because of the importance of these considerations and the confusion that often surrounds them, a detailed discussion of a set of rules in this area is presented in Appendix E.

Step 5: Analyzing the Survey Data

This step is designed to determine what the data collected in the survey actually mean. The following two key questions need to be considered in this step:

- What statistical techniques are needed to analyze the data?

The overall purpose of statistical analysis is to link the data back to the questions or hypotheses that motivated the study in the first place. In analyzing survey data, two basic types of

statistical treatments of the data can be employed: (1) descriptive statistics and (2) inferential statistics. Descriptive statistics are appropriate when there is an interest in an accurate description or picture of the data. Generally, three methods can be used to achieve this objective:

1. Description of the distribution of the data through the use of frequency distributions and percentages.
2. Description of the central tendency of the data through the use of means, medians, and modes.
3. Description of the variability of the data through the use of standard deviations and ranges between the data.

Inferential statistics should be applied when the questions or hypotheses of the study call for drawing inferences or testing conclusions, or generalizing about the data. According to Hillway (1969) inferential statistics are intended to answer questions like the following:

- What is the probable accuracy (i.e., reliability) of the measurements?
- To what extent does the situation described by the data differ from what might be arrived at through mere chance?
- To what extent is there a relationship between two or more factors or variables dealt with in the study?

Useful guides for selecting the appropriate statistical methods to be applied in a study have been prepared by Tatsuoka and Tiedeman in

N. L. Gage's Handbook of Research on Teaching (1963) and by Siegel in his book on Nonparametric Statistics for the Behavioral Sciences (1966).

- Will a statistical computer program be used to analyze the data?

A variety of statistical computer program packages have been developed to aid researchers in the analysis of large amounts of data. Three of the more well-known statistical packages used in analyzing survey-type data are:

1. SPSS--Statistical Package for the Social Sciences by N. H. Nie, D. H. Bent, and C. H. Hull, McGraw-Hill Book Co., New York, 1975.
2. BMD--Biomedical Computer Programs by W. J. Dixon (Ed.), University of California Press, Berkeley, 1973.
3. OSIRIS III by Survey Research Center ISR, University of Michigan, Ann Arbor, 1973.

When considering the use of these statistical packages it is important to keep in mind: (1) their ease of use, (2) their availability to the researcher, and (3) the availability of the specific statistical analytic techniques in the statistical package.

Step 6: Reporting the Survey Results

This step is intended to help communicate the survey findings in a logical, clear, and accurate form. In short, it is the step in which the data are finally prepared in a form that they can be used in the decisionmaking process. Key questions to be considered in this step include the following:

- Who will read and use the report?

Having a clear understanding of who will read the survey report is extremely important for effectively communicating the results of the study. Very often different audiences will be interested in the findings.

As a result, drafts of the survey report will have to be appropriate for different levels of interest in the report and different levels of sophistication among the various readers.

- Will there be more than one report?

In many cases a variety of reports will be developed that vary in form (oral and written) and length. For example, a lengthy written report that describes the study procedures followed and presents the finding in detail will probably need to be prepared for the sponsor of the research. Often a shorter, more compact version of the full report will be needed to summarize the study and its findings for those persons who do not have time to read the full report and who are less interested in the various nuances and details of the study.* This shorter version of the report will quite often be more widely read and quoted. Therefore, it is important to select carefully the critical aspects of the study to be communicated in the report and to do so in a form that is attractive and easy to understand.

- What tables, charts, and figures will be most useful in communicating the results of the study?

Much thought should be given to how the data and results of the statistical analysis will be communicated in the reports. In choosing the types of tables, charts, graphs, and so forth to be used, it is a good idea to consider how familiar the audience is with statistical

*For survey findings to have maximum impact, it will also be desirable to prepare even shorter special reports for groups of decisionmakers having different concerns. The reports prepared for particular decisionmakers should focus only on those findsings of importance to them.

concepts and presentations. Also it is good to remember that "a picture is worth a thousand words" if it is a good one. (A good reference on characteristics of tables, charts, and figures can be found on pages 38-53 of Glass and Stanley's book, Statistical Methods in Education and Psychology, 1970.)

- When will the report be needed?

Although this is the last key question presented in this chapter, it is equally, if not more, important than all the other questions. Survey efforts are usually undertaken in postsecondary education institutions to provide information for decisionmaking purposes. As a result, if the report is not available when it is needed, then all the time and energy that has been put into it has gone for naught. For this reason, it is important in planning the survey to develop an activity-time flow chart that specifies when each milestone has to be met.

A Final Comment

Obviously, the discussion presented in this chapter provides only a thumbnail sketch of the major steps and key questions to be considered in the questionnaire survey process. It is hoped, however, that comments and suggestions which have been made about these steps and questions will serve as a set of minimum guidelines for ensuring the appropriate and useful application of the data collection procedures presented in this manual.

To aid in further inquiry about the various components of the survey process mentioned in this appendix, a set of selected references follows.

Chapter 4

DATA PROCESSING GUIDELINES: CODING, FORMATTING, EDITING, DOCUMENTING, AND STORING DATA

As indicated in chapter 3, even those designing a study who will not be involved in processing the data will need to consider data processing needs carefully in their design of (1) the questions to be spoken to by the study, (2) the sampling plan and procedures, (3) the data collection and recording instruments, and (4) the analyses to be specified. It is important for study designers to have some understanding of data processing concepts, needs, and capabilities even when data processing experts are available to provide consultative input. The study planner's study design must be communicated to the data processing expert in a way that the expert can relate his/her processing knowledge and skills to the study most effectively and efficiently. In return, the study planner must be able to understanding study-related problems being communicated by the consultant.

In many cases, even in large institutions, those designing studies will also be the ones who plan, coordinate, and carry out the data processing activities. The need for such a person to have an understanding of data processing concepts, procedures, and guidelines should be apparent. One would be surprised at how may times one who decides to conduct an administrative study lacks data processing knowledge, either through lack of training and experience or because former knowledge has been forgotten through lack of use. There have been numerous instances where persons have conducted hand tabulations and analyses--even though computer processing would have saved much time, effort, and expense--solely

because they knew little or nothing about data processing, were afraid to ask for assistance from available others having such knowledge, or did not know whom to ask for help.

Because of the aforementioned needs held by many who conduct the type of research that this sourcebook is intended to assist, data processing concepts and guidelines are presented in this chapter. Even those completely uninitiated to data processing should be able to gain enough of an understanding that they can communicate effectively with a processing consultant, find meaning in the instructional materials for "canned" computer programs such as Statistical Program for the Social Sciences (SPSS), and prepare data for simple computer analysis. Of course, those proficient in data processing should bypass this chapter.

Overview

Most data collection efforts proceed through several major stages: a design or planning phase, a collection or implementation phase, an analysis phase, and, finally, a report-writing phase. Frequently, little attention is paid to the development of sensible coding and data formatting rules. It is the contention here that a considerable amount of money and effort could be saved on many data collection projects by the application of a few common-sense rules or guidelines for transcribing the data from raw response form to computer-readable cards, tape, or disc.

The intent of this chapter is to provide some rules or guidelines for those involved in the processing of data in preparation for computer analysis. (Some of the rules relate primarily to the problems associated with survey or questionnaire data, but most are simply standard, common-sense procedures applicable to the processing of any input documents.) Throughout the chapter, several central themes are expressed:

- The loss of information should be minimized between the raw document and the computerized form of the document
- Errors in transcribing the data should be minimized
- The programmer's problems in working with the data should be minimized (This does not mean that the number of programs should necessarily be minimized, but that decoding, subscripting, formatting, and other data-handling problems should be kept to a minimum.)
- The number of decisions by coders and keypunchers should be minimized, that is, any data manipulation that can be done on the computer should not be done by hand

This chapter is not intended as a guide to good survey design, although many of the suggestions given here are related to the design of questionnaires and interview instrument design, and should be taken into account when planning the instrument. Neither is this chapter concerned explicitly with data analysis, though again, there should be an interaction between data analysis and data transcription considerations.

There are numerous examples of time and money lost because of poor coding schemes, both in very large data collection efforts and in small, one-person efforts. The guidelines which follow are an attempt to present some common-sense rules to use in coding data, deciding on a format for the data, and editing, storing, and documenting the data for further use. Adherence to these guidelines should ensure that the data will never have to be repunched and that what is punched will be a complete and accurate representation of the raw data.

The remainder of this chapter is organized into six sections: (1) important terms; (2) coding guidelines; (3) data formatting guidelines; (4) keypunching and editing guidelines (5) documentation and data storage guidelines, and (6) summary. Within the last five sections, a number of rules are included for ensuring proper data transcription. Each rule is accompanied by a rationale explaining its purpose. Where appropriate, examples are included and in some cases, exceptions to the rule. The rules, and the pages to go to for an explanation of specific rule, are listed below:

Page

Important Terms

Since this chapter is written specifically for those inexperienced in processing data, certain terms important for developing an understanding of data processing are presented in this section. These terms will be used, or an understanding of them assumed, in the data processing rules and regulations presented in tne remaining sections of this chapter.

Alphabetic Codes - Codes that contain any letters from the alphabet or punctuation (except the decimal point or plus or minus signs).

Alphanumeric Codes - Codes that contain alphabetic characters, numeric characters, and/or punctuation.

Blank - Code used to indicate missing data; a blank card column is one that contains no punch.

Card - A data storage medium; each card contains 80 columns.

Card Number - Code used when there is more than one card per respondent to indicate the sequence of cards within ID numbers.

Categorical Variable - A variable which has discrete responses; i.e., the response can be placed in one of several categories; e.g., curriculum is a categorical variable which might have two responses: academic and nonacademic.

Character - One numeric digit, alphabetic character, or punctuation mark.

Code - The numeric (or occasionally alphabetic) representation of responses; e.g., the codes for male and female might be designated as "1" and "2", respectively.

Coder - The person who examines documents, assigning codes to responses where necessary, before documents are keypunched.

Column - One of 80 positions on a card. Also means one position on the data format for cards, tape, or disk.

Continuous Variable - A variable which can take on any value within a specified range; e.g. annual salary is a continuous variable that can take on values from zero to infinity (theoretically).

Data Field - See field.

Data Set - See file.

Disk - A data storage medium, similar to tape in terms of usage.

Editing - The process of checking coded data on cards, tape, or disk against the raw data (e.g., questionnaire) to correct errors that occurred during transcription.

Execution of a Program - The actual running of a program through the computer.

Field - The columns allocated on the data format to one variable; e.g., the ID number might occupy four columns: these four columns are referred to as the ID field.

File - Any set of computerized data that logically belongs together; e.g., all the punched cards from a questionnaire administration might be called a file.

Listing - A computer-produced paper copy of the data.

Missing data - Responses left blank by the questionnaire respondent, or data which are unobtainable.

Numeric Codes - Codes which contain only numbers (the digits zero to nine) with or without a decimal point or a sign (plus or minus).

Output - The results obtained from the running of a program.

Package Program - Any of a number of previously written computer programs available to perform data analysis and manipulation.

Print-out - Output on paper.

Punch - The square holes on a computer card designating numeric and alphabetic codes in each column of the card.

Record - The set of data fields connected physically (all fields on one card) or logically (all fields for one respondent).

Response - The answer given to an item or the information recorded for a particular variable; e.g., a questionnaire item that asks, "What is your sex?" has two possible responses: male and female.

Format - A written description of all variables in a data record, their location (column positions), and codes for categorical variables or ranges for continuous variables.

ID Number - The unique identifying number for every respondent for which there is a card or data record.

Item - One question on a survey or questionnaire.

Job - A computer run. See execution of a program.

Keypunch - The machine that punches cards for computer input or the process of punching data onto cards.

Keytape - A keypunch-like machine that produces computerized data on tapes instead of cards.

Leading Zeroes - Zeroes punched in the left-most columns of a numeric field when the datum to be punched does not fill the entire field; e.g., ID number one punched as "0001" has three leading zeroes.

Lay-out - See format.

Left-justify - Punched data beginning in the left-most column of the field; e.g., the name "JONES" in an eight column field, left-justified, is punched "JONESbbb," where "b" means a blank column. Left-justification is used for alphanumeric data.

Sequence number - See card number.

Subscript - A number associated with a categorical variable that designates response codes; e.g., the variable 'sex of respondent' might have responses designated S_1 and S_2 to indicate male and female.

Tape - A data storage medium for the computer.

Transgeneration - The process of converting one type of code to another; e.g., (a) the continuous variable, salary, might be transgenerated so that there are three salary categories: high, medium, and low; (b) a variable coded as "1", "2", "3" might be transgenerated so that the codes are "3", "1", and "2", respectively.

Verification - The process of checking punched cards (or tape) for accuracy. Sight verification is done by hand and machine verification is done by the keypuncher with a special verifying keypunch.

Zero-fill - An instruction to the coder or keypuncher that leading or trailing zeroes are to be punched or coded in numeric fields.

Guidelines for Coding Data

1. Rule: Do not assign a code of zero to responses, particularly categorical responses (see two exceptions below).

   Rationale: Many computer languages cannot distinguish between zeroes and blanks; thus, special machine language programs may be required for this purpose. Also, package programs (e.g., SPSS, BMD) frequently have been written to accept categorical data input as integers beginning with "1". Finally, most computer languages do not allow a subscript of zero; thus, the programmer must remember to add "one" to all categorical variables that can have a value of zero before using the variable as a subscript.

   Example: The two responses YES/NO should be coded 1 = Yes and 2 = No or vice versa, <u>not</u> 0 = Yes, 1 = No.

   Exceptions: Assign a value of zero to a continuous variable that has a natural zero point (i.e., the number zero indicates the absence of any quantity of the variable). An example of a questionnaire item for which a code of zero makes sense is the number of visits to a doctor in the past week. The other exception to Rule 1 is in scoring tests with right and wrong answers. Traditionally a wrong answer is coded zero and a correct answer coded as a "1", though there is no compelling reason for this coding scheme.

2. Rule: Assign numeric codes to categories; do not use alphabetic codes to indicate responses to variables.

Rationale: Computers operate on numbers: any alphabetic codes must first be translated into numbers before being tabulated, used as subscripts, or arithmetically manipulated. It is easier and less costly in the long run to have numbers translated into the alphabetic code they represent (when necessary for labelling purposes) than to translate alphabetic codes into numeric codes.

Example: The two responses YES/NO should be coded 1 = Yes and 2 = No, <u>not</u> Y = Yes and N = No.

Exceptions: Information for printing, labelling, or addressing purposes such as name of respondent, address, etc., can and should be stored as alphanumeric characters. A variable such as home state of respondent should be punched as a number if any tabulations will be performed using that variable for grouping purposes.

3. Rule: Missing data values (the response left blank) should be coded as blanks (the card left blank in appropriate columns).

Rationale: Most packaged programs are designed to eliminate missing data (coded as blanks) from computations at the option of the user. The use of a missing value code other than a blank will require extra cards or statements in running these programs. It also makes good sense to try to code the data for computer usage exactly like the original raw data as much as possible.

Example: A missing achievement test score for a student respondent should be left blank on the appropriate card or tape columns; the card columns should not be filled with zeroes or some other missing value code such as 999.

4. Rule: Don't punch or code decimal points (or other punctuation such as "$", commas, etc.).

Rationale: This rule has a number of justifications: (a) computers do not use punctuation (except the decimal point) such as "$" or commas; therefore, extra programming is required if any punctuation is punched; (b) decimal points are acceptable as computer input but not required; since decimal points take up extra space on the card, require extra time to punch, and can be indicated easily at the time of execution of the program, it is not recommended that they be punched. Also, it sometimes is necessary to move the decimal point in a number for

analysis in a particular program (if the program has a maximum or minimum range for variables); this can easily be accomplished if the decimal is not punched, but requires a special data transgeneration step if the decimal has been punched.

Example: Data such as 98.112, 31.006 should be coded and punched as 98112, 31006. Data such as $21,340.31 should be punched simply as 2134031.

5. Rule: Don't change uncategorized data into categories, combine one or more responses into one code, or collapse categories of responses into smaller number of categories at the time of coding or punching.

Rationale: It is not difficult in a computer program to combine or aggregate responses from cards or tapes. It can be costly and time consuming, however, for a future user of the data or the current user to decide that the unaggregated or uncombined responses are necessary to analyze the data properly and, therefore, have to recode and repunch some of the data. There is also a greater possibility of error in the punched cards or tape if a coder or keypuncher is asked to mentally combine or transcribe responses while recording or punching them.

Example: A questionnaire item with the fourth and fifth responses listed as "not applicable" and "don't know," respectively, should be coded separately as "4" and "5", even if the current analysis plans are to combine the two responses. Another example is an item that asks for the respondent's annual salary. Even if it is planned that only three categories of salary will be used for analysis (e.g., high, middle, and low), the original salary or categories of salary should be coded and punched.

6. Rule: Use identical codes for all items in a questionnaire with the same responses.

Rationale: It will be easier for all persons working with the data to remember the numeric codes for responses if there is uniformity throughout the questionnaire or document to be punched.

Example: Throughout the questionnaire or document, code Yes/No as 1 = Y, 2 = N (or vice versa, although 1 = Y, 2 = N is probably easier to remember). This rule applies particularly when most items on a questionnaire list "yes" as the first response, followed by "no", but a few items list these two responses in reverse order. The rule also applies in the case where some of the items have an additional category such as "don't know" which should be assigned a code value of "3", even though "don't know" may be listed as the first response.

Exceptions: If a questionnaire contains several Yes/No responses and some items with an additional category such as "uncertain," that logically falls between "yes" and "no", it is better to code 1 = Y, 2 = U, 3 = N. The rationale for this exception is that the response "uncertain" is logically between the responses "yes" and "no" on a scale of how certain the respondent is about the question asked. This exception does not imply that other items in the questionnaire or document with only two responses (YES/NO) should then be coded 1 = Y, 3 = N (see rule 8). As is explained in the next rule, it is important that numeric codes correspond to any underlying scale in the responses.

7. Rule: Numeric codes for categorical responses should correspond to implicit ordering of the responses.

Rationale: Frequently, statistics such as the mean and standard deviation are required for categorical variables that have some underlying continuum. If the numeric codes for the categories have been assigned and punched logically (i.e., according to the implicit ordering of the responses), no recoding will be necessary to compute such statistics. It is also easier to remember the meaning of numeric codes for categories if they have been assigned according to a logical ordering scheme.

Example: Responses to an item on a questionnaire might be (a) high, (b) low, and (c) in-between. According to rule seven, the numeric codes assigned should be Low = 1, In-between = 2, and High = 3. Thus, the low category is assigned a low number, and also the assigned numbers correspond to the implicit ranking of the categories.

Note: If the questionnaire has been written as described in the above example, neither the coder nor the keypuncher should be asked to perform the rearrangement of the codes to correspond to the implicit ranking of the categories; rather, a simple transgeneration computer program should be run to assign the number codes to the proper responses. The coder or keypuncher should simply code or punch 1 = high, 2 = low, and 3 = in-between so that transcription errors will be minimized.

8. Rule: Code values assigned to response categories should be consecutive integers ranging from "1" to K, where K is the number of categories.

Rationale: For most computing purposes, computations, cost, time, and confusion will be minimized by assigning consecutive integer values to categorical responses. See also the rationale for rule 2.

Example: For a questionnaire item with three possible responses: (a) never, (b) three times a week, and (c) six times a week, assign codes of one, two, and three rather than zero, three, and six to the responses.

9. Rule: Where possible, assign standard codes to questionnaire responses.

Rationale: The use of standard codes (where they exist) will facilitate any comparisons between the analytic results of the current study with past and future studies using the same data items.

Example: A data item for which numeric codes are needed might be the state in which the respondent lives. Clearly, every data collection effort in which this information is gathered could assign codes from one to 51 to the various states in the United States, but a more sensible approach is for all data collectors to use the same codes. Thus, one should search through previous literature or other sources to find an existing coding system for states in the U. S. Other examples are the coding of occupation, education, ethnic group, college major field, etc.

10. Rule: Always assign a numeric identification (ID) number and sequence number to every card in the data set so that each card has a unique number identifying its sequence.

Rationale: There are several reasons for this rule: (a) if the cards get dropped, or out of sequence, ID numbers and card sequence numbers on each card make it easy to put the cards back in their proper order; (b) For some purpose, it may be necessary to create a file of, say, the fifth card for each respondent; (c) Supplementary data may need to be merged with each respondent's previous data.

Example: A questionnaire administered to 1300 respondents might require 149 card columns to punch all the responses. Four-digit ID numbers should be assigned to all persons and punched on all cards, and (since two cards will be required per respondent) card numbers (one and two) should be assigned and punched on each card. Thus, the card sequences should look like: 10011, 10012, 10021, 10022, etc.

Note: (a) ID numbers are often assigned beginning with 101 1001, rather than 001, 0001, etc. This practice is generally a good one in that it sometimes requires extra programming effort to print ID numbers with leading zeroes (i.e , "001"

will usually be printed as "1" by the computer). Keypunchers, also, must be instructed to punch leading zeroes. Beginning the ID numbers with a "1" eliminates this problem. (b) It is generally a good idea to include a sequence number in the format, even if there is only one card per respondent, to facilitate adding additional cards for each respondent in the future.

11. Rule: The ID number should be the first set of data on each card, followed by card or sequence numbers (within ID numbers), followed by frequently used respondent information, with data responses appearing last on the card(s).

Rationale: This rule is based partly on tradition and partly on experience. Since the ID number and card numbers are frequently used pieces of information, placing them first on each card saves time for the data user or programmer. The same reasoning follows for such information as sex, ethnic origin, curriculum, grade level, and other common grouping variables. If a number of computer runs are to be made, particularly on lengthy data records (several cards per respondent), it is easier for everyone involved in the analysis or programming to look for commonly used information on the first card, rather than having to find respondent's sex on card two in column 59 and respondent's grade level on

card five, column 31, etc. Hopefully, the questionnaire or data gathering instrument has also been organized with important categorical variables listed first.

Note: As in the note with rule 7, if the questionnaire has not been organized as described in this rule, do not ask the coder or keypuncher to perform the rearranging of the data. A separate program should be run after the key-punching stage to accomplish this.

12. Rule: The data format or lay-out should be organized in the same order as the questionnaire responses except where a conflict exists with rule 11.

Rationale: If the punched data format is in the same order as the raw data, it will facilitate the process of referring back and forth between the data gathering instrument and the data format.

Example: The format for a questionnaire with three parts should be arranged so that responses to the three sections are in the same order in both. Responses should also be in the same order on both documents within sections of the questionnaire.

Exceptions: Rule 11 should supercede this rule where there is a conflict between the two guidelines; i.e., if the questionnaire has been arranged such that certain important grouping variables (such as sex of respondent, grade level, etc.) are buried in the middle of the questionnaire, it is better to place them toward the beginning of the format, out of the order in which they were placed on the questionnaire.

13. Rule: A data field, such as card sequence number or ID number, which appears on every card per respondent should be located in the same columns on each card.

Rationale: A data field, such as ID number or card number, that must be examined across cards (either by hand, using the card sorter, or in a program), is extremely difficult to work with or use if it is not punched in the same columns on every card.

Example: If the ID number on card one is 1332 in columns one through four, then card two should also contain the ID number in columns one through four and similarly for the card sequence number in column five of both cards; e.g., columns 1-5 of card 1 should contain 13321, and card 2, 13322.

14. Rule: In general, card columns should be filled, starting with column one, without spaces (blank columns) between the variables.

Rationale: This rule is more of a guideline than a rule, and the user must decide whether to follow it or not. There are two reasons for following this rule: (a) inserting extra blank columns between variables may mean that more cards per respondent are necessary than the minimum required by contiguous, consecutive data. (This situation is particularly a problem if two cards per respondent are required rather than just one, since one card per respondent is much easier to deal with than two or more.) (b) If new data are ever added to the original, it is easier to add them to the remaining right-most columns of the card format, than to add another card to the format or change the card format and compress the original variables together.

Exception: When sight verifying of the cards is planned or there are very few variables, separating variables by one or two blank columns can be helpful for distinguishing fields.

15. Rule: Never assign more than one response to each column or position in the data format.

Rationale: Multiple punches in the same column always require specially written decoding programs to read the data. Any savings in formatting space gained by multiple punching will be lost in time and money required to read multiple punched data.

Example: A questionnaire item requesting the respondent to "circle th choices" should be formatted with three columns, one for each possible choice of the respondent.

Guidelines for Keypunching and Editing Data

16. Rule: When sending cards to be keypunched or keytaped, request that the cards be verified.

Rationale: Verifying cards or tapes costs about twice as much as simply having the cards punched but helps insure greater punching accuracy.

Exceptions: If, for some reason, a small number of punching errors are acceptable, or if the number of cards to be punched is few enough that a sight check of accuracy can be performed, card or keytape verification is unnecessary.

17. Rule: When giving the data to the coder or keypuncher, include very specific and precise instructions about the format

and the coding scheme. Instruct the coder or keypuncher to call or ask about any questions he/she has and to set aside those documents about which there are unanswered questions.

Rationale: Frequently, questions arise during the coding or punching phase about which the data user must make decisions and must be aware. Without specific instructions to call about questions, some keypunchers and coders will simply make their own decision and continue.

18. Rule: Before setting up a data format and deciding on coding schemes, examine the responses to a few of the returned questionnaires.

Rationale: Very often unusual or unexpected responses appear, particularly on questionnaires; examination of a few returned questionnaires before designing a format or setting up coding schemes will help insure that the "strange" responses can be accommodated by the data format and response codes.

19. Rule : Before finalizing the plans for the format and code values for the data, discuss both with someone who is familiar with the kind of analysis programs that are or may be required.

Rationale: A data processing person (may be a research assistant, programmer, systems analyst, etc.) can often spot potential problem areas in either the format for the data or in particular choices for coding responses.

20. Rule: Always make some kind of data editing check as the first step after the punched cards or keytape have been returned.

Rationale: Without fail, some errors will occur in the process of transcribing raw data to tape or cards; therefore, at a minimum, before doing any analysis, a computer run should be made that prints out-of-range responses for all variables and checks for duplicate ID numbers and card numbers. (If the number of cards is small, the editing check can be done by hand.) Examination of this output should point out errors where the data were out of the acceptable or reasonable range and where ID numbers were mispunched. Other errors, such as coding or keypunching errors where digits are reversed or mispunched within the acceptable range are harder to find: (a) If the data set warrants the procedure, there are a number of schemes for creating "check digits" to detect certain types of transcribing errors; (b) One can also check by hand a random sampling of questionnaires against the corresponding punched cards or tape records to estimate the error rate for all questionnaires,

and simply report these values in the summary document for the study.

Note: Data transgeneration or rearrangement tasks (see rules 7 and 11) can be combined with the data editing run so that all three are accomplished in one program.

21. Rule: Edit the entire data field for a variable; do not edit each column separately within the data field.

Rationale: Fewer errors will occur and less editing checks will be required if each variable is edited as a field.

Example: The variable, SAT verbal score (range 200 - 800), should be edited as one field to check for scores less than 200 or greater than 800. This variable should not be edited as three columns, the first ranging from two to eight and the second and third ranging from zero to nine.

22. Rule: As a general rule, numbers should be punched right-justified and alphabetic characters punched left-justified.

Rationale: The term right-justified means that the data are punched all the way to the right in the field (e.g., if columns 21 through 23 contain a code for curriculum, then curriculum

code "1" will be punched as bb1 rather than 1bb, "where "b" means a blank column). Left-justified is the reverse of right-justified (i.e., the name "Jones" in an eight column name field would be punched "JONESbbb" instead of bbbJONES"). Alphabetic characters are normally used for printing and labelling purposes where it makes sense to punch the data as we read, from left to right. Numbers, on the other hand, are usually used for computations, in which case it makes sense to punch them the way we would write them to add up a column of figures. Also, "1bb" would be read by the computer as "100" without special instructions to the contrary.

23. Rule: As a general rule, request that the keypuncher precede numeric fields with zeroes (zero-fill) when the number to be punched does not fill up the entire field.

Rationale: Keypunching accuracy, rhythm, and speed will be increased if each field requires the same number of punches for all respondents.

Note: Alphabetic or character fields (left-justified) should be punched with blanks in any columns remaining in the field to the right of the punched data.

24. Rule: After the keypunching and after the final editing phases, obtain a listing of the raw data for documentation and reference purposes.

Rationale: There are many times during the data editing and even the analysis phase of a project when it is necessary to refer back to the raw data. The cards could be used for this purpose, but a paper listing is easier to handle, and does not jeopardize the order or the condition of the cards.

Note: If the complete set of data is extremely large (so that a complete data listing would be cumbersome and require a large volume of paper), a listing of the first 100 records or every Nth record is still recommended (where N is selected so that 100 to 200 records are printed). When all the editing and modifications to the data are completed, a complete listing should then be obtained for documentation and reference purposes.

Guidelines for Documenting and Storing Data

25. Rule: Document, in writing, all phases of the coding, punching, formatting, and editing steps.

Rationale: It is easy to forget, even after three or four weeks, why a decision was made or what the decision was. It is a good idea to make notes through the entire data transcription process of why and what decisions were made. Particularly important is a careful, up-to-date set of documentation on the data format and coding assignments. If very extensive data editing is necessary, it is also important to document any editing rules and any changes made to the original punched data.

26. Rule: After any important (costly) change in the data, immediately make a duplicate copy of all the data for storage separately from the working copy of the data.

Rationale: If the data are stored on cards, problems can occur such as the cards being dropped, torn by the card reader, sorter, etc., or simply lost. If the data are stored on tape or disk file, the tape can be misplaced, and both tape and disk files can be inadvertently scratched (erased) Thus, it is important, no matter what storage form is used to keep a duplicate copy of the data. This rule applies primarily to three key points in the data transcription process: (a) after the data have been received from the keypunching area; (b) after any costly computer run creating new or modified data; and (c) after the data have been edited and finalized.

Note: For long-term storage of important tapes, one copy of the data should be stored in a location such that a fire or other damage in one area would not destroy the second copy of the data. For short-term storage, cards should be stored packed tightly together in an upright position (without rubber bands), preferably in a file made for storing cards. Cards should be read to tape for long-term storage.

27. Rule: When storing tapes or cards, write all identifying information on the tape label or cards and, if possible, store identifying information with the data.

Rationale: After a short period of time, unlabelled tapes or cards are difficult to identify; it makes good sense to write on the cards (across the top of the deck or on the first card) or attach a label to the tape specifying all identifying information. A copy of the data format can also be folded and stored next to the cards or inside the tape cover. The identifying information should include: (a) creation date, (b) description of data, (c) sequential run or data set number, and (d) all information required for using the tape or cards.

Note: When storing cards, it is a good idea to put a diagonal line across the top of all the cards (with a felt-tip pen) and to write "F/C" and "L/C" on the first and last cards, respectively.

Summary

Preparing a good data file from raw input data is an important and often neglected phase of any effort involving data collection. By following the guidelines given in this paper, it is hoped that some of the problems that occur in preparing a data file can be avoided. It is obvious from the rationale for many of the rules given here, that creating a good set of computerized data is, to a large extent, a matter of applying common sense: thinking through how the data will be used, who will use the data, and what form of the data will be required for current and future analyses: in short, preparing for multiple contingencies.

For quick reference, the rules have been listed again below in abbreviated form:

1. Do not assign a code of zero to responses, particularly categorical responses.
2. Assign numeric codes to categories; do not use alphabetic codes to indicate responses to variables.
3. Missing data values should be coded as blanks.
4. Don't punch or code decimal points (or other punctuation such as "$", commas, etc.).
5. Don't change uncategorized data into categories, combine one or more responses as one code, or collapse categories of responses into smaller number of categories at the time of coding or punching.
6. Use identical codes for all items in a questionnaire with the same responses.
7. Numeric codes for categorical responses should correspond to implicit ordering of the responses.

8. Code values assigned to response categories should be consecutive integers ranging from "1" to K, where K is the number of categories.

9. Where possible, assign standard codes to questionnaire responses.

10. Always assign a numeric identification (ID) number and sequence number to every card in the data set so that each card has a unique number identifying its sequence.

11. The ID number should be the first set of data on each card, followed by card or sequence numbers (within ID numbers), followed by frequently used respondent information, with data responses appearing last on the card(s).

12. The data format or lay-out should be organized in the same order as the questionnaire responses except where a conflict exists with rule 11.

13. A data field, such as card sequence number or ID number, which appears on every card per respondent should be located in the same columns on each card.

14. In general, card columns should be filled, starting with column one, without spaces (blank columns) between the variables.

15. Never assign more than one response to each column or position in the data format.

16. When sending cards to be keypunched or keytaped, request that the cards be verified.

17. When giving the data to the coder or keypuncher, include very specific and precise instructions about the format and the coding scheme. Instruct the coder or keypuncher to call or ask about any questions he/she has and to set aside those documents about which there are unanswered questions.

18. Before setting up a data format and deciding on coding schemes, examine the responses to a few of the returned questionnaires.

19. Before finalizing the plans for the format and code values for the data, discuss both with someone who is familiar with the kind of analysis programs that are or may be required.

20. Always make some kind of data editing check as the first step after the punched cards or keytape have been returned.

21. Edit the entire data field for a variable; do not edit each column separately within the data field.

22. As a general rule, numbers should be punched right-justified and alphabetic characters punched left-justified.

23. As a general rule, request that the keypuncher precede numeric fields with zeroes (zero-fill) when the number to be punched does not fill up the entire space.

24. After the keypunching and after the final editing phases, obtain a listing of the raw data for documentation and reference purposes.

25. Document, in writing, all phases of the coding, punching, formatting, and editing steps.

26. After any important (costly) change in the data, immediately make a duplicate copy of all the data for storage separately from the working copy of the data.

27. When storing tapes or cards, write all identifying information on the tape label or cards and, if possible, store identifying information with the data.

PART II

OVERALL LISTING OF MEASURES INCLUDED

Community Outcome Measures and Procedures

A. Economic Outcome Measures

A-1 Annual income according to amounts of college education

A-2 Occupational access of women and minorities according to amounts of college education

A-3 Geographic mobility of college graduates compared to those not attending college

A-4 Use of college experience for screening and hiring

A-5 College impact on employee absenteeism and tardiness

** A-6 Institution's purchase of locally delivered goods and services

** A-7 Institution's capital equipment expenditure relevant to the local community

** A-8 Institution's capital construction expenditure relevant to the local community

** A-9 Local expenditures by faculty and staff

** A-10 Local expenditures by students

** A-11 Local expenditures by visitors

A-12 Occupational level and advancement

A-13 Payment of individual local and state taxes by college graduates compared to others

A-14 Contribution to community attractiveness for employers

** A-15 Institutions payment of local and state taxes and box compensations

** A-16 Institution's purchase of locally provided utilities

** A-17 Employee productivity as related to college

B. Facility and Event Provision Measures

B-1 The annual number of people attending athletic, cultural, or other events provided and/or sponsored by the institution

** B-2 Community participation in an institution's social, cultural, and recreational programs

B-3 The number of column inches of newspaper coverage received by institutional events in local, regional, and national newspapers

B-4 The number of institutional facilities made available to the community and the financial investment that the institution has in these facilities overall and in each

** B-5 Community use of institutional facilities

C. Service Provision Measures

C-1 Enrollment of regular degree/diploma/certificate students from the community

** C-2 Enrollment of non-degree and non-certificate seeking students

** C-3 Community participation in community education programs

** C-4 Community participation in educational extension programs

** C-5 Educational goals achieved by community participants

* C-6 Community awareness and use of, and satisfaction with, instructional programs

* C-7 Community awareness and use of, and satisfaction with assistance services

* C-8 Community unmet educational needs

C-9 Amount of advisory and analytic assistance provided by the institution to community agencies and citizens

C-10 Amount of advisory, referral, and analytic assistance provided by institutional staff and students outside

C-11 Amount of treatment and care service provided to the citizens of the community

C-12 Number of enrolled students employed by community firms during the time that they are still students

* C-13 Institutional goal attainment

C-14 Students enrolled in an organized educational activity for no credit

NEW KNOWLEDGE, TECHNOLOGY, AND ART FORM MEASURES AND PROCEDURES

D. Research and Scholarship Outcome Measures

** D-1 Research proposals funded

** D-2 Research Restricted Revenues

D-3 Books authored/coauthored by faculty and former students

D-4 Books edited by faculty and former students

D-5 Chapters or readings in books by faculty and former students

D-6 Journal articles authored or coauthored by faculty and former students

D-7 Citation index applied to faculty and former students

D-8 Periodicals edited by faculty and former students

D-9 Selections to editorial boards of faculty and former students

D-10 Papers published in professional association proceedings by faculty and former students

D-11 Papers presented at professional meetings by faculty and former students

D-12 Informal/unpublished papers by faculty and former students

D-13 Number of patents and copyrights granted to faculty and former students

D-14 Number of dissertations supervised by faculty and former students

D-15 Awards to faculty and former students from professional associations

D-16 Offices held in professional associations by faculty and former students

D-17 Number of visiting scholars or researchers

D-18 Honorary degrees awarded to faculty and former students

D-19 Number of fellowships awarded to faculty and former students

D-20 Number of endowed chairs

D-21 Number of faculty and former students invited to make presentations to professional and other meetings

D-22 Number of faculty and former students invited elsewhere to be visiting professors and scholars

D-23 Number of faculty and former students serving on special invitation commissions, councils, study teams, or committees of experts

D-24 Number of faculty and former students listed in American Men of Science, Who's Who, and other such works

D-25 Amount of use or application received by technological products developed

D-26 Assessed economic valuation of the technological products developed

D-27 Assessed social impact of technological products developed

E. Art Form and Work Outcome Measures

E-1 Number of art works or performances completed

E-2 Number of art works entered into formal local, state, and national competitions

E-3 Number of art works or performances commissioned by others

E-4 Number of awards and recognitions received in artistic competitions

E-5 Amount of awards and recognitions received outside of artistic competitions

E-6 Number of invited showings and displays of art forms and works

E-7 Number of artistic auditions, recitals, and public performances

E-8 Ratings and recognitions received by reviewer critics

E-9 Number of by-line credits to one's name

E-10 Number of times one is interviewed by the press, radio, or TV because of one's artistic production or renown

E-11 Being on the social register because of one's artistic production or renown

E-12 Having a biography written about one because of artistic production or renown

E-13 The amount of money that one's art works or performances will attract on the open market

E-14 Being recognized as one who initiated a new art form or style

STUDENT ECONOMIC OUTCOMES

F. Economic Access and Independence Measures

** F-1 Student success in obtaining <u>first</u> job after leaving the institution

** F-2 Student success in obtaining preferred first job

** F-3 First job earnings

** F-4 Annual total income of former students

F-5 Discrepancy between current and desired socioeconomic level for former students

F-6 Self-report of perceived economic security and the contribution of college to that security

F-7 Geographic dispersion and mobility of graduates

G. Economic Resource, Efficiency, and Production Measures

G-1 Amount of absenteeism and tardiness on the job among graduates

G-2 Percentage of graduates employed in management positions

G-3 Percentage of graduates who as a result of attending college can do their own income tax forms, legal contracts, typing, etc.

G-4 Percentages of graduates involved in consultative activities for a fee

G-5 Perceived effect of college on efficiency, production, and motivation on the job

STUDENT HUMAN CHARACTERISTIC OUTCOME MEASURES AND PROCEDURES

H. Aspirational Outcome Measures

** H-1 Students seeking additional degrees and certificates

** H-2 Highest degree or certificate planned

** H-3 Change and stability of career goals

H-4 Change in reported aspiration for graduate school

H-5 Change in reported interests and likes or dislikes

H-6 Score or change in score on interest inventories

H-7 Score or change in score on need for achievement and achievement motivation scales

H-8 Self-report of perceived change in motivation or drive level

I. Competence and Skill Measures

I-1 Student success in passing certificatic and licensing examinations

I-2 Score or change in score on a study skills test

I-3 College GPA

I-4 College persistence

I-5 Score or change in score on a test measuring citizenship and family membership skills

I-6 Score or change in score on a test of creativity and original thinking

I-7 Score or change in score on a test measuring the ability to communicate or express oneself

I-8 Score or change in score on a test that measures the ability to analyze and solve problems and to make inferences

I-9 Score or change in score on a test that measures leadership and interpersonal ability

I-10 Score or change in score on a test measuring specialized skills required for a particular occupation

I-11 Score or change in score on tests that measure physical and motor skills

I-12 Expert judges' ratings based on direct observation of student performance on competencies of concern

I-13 Proficienc and contest awards in areas such as leadership, communication, athletics, etc. that depend on the competencies of concern

I-14 Self-report in an open-ended manner or using rating scales of one's proficiency in particular areas

J. Morale, Satisfaction, and Affective Outcome Measures

** J-1 Student satisfaction with overall educational experience

** J-2 Student satisfaction with vocational preparation

* J-3 Student satisfaction with college services

J-4 Student success in obtaining a job

** J-5 Student satisfaction with knowledge and skills in the humanities

** J-6 Student satisfaction with critical thinking ability

** J-7 Student satisfaction with human relations skills

** J-8 Job satisfaction

J-9 Student postgraduate satisfaction with life in general

J-10 Score or change in score on an attitude scale

J-11 Score or change in score on an instrument that assesses values

J-12 Score or change in score on an instrument that assesses beliefs

J-13 Score or change in score on an instrument that measures socialization, mores, and standards of conduct

J-14 Appreciation of different cultures and a wide range of human values

J-15 Self-report of attitudes, values, and philosophy of life

J-16 Religious or ethical organization memberships, participation, and support

J-17 Observed objectivity or subjectivity and emotion guiding one's standards of conduct

J-18 Amount of openness and acceptance of one's feelings

J-19 Self-report of one's feelings, emotions, and affective disposition

K. Perceptual Characteristic Outcome Measures

K-1 Score or change in score on a self-concept scale

K-2 Amount of self-regard and self-confidence

K-3 Amount of sensitivity to the needs and emotional cues presented by others

K-4 Amount of alertness to the opportunities confronting one

K-5 Observed amount of respect for others and their ideas

K-6 Whether one sees things as all "black and white" or complex grays

K-7 Self-report of one's view of self and of others

L. Personality and Personal Coping Characteristic Outcome Measures

L-1 Score or change in score on an instrument that measures adventurousness and initiative

L-2 Observed frequency of speaking out on issues

L-3 Score or change in score on an instrument that measures autonomy and independence

L-4 Score or change in score on an instrument that measures dependability and responsibility

L-5 Score or change in score on an instrument that measures amount of dogmatism, authoritarianism, and open-mindedness

L-6 Score or change in score on an instrument that measures flexibility and adaptability

L-7 Score or change in score on an instrument that assesses one's habits

L-8 Score or change in score on an instrument that measures psychological functioning

L-9 Score or change in score on an instrument that measures amount of tolerance and persistence

L-10 Self-report about change in personality and personal coping characteristics as a result of college

L-11 Observation by others of change in personality and personal coping characteristics

M. Physical and Physiological Characteristic Outcome Measures

M-1 Score or change in score on a physical fitness test

M-2 Medical doctor's health physical examination report

M-3 Self-report of health and how well one feels physically

M-4 Score on tests designed to measure physical physiological characteristics

N. Status, Recognition, and Certification Outcome Measures

** N-1 Program completers during a certain time period

** N-2 Program completers who entered as transfer students

** N-3 Degrees and certificates earned by an entering class of students

** N-4 Time to program completion for a graduating class

** N-5 Time to program completion for an entering class

** N-6 Entering program dropouts

** N-7 Students working toward and receiving another degree or certificate

** N-8 Student ability to transfer courses

** N-9 Level of achievement of former students in another institution

* N-10 Student status at withdrawal time

* N-11 Reasons for students withdrawing from the institution before completing a program

N-12 Term and course completion percentages

N-13 Self-report of personal goal attainment status

N-14 Reasons for attending college related to persistence/ withdrawal status

N-15 Credit hours completed

N-16 GPA

** N-17 Employment in major field of study

N-18 Being accepted for entrance to graduate or professional school

N-19 Score on graduate school exams

N-20 Graduate school grades

N-21 Being selected by the civil service, if applied

** N-22 Student success in passing certification and licensing examinations

N-23 Social and professional awards and listings

N-24 By-line credit for a movie, play, book, article, etc.

N-25 Employer's rating of overall on-the-job performance

N-26 Employment promotion success

N-27 Appointment or election to a community or professional position of status or authority

O. Social Activity and Role Outcome Measures

** O-1 Occupational career choice

O-2 Graduate self-report of the effect of having attended college on the affiliations sought and the affiliations won

O-3 Social roles and avocations of college graduates

O-4 Career roles and advancement

O-5 Percent voting in municipal and state elections

O-6 Participation in, leadership roles served, and support of religious and service organizations

O-7 Percent running for public office, involvement in election campaigns, and election or appointment to political office at any level

O-8 Family roles

O-9 Self-report of the effect of college on friendships and social relationships

O-10 Self-report of the effect of college on cultural, recreational, and other leisure-time activities

O-11 Self-report of the effect of college on the retirement years

STUDENT KNOWLEDGE AND UNDERSTANDING OUTCOME MEASURES

P. General Knowledge and Understanding Measures

** P-1 Tested breadth of knowledge and understanding

P-2 Student grades in general survey courses

P-3 Observed student performance in simulation situations requiring general knowledge and understanding

P-4 Student self-report of general knowledge and understanding

P-5 Observation of student presentation on, and defense of a general topic

P-6 Areas and agents of student change during college

Q. Specialized Knowledge and Understanding Measures

** Q-1 Tested specialized knowledge and understanding

Q-2 Student grades in specialized courses

Q-3 Observed student performance in simulation situations requiring specialized knowledge and understanding

Q-4 Student self-report of specialized knowledge and understanding

Q-5 Observation of student presentation on, and defense of a specialized topic

PART III

SELECTED MEASURES AND PROCEDURES

A-1
Measure Number

Outcome Structure Category 31.1100

Measure Name

Annual income according to amounts of college education

Definition

Average annual net earnings of women, minorities, and other community citizens having various amounts of college compared to those having no college experience, for overall and by occupational/industry type

Data Sources

Community citizens, former students

Procedures

Access census records, administer community survey questionnaire

Uses

Institutional	State

Comments

A-2
Measure Number

Outcome Structure Category 31.1110

Measure Name

Occupational access of women and minorities

Definition

The proportion of minorities and women in the community that are employed within particular job levels according to their amount of college experience, for overall and by occupational/industry type

Data Sources

Community citizens, former students

Procedures

Access census records, administer community survey questionnaire

Uses

Institutional	State

Comments

A-3
Measure Number

Outcome Structure Category 31.1120

Measure Name

Geographic mobility of college graduates compared to those not attending college

Definition

Percentage of community citizens moving into and out of the community, and how far they travel, according to their amount of college experience, for overall and by occupational/industry type

Data Sources

Community citizens, former students

Procedures

Administer alumni and community servey questionnaires

Uses	Institutional	State

Comments

A-4
Measure Number

Outcome Structure Category 21.1210

Measure Name

Use of college experience for screening and hiring

Definition

The percentage of community firms that give significant weight to the amount and type of college experience in screening prospective employees and hiring, for over and by business/industry type

Data Sources

Community employers

Procedures

Conduct interviews with employer personnel office directors and/or mail out employer questionnaires

Uses

Institutional	State

Comments

A-5
Measure Number

Outcome Structure Category 31.1210

Measure Name

College impact on employee absenteeism and tardiness

Definition

The amount of excessive absenteeism and tardiness on-the-job experienced by community employers according to the amount of employee college experience, for overall, by employee occupational level, and by business/industry type

Data Sources

Community employers

Procedures

Conduct interviews with employer supervisors and personnel office directors and/or mail out employer questionnaires

Uses	Institutional	State

Comments

A-6
Measure Number

Outcome Structure Category 31.1130
31.1220

Measure Name

Institution's purchase of locally-delivered goods and services

Definition

Total amount of dollars expended on goods and services that are purchased by the institution from the local community during a certain time period. Goods and services are distinguished from capital equipments generally defined by each institution in terms of dollars and duration (see COMMENTS). Also, goods and services, as referred to here, do not include utilities purchased from the local community (see Outcome Measure K-2).

Data Sources

Institutional Business Office

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been piloc-tested.

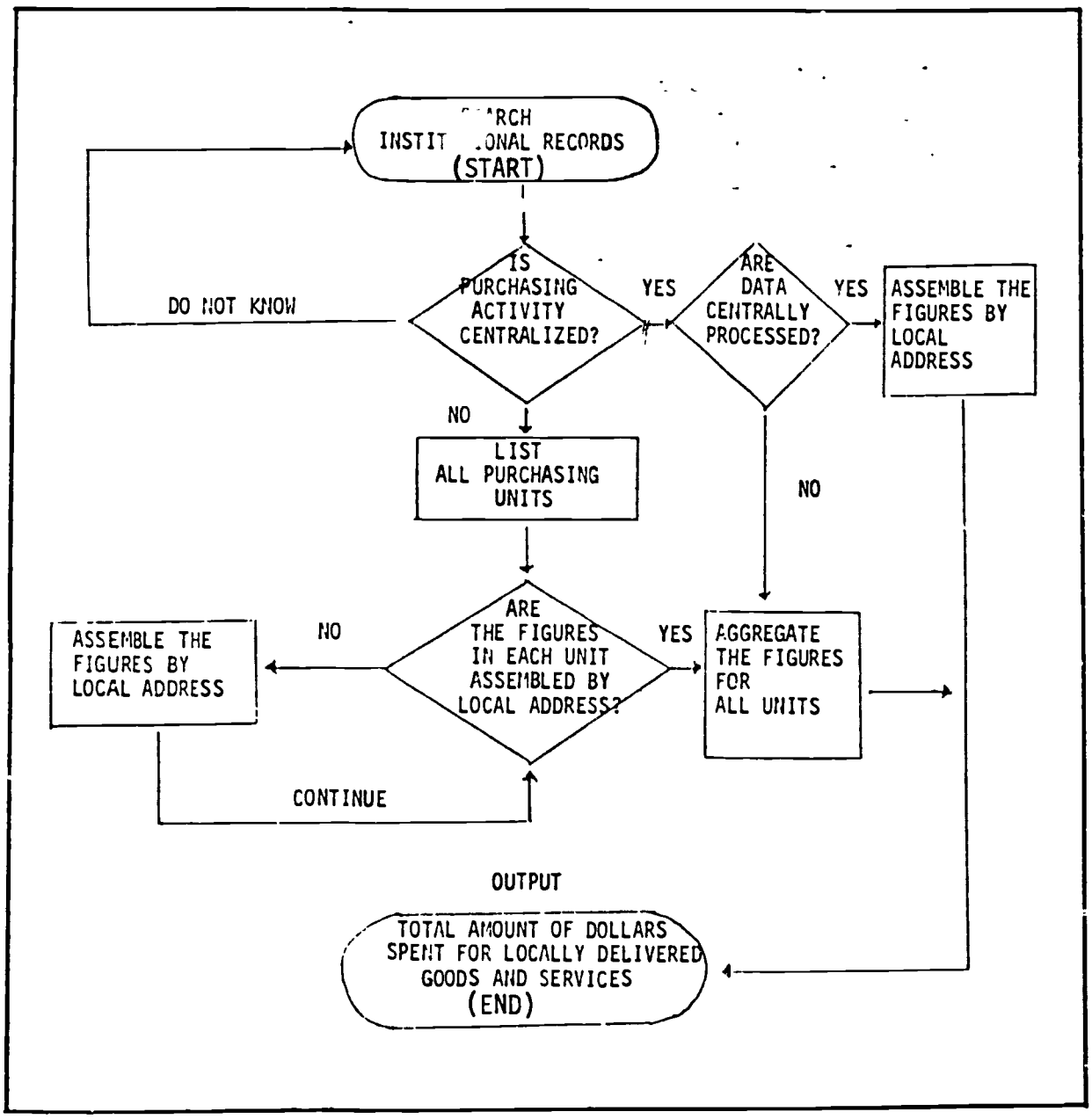
In separate "goods and services" from "capital equipment" each institution uses different criteria of dollars and duration. The user of the manual should consult the institution's business office to determine the criteria for distinguishing goods and services from capital equipment.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-6

Considering the potential diversity in purchasing methods and record keeping among institutions, it is expected that users of the manual will have to make several decisions during the course of gathering the data for this measure. For the purpose of clarifying the process of searching institutional records to obtain the desired information, a simple flow chart is presented in Figure A-1 on the next page. The user may consult the information search process suggested in the figure and make a general plan applicable to his or her particular situation prior to engaging in the data collection activity.

Figure A-1

INFORMATION SEARCH PROCESS FOR OUTCOME MEASURE A-6



Procedures for Use of Institutional Records

1. Identify the time period during which the total amount of dollars expended on goods and services that are purchased by the institution from the local community are to be determined.
2. Determine the boundary of the institution's functional local community.
3. Consult the institution's business office to determine whether the purchasing activity of the institution is carried out by a central purchasing office or by subunits (departments and other organizational units) within the institution.
4. If the purchasing activity is centralized, determine whether the purchasing records contain the addresses of the suppliers in the designated local community. If they do, it is simply a matter of retrieving the information according to the planned format. If, however, the record files do not contain the local supplier's addresses, the user of the manual will have to obtain such information from the existing files that contain the vendor register or invoice vouchers.

If, by chance, the user attempts to use an aggregate figure that already has been developed by certain offices, care should be taken about the reliability of that information. For example, the user might check the aggregate information against the original data or check the information generated by one office against that generated by another office.

5. If the purchasing activity is not centralized or the needed information is not centrally available, the following steps should be taken:
   a. Consult the institution's business office and identify all purchasing units within the institution.
   b. Contact the person in charge of each purchasing unit's expenditure records and obtain the needed information for deriving the measure.
6. Calculate the total amount of dollars paid by each purchasing unit in the institution to suppliers in the designated functional local community within the specified time period.

A-7
Measure Number

Outcome Structure Category 31.1130
31.1220

Measure Name

Institution's capital equipment expenditure relevant to the local community

Definition

Total amount of dollars expended in the local community by institutions as a result of an institution's capital outlay expenditure. Capital outlay is usually defined in terms of a "good" with the cost exceeding (1) a certain amount of dollars and (2) the duration of useful life of the "good" years. The criteria may vary somewhat among institutions. (see COMMENTS)

Data Sources

Institutional Business Office

Procedures

Search of Institutional Records

Uses	Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

The user of this procedure is advised to follow the definition of "capital outlay" used by the institution. Although the criteria may vary somewhat among institutions, the margin of error will be much less significant than that stemming from imposing a new definitio' which would inevitably disrupt the standard operating procedure developed in each institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-7

In obtaining the data on the total amount of dollars expended in the local community by the institution for capital equipment, the user should consult the institution's business office and apply the same information search procedures as that developed for outcome measure A-7.

As pointed out earlier (see procedures for outcome measure K-3), "capital outlay" is distinguished from "goods and serivces" for expenditure analysis purposes. A conceptual distinction is therefore made in the definition of outcome measure A-7.

A-8
Measure Number

Outcome Structure Category 31.1130
31.1220

Measure Name

Institution's capital construction expenditure relevant to the local community

Definition

Total amount of dollars expended in the local community by an institution as a result of its capital construction expenditure. The capital expenditures include (1) purchase of land, (2) land improvement, (3) construction (building and parking lot), (4) building repair and improvement, (5) architect's fees, and (6) others that are specifically designated by each institution as "capital construction."

Data Sources

Institutional Business Office

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-8

It should be pointed out at the outset that the complexity of the data acquisition procedures for outcome measure A-8 is dependent upon the level of detail the user wishes to explore regarding capital expenditure. For instance, the institution may contract with a firm that in turn may subcontract with other firms. Therefore, the original contractor may disperse its capital over several localities through a subcontract process. The potential complexities involved in this process suggest that for analytic purposes some constraints must be placed on the level of detail associated with the flow of an institution's capital expenditures out to the designated functional local community.

The following procedure calls for examination of only those capital expenditures associated with the original contracts arranged between the institution and the local firms. In addition, it is recommended that the focus be limited to the original amount of dollars specified in the contract.

Procedures for Use of Institutional Records

The following procedural steps are designed to obtain that portion of an institution's capital dollars that are spent in the local designated functional community:

1. Identify the period of time in which the capital expenditures in the local community are to be examined.
2. Determine the boundaries of the functional local community.

3. Consult the institution's business office to examine the institution's State of Changes in Fund Balance and its supporting documents.

   The Statement of Changes in Fund Balance shows the total amount of capital expenditures including the major components over a given year. It does not, however, provide the localities in which the capital budget has been spent. The supporting documents will show in detail from whom the land was purchased, if any, what specific projects were financed, and to whom contracts were awarded.

4. Examine carefully the supporting documents and identify for each project (or fiscal transaction):
   a. The address(es) of the firm(s) (or individuals) from which land was purchased, if any;
   b. The address(es) of the firm(s) to which contracts were awarded; and,
   c. The amount of dollars associated with each financial transaction.
5. Select the projects and the firms located in the designated local community.
6. The following table is suggested for organizing the capital expenditure data:

Type of capital expenditures	Name of the localities in which capital budget is spent	Amount of dollars
	TOTAL:	

A-9
Measure Number

Outcome Structure Category 31.1130
31.1220

Measure Name

Local expenditures by faculty and staff

Definition

Total amount of dollars that the faculty and staff in an institution spend in the local community during a certain period of time

Data Sources

Institutional Business Office

Procedures

Administration of a Survey Questionnaire

Uses	Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE A-9

The set of questionnaire items developed for obtaining the data needed for outcome measure A-9 is a modification of a group of the items used in a community impact study conducted by the Office of the Vice-President for University Relations at the University of Colorado (Rautenstraus, 1974). The items have been modified with the permission of the author of the study report.

Procedures for a FACULTY and STAFF Questionnaire

[SEE FOLLOWING PAGE]

The following items are intended to help in estimating the economic impact of [Name of Institution] on the local community.

1. What is your primary employment status at [Name of Institution]?

☐ (1) Full-time Faculty

☐ (2) Part-time Faculty

☐ (3) Full-time Staff

☐ (4) Part-time Staff

2. Approximately how far do you live from campus? (Please write in the space below the estimated number of miles.)

_____ Miles

3. In what type of housing do you reside?

☐ (1) Rent

☐ (2) Own home

4. Please estimate your average monthly expenditures in the folowing categories: [*NOTE: These estimates will be strictly confidential.*]

Rent or house payment	$_____
Utilities (water, gas, electric, telephone, disposal)	$_____
Food and beverages	$_____
Real estate and other local taxes	$_____
Automobile (payment, repairs, gas, insurance)	$_____
Charitable donations	$_____
Cleaning and laundry	$_____
Clothing	$_____
Entertainment	$_____
Furniture	$_____
Health (include dental and insurance)	$_____
Insurance (except auto and health)	$_____
Local public transportation	$_____
Magazines and newspapers	$_____
Personal items	$_____
Miscellaneous	$_____
TOTAL	$_____

5. What is your yearly expenditure for books and educational supplies? $_____

A-10
Measure Number

Outcome Structure Category 31.1130
31.1220

Measure Name

Local expenditures by students

Definition

Total amount of dollars that students spend in the local community during a certain period of time

Data Sources

Current Students

Procedures

Administration of a Survey Questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot-tested

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE A-10

The set of questionnaire items developed for obtaining the data needed for outcome measure A-10 is a modification of a group of the items used in a community impact study conducted by the Office of the Vice-President for University Relations at the University of Colorado (Rautenstraus, 1974). The items have been modified with the permission of the author of the study report.

Procedures for a CURRENT-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

The following questions are intended to help us learn about the economic impact students at [Name of Institution] have on the local community.

1. What is your student status at [Name of Institution]? (PLEASE CHECK ONE)

☐ (1) Freshmen
☐ (2) Sophomore
☐ (3) Junior
☐ (4) Senior
☐ (5) Graduate
☐ (6) Special

2. Are you currently a full-time or part-time student?

☐ (1) Full-time student
☐ (2) Part-time student

3. Approximately how far do you live from campus? (Please write in the space below the estimated number of miles.)

_____ Miles

4. In what type of housing do you live? (PLEASE CHECK ONE)

☐ (1) Campus housing
☐ (2) Rent
☐ (3) Own home
☐ (4) Fraternity or Sorority
☐ (5) Live with parents

5. Please estimate your average monthly expenditures in the folowing categories: [*NOTE: These estimates will be strictly confidential.*]

Rent or house payment	$_____
Utilities (water, gas, electric, telephone, disposal)	$_____
Food and beverages	$_____
Real estate and other local taxes	$_____
Automobile (payment, repairs, gas, insurance)	$_____
Charitable donations	$_____
Cleaning and laundry	$_____
Clothing	$_____
Entertainment	$_____
Furniture	$_____
Health (include dental and insurance)	$_____
Insurance (except auto and health)	$_____
Local public transportation	$_____
Magazines and newspapers	$_____
Personal items	$_____
Miscellaneous	$_____
TOTAL	$_____

6. What is your yearly expenditure for books and school supplies? $_____

Tuition and fees? $_____

A-11
Measure Number

Outcome Structure Category 31.1130
31.1220

Measure Nam

Local expenditures by visitors

Definition

A total amount of dollars that visitors to an institution spend in the local community during a certain period of time

Data Sources

Faculty, staff, students, and academic units, (such as departments and institutes) and visitors

Procedures

Administration of a Survey Questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE A-11

Administration of a survey questionnaire is suggested for obtaining an estimate of the total amount of dollars that visitors at an institution spend in the designated functional local community during a given period of time.

Three alternative sets of questionnaire items have been developed for consideration. The first set is appropriate for administration to faculty, staff, and students. The second set is designed to be administered to the heads of departments or other organizational units in the institution that have sponsored activities attended by visitors from outside the designated functional local community. The final set of items is designed to be administered directly to visitors.

Procedures for VISITOR-EXPENDITURE Questionnaires

[SEE FOLLOWING PAGE]

Alternative #1: Faculty/Staff/Student Questionnaire

FACULTY/STAFF/STUDENT QUESTIONNAIRE

INSTRUCTIONS: The following survey questionnaire is intended to learn how much money your non-local visitors have spent during [Period of Time] in [Name of the local community]. For each type of visitor identified below, please give your best estimates about (1) the number of non-local visitors you have had during [Period of Time]--count each visitor's visit as one visitor; (2) the average length of their stay--count days; and (3) the average amount of their daily spending.

	1	2	3	4
Type of non-local visitors	Number of visitors	Average length of their stay	Average daily local expenditures	Sum = 1x2x3 (Do not write in this column)
Parents & Relatives	____	( ) Days	$_____	
Friends	____	( ) Days	$_____	
Professional Colleagues	____	( ) Days	$_____	
All Others	____	( ) Days	$_____	
Grand Total				

Alternative #2: Organizational Unit Questionnaire

ORGANIZATIONAL UNIT QUESTIONNAIRE

INSTRUCTIONS: The following survey questionnaire is designed to estimate the amount of local expenditures that have resulted from the non-local visitors who have participated in meetings (or conferences) that your organization has sponsored during [Period of Time].*

1. Your name _____

2. Name of your department _____

3. During (period of time) has your department (or organization) sponsored any activities, meetings, or conferences, etc. that were held in [Name of the Local Community] and in which visitors outside the community participated?

   _____1. YES, we have. (Go to Question 4)

   _____2. NO, we have not.

4. Please identify the nature (or name) of meetings and make your best estimate in the categories that follow:

	1	2	3	4
Nature (or name) of activity	Number of days activity lasted	Estimated number of non-local participants	Estimate Average Daily local expenditures of participants	SUM = 1x2x3 (Do not write in this column)

*In some instances, the user may wish to account for visitors who come to the community for conferences. workshops, etc. that are held in campus facilities which are not sponsored by IHE.

A-12
Measure Number

Outcome Structure Category 31.1220

Measure Name

Occupational level and advancement

Definition

The percentage of community citizens employed in management positions according to the amount and type of college experience, for overall and by occupational/industry type

Data Sources

Community Citizens, Former Students

Procedures

Access census records, administer community survey questionnaire

Uses

Institutional	State

Comments

A-13
Measure Number

Outcome Structure Category 31.1220
32.1220

Measure Name

Payment of individual local and state taxes by college graduates compared to others

Definition

Average local and state sales, property, and income taxes paid by community citizens according to their amount of college experience

Data Sources

Community Citizens, Former Students

Procedures

Administer alumni and community survey questionnaires

Uses	Institutional	State

Comments

This measure is also an indicator of the impact of the college on the amount of direct community or state aid to individuals, i.e., welfare payments, which would be viewed by some as a drain on community and/or state resources.

A-14
Measure Number

Outcome Structure Category 21.1220
31.1220

Measure Name

Contribution to community attractiveness for employers

Definition

The percentage of community firms reporting that the presence of a/this postsecondary education was a significant factor in their decision to locate/stay in the community, for overall and by business/industry type

Data Sources

Business and Industry Officials

Procedures

Conduct interviews with and/or send a questionnaire to business and industry officials

Uses

Institutional	State

Comments

A-15
Measure Number

Outcome Structure Category 31.1220

Measure Name

Institution's payment of local and state taxes and tax compensations

Definition

All local taxes and tax compensations (payment made in lieu of taxes) that an institution pays to local governments (e.g., city, county, state) including school districts, towns, cities, counties, and so forth

Data Sources

Institutional Business Office

Procedures

Search of Institutional Records

Uses	Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

Most educational institutions are free from local tax assessments except for an institution's commercial or related activities. However, exceptions do occur. For example, some institutions may enter an agreement with the local government to pay certain amounts in order to compensate for the eroded tax-base due to their presence in the community.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-15

The data for outcome measure A-15 can be obtained through a search of institutional records, generally maintained in the institution's business office.

Procedures for Use of Institutional Records

1. Identify the period of time during which data for the measure will be examined.
2. Contact the chief business officer in the institution and determine:
   a. If the institution paid any locally assessed taxes during the time period in focus. If so, the following table should be completed:

Type of Taxes Paid	Name of Local Governments To Which Taxes Were Paid	Amount Paid
Property Tax		
Sales Tax		
Income Tax		
Other (please specify)		
	TOTAL:	

b. If the institution paid or donated any amount of dollars to the local government(s) in lieu of taxes (for example, in compensation for the eroded tax base) during the time period in focus, the following table should be completed:

Type of Payments or Donations	Name of Local Governments To Which Payments or Donations Have Been Made	Amount Paid
	TOTAL:	

A-16
Measure Number

Outcome Structure Category 31.1220

Measure Name

Institution's purchase of locally provided utilities

Definition

Total amount of dollars expended on utilities (such as gas, electricity, garbage collection, sewage treatment) which were purchased from the local community during a certain time period)

Data Sources

Institutional Business Office

Procedures

Search of Institutional Records

Uses	Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested

ACQUISITION PROCEDURES FOR OUTCOME MEASURE A-16

Most institutions pay standard rates for locally provided utilities and the payments generally are made by the business office. Therefore, cost data on utilities purchased from the local community should be obtainable by simply searching the institution's utility payment records.

Procedures for Use of Institutional Records

The following procedural steps are suggested for obtaining the total dollar figure for locally provided utilities:

1. Identify the time period during which the amount of dollars expended on locally provided utilities will be determined.
2. Determine the boundary of the institution's functional local community.
3. Identify the types of utilities that have been purchased from the defined local community.
4. Tabulate payment figures by using the following format:

Type of Utility	Name and address of the businesses in the local community from which utilities have been purchased	Amount of Dollars
	TOTAL:	

Alternative #3: Visitor Questionnaire

The following questionnaire has been developed as an alternative for identifying the amount of money spent by visitors to the local community. The items in the questionnaire are modified versions of items used in a recent community impact study conducted by the University of Colorado (Rautenstraus, 1974). They have been modified for inclusion in this manual with the permission of the author of the University of Colorado community impact study report.

Various formats and procedures for administering the questionnaire to visitors can be used. The one recommended here calls for (1) printing the INTRODUCTORY REMARKS and questionnaire items on one side of an 8 1/2 x 11 inch piece of paper and (2) printing the return address and a first class business reply mail permit on the other side of the paper.

VISITOR QUESTIONNAIRE

WELCOME! The [Name of Institution] hopes thay you have a good time in [Name of Community]. The [Name of Institution] is conducting a survey to determine how much a visitor spends in [Name of Community]. When your visit is completed, please fill out this questionnaire and return it to us.

To return the questionnaire, please refold and staple the questionnaire so that the top third is covered by the bottom third and the [Name of Institution] address and prepaid postage notice is shown.

Thank you for your help!

* *

1. How far did you travel to come to [Name of Community]? _____ Miles

2. How long did you stay in [Name of Community]? _____ Days

3. What were your expenditures in [Name of Community] in the following categories?

   Food (off-campus) . . . . . $_____
   Lodging . . . . . $_____
   Other (souvenirs, gas, etc.). . . . . $_____

4. Was your primary reason for visiting [Name of Community] related to the [Name of Institution]?

   ☐ Yes
   ☐ No

5. Please check (✓) the [Name of Institution] activities that you attended during your stay:

   ☐ Seminar
   ☐ Conference
   ☐ Forum
   ☐ Workshop
   ☐ Lecture
   ☐ Concert
   ☐ Exhibit
   ☐ Film
   ☐ Museum
   ☐ Athletic Contest
   ☐ Social Event
   ☐ Other _____
   ☐ Visit with son/daughter attending [Name of Institution]

On the other side of the questionnaire print the return address and the business reply mail permit so the respondent can easily fold and staple the questionnaire. An example of what the other side of the questionnaire might look like is presented on the next page.

Obviously, other formats could be used for developing this type of visitor questionnaire. A good person to consult is a graphic arts specialist.

FIRST CLASS
PERMIT NO.
BOULDER, COLO.

BUSINESS REPLY MAIL

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

[Name of Institution]

[Address to Which Questionnaire
is to be Returned]

A-17
Measure Number

Outcome Structure Category 21.1310
31.1310

Measure Name

Employee productivity as related to college

Definition

Employer's reports of employee on-the-job economic productivity according to amount of college experience, for overall and by occupational/industry type

Data Sources

Community Employers

Procedures

Conduct interviews with employer officials and/or mail out employer questionna.res

Uses

Institutional	State

Comments

B-2
Measure Number

Outcome Structure Category 31.2300 / 31.4200 / 31.5100

Measure Name

Community participation in an institution's social, cultural, and recreational programs

Definition

The number of persons from the community who participate in social, cultural, and recreational activities organized and sponsored by an institution for its members and the general public during a specified period of time

Data Sources

Institutional records maintained by institutional departments or agencies sponsoring social, cultural, and recreational programs in which persons in the community participate

Procedures

Search of Institutional Records

Uses	Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

It serves as a proxy measure of an institution's contribution to a community in the form of extramural, cultural, and recreational services.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE B-2

Data on public participation in the institution's social, cultural, and recreational activities can best be obtained by examining the records of the sponsors of such activities within the institution. For example, the offices of student government or student activities often maintain such records. The following procedural steps are suggested.

Procedures for Use of Institutional Records

1. Identify the time period during which the extent of public participation in the institution's social, cultural, and recreational activities will be determined.
2. Determine all the sponsors within the institution that have sponsored one or more social, cultural, and/or recreational activities within the designated period of time.
3. Ask each sponsor to:
   a. Identify the type of activity (ies) offered (social, cultural, or recreational).
   b. Estimate the number of community members who participated in each type of activity.
4. For a descriptive summary of the data, list the estimated number of community participants in each type of activity sponsored during the time period in focus.

B-5
Measure Number

Outcome Structure Category 31.4110

Measure Name

Community use of institutional facilities

Definition

The number of persons from the community utilizing facilities maintained by the institution such as libraries, language labs, testing centers, computer centers, health services, recreation and athletic facilities, museums, and so forth.

Data Sources

Managers of the Institutional Facilities, Members of the Community

Procedures

Search of institutional records; Interviews; Administration of a questionnaire to members of the community

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

It serves as a proxy measure of the extent to which individuals in the community receive various types of personal services from the support programs and facilities of the institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE B-5

The extent to which community members use the educational or support facilities in an institution can be determined by a questionnaire survey of a sample of the community population and/or by a survey of facility managers. As a result, two alternative sets of questionnaire items and associated procedures were developed for obtaining data for this measure.

Procedures for a Facility Use Questionnaire Survey

Alternative #1--Survey of Facility Managers:

1. Select the time period during which the number of persons from the community using the institution's educational and support facilities will be determined.
2. List the facilities that are to be included in the study.
3. Identify the persons in charge of each facility (or who are in the best position to provide the information that is needed).
4. Administer the following "Facility Use Questionnaire" to each of the persons identified in 3 above. If a person is responsible for more than one facility, that person should complete a separate questionnaire for each facility.

Alternative #2--Survey of Community Members:

The following questionnaire item is designed to obtain self-reports from persons in the community to two questions concerning facility use: (1) Do persons in the community know about certain institutional facilities

FACILITY USE QUESTIONNAIRE

The purpose of this short questionnaire is to help us determine the extent to which persons from the community make use of the facilities maintained by [Name of Institution]. Your cooperation in completing the questionnaire is most appreciated. Please return it to [Location] by [Date].

1. Your Name:_____ 2. Date:_____

3. Address:_____

4. Telephone Number:_____

5. Please fill in the following table by estimating, as best you can, the number of persons from the community who have used this facility or have attended certain events, activities, etc. held in the facility for which you are responsible during [Period of Time].

Official Name of Facility: _____

Name or Description of Events or Activities	Estimated Number of Community Attendees	Please give a brief description of how you made your estimate.

being available to them? and (2) How many of those persons have used the facility or attended or participated in events held in the facility? In using this item, it will be necessary to develop a list of the individual facilities (health centers, libraries, counseling-developmental centers, computer centers, gymnasiums, and so forth) to which persons will be asked to react in the survey. Also, it will be necessary to determine the time period in which the respondent will identify if he or she used the facility.

1. The purpose of this questionnaire item is to help us learn about the extent to which persons in the community "know about" and "make use of" various facilities at [Name of Institution]. For each facility listed in the left-hand column, please answer questions "A" and "B."

Name of Facility	Question "A" Check (✓) each box below if you were aware, prior to receiving this questionnaire, that the facility was open to the public.	Question "B" Check (✓) each box below if you have used or have attended or participated in an event at the facility during the last six months.
	___	___
	___	___
	___	___
	___	___
	___	___
	___	___
	___	___

NOTE: The time period in Question"B" can be changed based on the purpose of your study.

C-2
Measure Number

Outcome Structure Category 31.4210

Measure Name

Enrollment of non-degree and non-certificate seeking students

Definition

The number of persons, who are not seeking a degree or certificate (nonmatriculating students), enrolled in regular credit-producing instructional programs or courses, as defined by subprograms 1.1 and 1.2 in the NCHEMS Program Classification Structure (PCS)

Data Sources

Institutional Student Records

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

It is a proxy measure of an institution's contribution to community educational development.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-2

The data acquisition procedures developed for outcome measure C-2 are relatively straightforward in the sense that they require a single headcount of "nonmatriculating" students, that is, of those students who are not working toward a degree or a certificate, who are enrolled in credit-producing programs or courses. The procedures suggest that the NCHEMS Program Classification Structure (Collier 1978) be used to organize the different credit-producing programs in which the "nonmatriculating students" are enrolled.

Procedures for Use of Institutional Records

1. Determine the time period during which the number of non-degree and non-certificate seeking students enrolled in credit-producing instructional programs will be ascertained.
2. Examine the individual student files and identify all "nonmatriculating students."
3. For the students identified in 2 above, identify those who are enrolled in the PCS degree-related instruction subprograms:
   1.1--General Academic Instruction
   1.2--Vocational/Technical Instruction
4. Next, for each PCS Subprogram and to the extent deemed appropriate, disaggregate enrollees by course subject matter category, course level, student level, and credit/noncredit status using institutions own coding or that specified in appendices A-C of the PCS (Collier 1978)
5. For a descriptive summary of the data, total the number of "nonmatriculating students" enrolled in each Subprogram Category of the PCS.

C-3
Measure Number

Outcome Structure Category 31.4210

Measure Name

Community participation in community education programs

Definition

The number of persons, who are not seeking a degree or certificate (nonmatriculating students), enrolled in non-credit-producing instructional activities that are offered on or off campus

Data Sources

Institutional Student Records

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot-tested.

It is a proxy measure of an institution's contribution to community educational development.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-3

The procedures for obtaining data for outcome measure C-3 require a simple headcount of those persons enrolled in those non-credit-producing instructional activities as defined by Subprograms 1.4, 1.5, 1.6, 1.7, and 1.8 (nondegree general studies, occupation-related instruction, social roles/interaction instruction, home and family life instruction, and personal interest and leisure instruction, respectively) in the revised Program Classification Structure (Collier 1978). A common term for such programs is Community Education, which was defined by Collier (1975) in an earlier version of the PCS as follows:

> Community Education--1.3 includes those instructional activities that are noncredit and are therefore not applicable towards a postsecondary degree or certificate. These instructional activities may be offered both on or off campus and may be taken by either matriculated students or members of the general community. Any work that produces credit toward the high school diploma should be included in 1.4--Preparatory and Adult Basic Education.

Examples of Community Education include:

- Avocational Education (wine testing, great books, painting, weaving, guitar, child care, gardening, do-it-yourself, training pets, speed reading, recreational folk dancing, and so forth)
- Adult Basic-Education Program
- Professional Review or Refresher Courses
- Citizenship and languages programs for persons seeking U.S. citizenship

In the procedural steps that follow, a distinction is made between matriculating students who are enrolled in such activities and nonmatriculating students who are enrolled.

Procedures for Use of Institutional Records

1. Determine the time period during which the number of persons participating in non-credit-producing Community Education

instructional activities (as defined by Subprograms 1.4-1.8 the NCHEMS revised Program Classification Structure) will be ascertained.

2. List all instructional activities that would be classified in the PCS Subprograms 1.4-1.8 during the time period in focus.

3. Examine the individual student files and identify the matriculating students who have enrolled in each Community Education activity identified in 2 above, and then the nonmatriculating students who have enrolled in each of those activities.

4. The data should now be organized for outcome measure C-3.

3.3 Community Services

Definition: This subprogram consists of resources, services, and expertise made available to persons and groups outside the context of the institution's regular Instruction, Research, and support programs that are not included in subprograms 3.1, 3.2, 3.4, and 3.5. Community Services (3.3) activities differ from Cooperative Extension Services (3.4) in that they are generally sponsored and controlled by the institution; extension services usually involve a sharing of programmatic and fiscal control with an outside agency

- **Provision of Faculty/Staff Services**—Those activities designed to make faculty/staff/student knowledge and skills available to the community or to groups external to the institution. The activities that should be classified in this category involve the use of the skills and expertise of the institution's own staff for purposes that are not part of the regular Instruction, Research, or support programs. This category includes institutionally sponsored consulting services and those instructional activities that represent the provision of faculty/staff resources outside the context of the Instruction program.

  Examples: Consulting with businesses, public school system, local governmental agencies
  Provision of coaches for community summer camp
  Faculty/staff participation on community-action committees
  Summer camps for high school students (e.g., cheerleader camps, music camps)
  Services related to the use of special equipment and facilities
  Public-service-related instructional activities

- **Provision of Facilities/Equipment**—Includes providing the institution's physical facilities and/or equipment for community activities.

  Examples: Community meetings and events held in institutional facilities
  Community use of institution's gymnasium and recreation facilities for a summer camp

- **Provision of Cultural and Recreational Services**—Those cultural and recreational programs arranged and sponsored outside the context of the Student Service program. (Cultural and recreational activities that are conducted primarily for students as part of the Student Service program should be classified in subprogram 5.2, Social and Cultural Development.)

  Examples. Lecture and fine-arts series
  Concerts and recitals (visiting artists)

3.1 Direct Patient Care

Definition: This subprogram includes those activities carried out for the specific purpose of providing direct patient care (prevention, diagnosis, treatment, education, rehabilitation, and so forth) The provision of such care may be for the benefit of either humans or animals (veterinary care). In the postsecondary-education setting, these services are typically rendered under the auspices of a teaching hospital or health-sciences center and are provided for the benefit of a clientele in the community-at-large rather than for the institution's own student body or faculty and staff. Patient-care activities carried out solely for the benefit of the institution's students should be classified in subprogram 5.7, Student Health/Medical Services; patient-care activities carried out solely for faculty and staff should be classified in 6.5, Faculty and Staff Auxiliary Services.

This subprogram includes only those activities directly related to the provision of patient care. In classifying the activities of a teaching hospital, one might look upon the hospital as a separate campus, thereby allowing for the use of all programs within the *PCS*. Thus, activities that are carried out within the *setting* of a teaching hospital but that cannot legitimately be considered part of direct patient care (such as instruction, research, and administration) should be appropriately classified elsewhere. Instructional activities should be classified in the appropriate subprograms in the Instruction program, 1.0; research activities in the Research program, 2.0; administrative activities in the Institutional Administration program, 6.0, and physical-plant activities in the Physical Plant Operations program, 7.0. Those health-care support services that are carried out in direct support of the provision of patient care, but that are not themselves a part of patient care, should be classified in subprogram 3.2, Health Care Support Services.

Within the Direct Patient Care subprogram, two ways of further classifying activities can be used, each independent of the other. One is to focus on the setting in which the patient-care functions are carried out (for example, inpatient, ambulatory, outreach, emergency). A second way is to look at the type of care being provided, such as medical/surgical, rehabilitative, dental, or veterinary care. In fact, within each of these types of patient care a further disaggregation can be made by medical specialty (for example, pediatrics, obstetrics, dermatology).

The following categories can be used for a more detailed classification of activities by setting:

- **Inpatient**—Those activities designed to provide direct patient care within the confines of the care setting to persons who are residing at least overnight on the premises. Typically, inpatient clients are considered those persons who are assigned a bed at the care facility.
- **Ambulatory**—Those activities designed to provide direct patient care within the confines of the care setting to persons who are resident

neither overnight nor beyond the time required to provide the care Excluded from this category is emergency patient care that is delivered in an ambulatory setting.

- **Outreach**— Those activities in which the patient-care provider goes to the patient to deliver the care (such as a home-care program). Excluded from this third category is emergency patient care in which the care provider goes to the patient.
- **Emergency**—Those activities designed to provide direct patient care to persons requiring immediate attention due to the acute nature of their health-care problem.
- **Mixed Function**—Those activities that are a combination of several of those described above so that the individual activities cannot be separated and classified in the appropriate categories. If the individual component parts can be separately identified, however, they should be classified in the appropriate categories.

The following categories can be used for a more detailed classification by type of care:

- **Medical/Surgical Care**—Those activities related to preventing, caring for, and assisting in the cure of disease and the care of the injured as well as surgical functions.
- **Behavioral**—Those activities related to the treatment of psychological and behavioral problems as well as to the promotion of psychological well-being.
- **Rehabilitative Care**—Those activities related to the restoration of bodily functions and structures in order to regain patient self-sufficiency.
- **Public/Community Medicine**—Those activities related to the health and illness of populations.
- **Patient Education**—Those activities carried out to provide patients with the knowledge and attitudes needed to cope effectively with their own health problems.
- **Dental Care**—Those activities related to care and treatment of human teeth and structures.
- **Veterinary Care**—Those activities pertaining to the care and treatment of animals and their diseases
- **Supportive Care**—Those activities related to conducting prescribed treatment plans and to supporting the implementation of those plans (for example, patient hygiene, observation of patient status)
- **Other Patient Care**

3.2 Health Care Supportive Services

Definition: This subprogram includes those activities that are unique to a teaching hospital, health-sciences center, or clinic and that directly support the provision of health care but that cannot themselves legitimately be considered part of the provision of direct patient care. The following categories should be used for a more detailed classification of activities within this subprogram:

- **Medical Support Services**—Those activities that are medical in nature and that indirectly support patient care but are not actually part of the provision of direct patient care.

  Examples: Blood bank
  Dietary and nutritional services (unless part of the patient's treatment)
  EEG
  EKG
  Optical services
  Pharmacy
  Physiological instrumentation and monitoring
  X-ray services

- **General Hospital/Clinic Support**—Those administrative and support activities that are unique to the operation of a hospital or medical clinic. Excluded from this category are those administrative activities that can be classified appropriately within the various subprograms of the Institutional Administration program (6.0).

  Examples: Admitting and credit
  Forensic medicine
  Medical records
  Patient charging and accounts
  Inpatient reception desk

- **Retail Services and Concessions**—Those activities provided as a comfort or convenience to the visitors and clientele of the hospital or clinic. These activities are often operated as income-generating or self-supporting enterprises.

  Examples. Gift shop
  Social services
  Television-rental services

C-4
Measure Number

Outcome Structure Category 31.4200

Measure Name

Community participation in cooperative extension services

Definition

The number of persons from the community who have participated in cooperative extension service activities as defined by Subprogram 3.3 in the NCHEMS Program Classification Structure (PCS)

Data Sources

Institutional records maintained in the office responsible for cooperative extension service activities

Procedures

Search of institutional records

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot tested.

It is a proxy measure of the extent to which the community receives direct assistance and services of various types from the primary programs of the institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-4

This outcome measure represents one indicator of the impact the institution and its programs have on the community. "Cooperative extension services", as defined by the NCHEMS Program Classification Structure (Collier 1978) are:

> Cooperative Extension Service (subprogram 3.4) includes those activities that make resources, services, and expertise available outside the Instruction, Research, and support programs and that are conducted as cooperative efforts with outside agencies. (Note: This category includes only those extension services that are considered to be public service; it should not be used to classify the entire extension division of the institution.) Excluded from this subprogram are those instructional and research activities offered through an extension division. A distinguishing feature of the activities included in this subprogram is that programmatic and fiscal control are usually shared with one or more external agencies or governmental units.

Procedures for Use of Institutional Records

1. Identify the time period during which the number of community members participating in Cooperative Extension Services activities (PCS Subprogram 3.4) will be determined.
2. List all the Cooperative Extension Service programs that have been available to members of the general community during the period of time in focus.
3. Identify the number of participants in each program. (Do not include persons who participate in these programs for purposes of seeking credit toward a degree or certificate.)
4. For a descriptive summary of the data, list the total number of community participants for each cooperative extension service program offered during the period of time in focus.

C-5
Measure Number

Outcome Structure Category 31.2000

Measure Name

Educational goals achieved by community participants

Definition

The degree of perceived personal improvement and satisfaction with respect to job promotion and salary increase, development of technical skills, leadership and human relations, and other personal attributes among community participants in institutional programs

Data Sources

Persons in the community who have participated in specific educational programs on and/or off campus

Procedures

Interviews; Administration of a Survey Questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested. It represents a community counterpart of many of the student measures in this Manual. Instead of measuring the dimensions of student growth and development, however, the above outcome measure is aimed at measuring the growth and development of those persons who come into contact with the institution and its programs but are not seeking a degree or certificate.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE C-5

One procedure recommended for obtaining data for outcome measure C-5 requires the development and use of a survey questionnaire.

Procedures for a Questionnaire of Community Members Taking Courses

The following questionnaire items are intended to learn if the educational activities in which you participated at [Name of Institution] helped you achieve your educational goals.

1. Please identify the name of the educational program (or courses) in which you participated during (Period of time).

   _____

   _____

2. Which of the following statements best describe your reasons for participating in the above program(s)? Please check (✓) all that apply. Also, indicate to the right of those statements you have checked the extent to which your expectations were realized as a result of your involvement.

	(1) Very Much	(2) Quite A Bit	(3) Some-What	(4) Not At All
☐(1) To increase my chances to qualify for a new job or occupation.	___	___	___	___
☐(2) To enhance my chances for a possible increase in salary and/or possible job promotion.	___	___	___	___
☐(3) To improve my human relations skills and/or leadership skills.	___	___	___	___
☐(4) To improve my knowledge and technical skills required in my work.	___	___	___	___
☐(5) To improve my general knowledge and skills for personal satisfaction.	___	___	___	___
☐(6) To have a personal experience with the academic world.	___	___	___	___
☐(7) Other (Please specify) _____	___	___	___	___

3. In reflecting upon your experiences in these programs, would you recommend them to a friend or a relative who is in a situation similar to yours?

   ___(1) Definitely yes

   ___(2) Probably yes

   ___(3) Probably not

   ___(4) Definitely not

C-6
Measure Number

Outcome Structure Category 31.2330
31.2440
31.4210

Measure Name

Community awareness and use of, and satisfaction with instructional programs

Definition

The degree of awareness and use of, and the satisfaction with instructional programs, demonstrated by members of the community

Data Sources

Persons in the local community

Procedures

Interviews; Administration of a survey questionnaire

Uses

Institutional	State

Comments

Although this measure was not included in the original field review document, it has been pilot tested.

This measure was used as part of the development of the Community Impact Study Handbook for Community Colleges.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE C-6

One procedure recommended for obtaining data for outcome measure C-6 requires the administration of a survey instrument similar to the one below.

1. (Name of Institution) offers several types of educational programs. Please check (✓) each program area you were aware of before reading this questionnaire.

   - ☐ (1) Skill training and upgrading programs
   - ☐ (2) College transfer courses and programs
   - ☐ (3) Career and occupational courses and programs
   - ☐ (4) General academic courses and programs
   - ☐ (5) Was not aware of these programs

   (List of programs would be developed by institution--what appears above is a sample.)

2. Have you enrolled in any of the programs listed below?

   - ☐ (1) I have not enrolled in any program.
   - ☐ (2) Skill training and upgrading program
   - ☐ (3) College transfer courses and programs
   - ☐ (4) Career and occupational courses and programs
   - ☐ (5) General academic courses and programs

3. How satisfied were you with your educational experiences at (Name of Institution)?

   - ☐ (1) I have had no educational experiences at (Name of Institution).
   - ☐ (2) Completely dissatisfied
   - ☐ (3) Dissatisfied
   - ☐ (4) Neutral
   - ☐ (5) Satisfied
   - ☐ (6) Completely satisfied

C-7
Measure Number

Outcome Structure Category 31.2330
31.2440
31.4200

Measure Name

Community awareness and use of, and satisfaction with assistance services

Definition

The degree of satisfaction experessed by members of the community concerning assistance services provided by the institution

Data Sources

Persons living in the community; Managers of Institutional Services

Procedures

Interviews; Adminstration of a questionnaire to members of the community; a search of institutional records

Uses

Institutional	State

Comments

Although this measure was not included in the original field review document, it has been pilot tested. This outcome measure is identified as a proxy measure of the extent to which individuals in the community are aware of, use, and are satisfied with the various types of services provided by the institution. This measure can be considered a supplement to Measure C-6.

This measure was used as part of the development of the Community Impact Study Handbook for Community Colleges.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE C-7

The extent to which community members use educational or support services in an institution can be determined by an institutional record search, telephone or in-person interviews (for example, at a shopping center), of samples of community members, or by administering a questionnaire to members of the community. Surveying the community also provides information concerning awareness of and satisfaction with the services. The two alternative procedures for obtaining data for this measure are:

I. Record Search (Survey of Service Managers)

1. Select the time period during which the number of persons from the community using the institution's educational and support services will be determined.
2. List the services to be included in the study.
3. Identify the persons in charge of each service--the person in the best position to provide the needed information.
4. Administer the "Service Use Questionnaire."

II. Survey of Community Members

The questionnaire items on the following page are designed to obtain self-reports from persons in the community to three questions concerning service use:

- Do persons in the community know about certain institutional services?
- Do persons in the community use institutional services?
- Are persons who use institutional services satisfied?

SERVICE USE QUESTIONNAIRE

The purpose of this short questionniare is to help us determine the extent to which persons from the community make use of the services maintained by (Name of Institution). Your cooperation in completing the questionnaire is most appreciated. Please return it to (Location) by (Date).

1. Your Name: _____ 2. Date: _____

3. Address: _____

4. Telephone Number: _____

5. Please fill in the following table by estimating, as best you can, the number of persons from the community who have used this service for which you are responsible during (Period of Time).

Official Name of Service: _____

Name or Description of Events or Activities	Estimated Number of Community Attendees	Please give a brief description of how you made your estimate

4. Listed below are a number of services which are viewed by (Name of Institution) as being of potential use to various members of the community.

   For each service listed below, please indicate:

   1.) Your awareness of the service.

   2.) If you have used the service.

   3.) Your satisfaction with the service if used.

SERVICE	Are you aware of this service?		Have you used it?		Were you satisfied-- if used?	
	Yes	No	Yes	No	Yes	No
1.	☐	☐	☐	☐	☐	☐
2.	☐	☐	☐	☐	☐	☐
3.	☐	☐	☐	☐	☐	☐
4.	☐	☐	☐	☐	☐	☐
5.	☐	☐	☐	☐	☐	☐
.						
.						
.						

Sub-communities that might be surveyed include:

- Registered voters
- Other educators in the community
- Social agency leaders
- Civic leaders
- Faculty/staff of the institution
- Employers in the community

C-8
Measure Number

Outcome Structure Category 31.2110
31.2440

Measure Name

Community unmet educational needs .

Definition

The perceptions of people in the community concerning needs that the institution is not meeting, but should be attempting to meet

Data Sources

Persons in the local community

Procedures

Interviews; Administration of a survey questionnaire

Uses

Institutional	State

Comments

Although this measure was not included in the original field review document, it has been pilot tested.

This is a measure of the degree and number of unmet educational needs in the community that the institution might meet.

This measure was used as part of the development of the Community Impact Study Handbook for Community Colleges.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE C-8

The extent to which community members perceive unmet needs in the community that the institution is not meeting, but could be meeting, can be obtained by a questionnaire survey. Some of the sub-communities that might be surveyed include:

- Registered voters
- Otner educators in the community
- Social agency leaders
- Civic leaders
- Faculty/staff of the institution
- Employers in the community

The following questionnaire item is designed to gather appropriate information.

Are there educational needs in the community you feel (Name of institution) should be attempting to meet, but is not meeting at the present time?

☐ (1) Yes

☐ (2) No

If yes, what are they? _____

_____

_____

_____

C-13
Measure Number

Outcome Structure Category 31.2110 / 31.2330 / 31.2730

Measure Name

Institutional goal attainment

Definition

The degree of satisfaction expressed by members of the community as to how well the institution is achieving its goal(s)

Data Sources

Persons in the local community

Procedures

Interviews; Administration of a survey questionnaire

Uses

Institutional	State

Comments

Although this measure was not included in the original field review document, it has been pilot tested.

This measure was used as part of the development of the Community Impact Study Handbook for Community Colleges.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE C-13

The extent to which community members perceive the institution is achieving its states goal(s) can be obtained by a questionnaire survey. Some of the subcommunities that might be surveyed include:

- Registered voters
- Other educators in the community
- Social agency leaders
- Civic leaders
- Faculty/staff of the institution
- Employers in the community

The following questionnaire item is designed to gather appropriate perceptions.

ABOUT (NAME OF INSTITUTION)

The overall purpose of (Name of Institution) is to provide educational programs and services as needed by the residents of the community beyond the high school level. The education and training provided by (Name of Institution) are intended to help students obtain the knowledge and skills needed for educational and occupational career advancement, personal development, and recreational development.

Given this overall purpose of (Name of Institution), how well do you feel (Name of Institution) is achieving this goal?

- ☐ (1) Very poor job
- ☐ (2) Less than satisfactory job
- ☐ (3) Satisfactory job
- ☐ (4) More than satisfactory job
- ☐ (5) Excellent job

D-1
Measure Number

Outcome Structure Category 22.3300

Measure Name

Research proposals funded

Definition

Number and percentage of research proposals that were funded within a certain time period, by PCS subprogram, annual level of funding and duration of funding

Data Sources

Institutional Research Contracts Officer or Faculty/Staff

Procedures

Search of institutional records

Uses

Institutional	State

Comments

This measure was included in the original field review document. It is a proxy measure of the discovery, interpretation, and application of new knowledge.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-1

The procedural steps recommended for obtaining data for outcome measure D-1 require the use of institutional records that contain information about research proposals that have been acted upon and funded by various funding sources. A proposal is defined as acted upon once it has been submitted to a funding organization and the funder has made a decision to fund or not fund the proposal. Normally, this information can be collected from an institution's office for grants and contracts. If such an office does not exist, a survey of the heads of academic departments and research centers in the institution will need to be conducted to obtain the data necessary for deriving this measure. Once the appropriate data source is determined, the following steps can be implemented:

1. Specify the time period for which the measure will be derived (for example, fiscal year).
2. For each organizational unit within subprograms 2.1--Institutes and Research Centers and 2.2--Individual or Project Research of the NCHEMS revised Program Classification Structure (PCS), identify the number of research proposals that have been acted upon by funders in the specified time period.
3. For each proposal that was acted upon identify:
   a. The requested level of total funding.
   b. The requested duration of funding using the following categories:

(1) less than 1 year

(2) 1-3 years

(3) More than 3 years

c. Whether or not the proposal was funded.

4. For each acted upon proposal that was funded identify:

a. The actual level of funding;

b. The actual duration of funding.

5. Data should now be available for determining the number of proposals funded as a percentage of proposals acted upon, by PCS 2.0 sub-program categories, level of funding, and duration of funding.

D-2
Measure Number

Outcome Structure Category 22.3300

Measure Name

Research restricted revenues

Definition

Total research restricted revenues as a percentage of the total budget, by PCS program activity center and by source of revenues

Data Sources

Institutional Budget Officer

Procedures

Search of institutional records

Uses

Institutional	State

Comments

This measure was included in the original field review document. It is a proxy measure of the discovery, interpretation, and application of new knowledge.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE D-2

The procedural steps recommended for obtaining data for outcome measure D-2 call for the use of institutional records concerning revenues received by the research program activity centers in the institution. The data necessary for deriving this measure should be available in the institution's business office or in the office for grants and contracts.

The following steps are used for deriving data for measure D-2

1. Specify the time period for which the measure will be derived (for example, the academic year).
2. For each organizational unit within subprograms 2.1--Institutes and Research Centers and 2.2--Individual or Project Research of the NCHEMS revised Program Classification Structure, identify the total restricted current fund revenues expended from the following source categories:
   a. Governmental Grants and Contracts:
      (1) Federal
      (2) State
      (3) Local
   b. Private Gifts, Grants, and Contracts.

The following data display format can be used for organizing the revenue data (where the last four digits of the code numbers refer to Hegis categories):

2.0 RES ARCH PROGRAM CATEGORIES	SOURCE OF REVENUES (Restricted)				
	Government Grants & Contracts			Private Gifts, Grants & Contracts	Total
	Federal	State	Local		
2.1 Institutes & Research Centers					
2.1.0100 2.1.0200 NOTE: Refer to Appendix C for a complete listing of the HEGIS disciplines. 2.1.5500 2.1.9200					
2.2 Individual or Project Research					
2.2.0100 2.2.0200 NOTE: Refer to Appendix C for a complete listing of the HEGIS disciplines. 2.2.5500 2.2.9200					

3. Identify total budget for each organizational unit in sub-programs 2.1 and 2.2 of the PCS.

4. Once step 3 is completed, the total restricted revenues expended as a percentage of the total budget for the designated time period can be calculated for each organizational unit associated with 2.1 and 2.2 of the PCS.

F-1
Measure Number

Outcome Structure Category 12.2750

Measure Name

Student success in obtaining first job after leaving the institution

Definition

Number and percentage of students (graduates and nongraduates) who are employed within a certain time period after leaving the institution

Data Sources

Exiting Students, Former Students

Procedures

Interviews; Administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE F-1

One of the alternative procedures recommended for obtaining data for outcome measure F-1 is the use of a survey questionnaire. Two sets of items are provided here, one for use in an existing-students questionnaire and one for use in a former-students questionnaire. In each case, several items have been included to gain the respondents' preceptions about (1) how they regard this job, (2) how they found it, and (3) its linkage to their major field of study.

Questionnaire items for an EXITING-STUDENT Questionnaire

1. Do you currently hold or have you secured a a full-time job (35 hours or more per week) in which you plan to work once you complete your studies at (Name of Institution)?

   ____(1) Yes (GO TO QUESTION 2)

   ____(2) No (SKIP TO QUESTION 11)

2. For whom do you (or will you) work? (Name of employing firm)

   _____

   City_____State___Zip_____

3. What kind of business or industry is the job in? (For example, accounting firm, public school, TV manufacturer)

   _____

4. What kind of work does the job involve? (For example, accounting, teaching, electrical engineering, welding)

   _____

5. Are you (or will you be):

   ____(1) An employee of a private business?

   ____(2) Self-employed in your own business?

   ____(3) An employee of local, state or federal government?

   ____(4) A public employee of a non-governmental organization? (For example, an environmental agency)

6. Which statement best describes how you regarded you first full-time job? (Check one)

   (1) Employment with definite career potential

   ____(2) Employment with possible career potential

   ____(3) Employment to earn money while I decided what kind of work I wanted

   ____(4) Temporary employment to earn money to do something else (travel, school, have free time, etc.)

   ____(5) Temporary employment until something better could be found.

7. How did you learn of this job: (Check primary source)

   ____(1) Was already working in it while enrolled

   ____(2) College placement office

   ____(3) Professional organization or journal

   ____(4) Public or private employment agency

   ____(5) Newspaper advertisement

   ____(6) Direct application to employer

   ____(7) Faculty referral

   ____(8) Referral through friend or relative

   ____(9) Other (please specify)

8 To what extent was this job related to the major/program you were enrolled in at our school? (Check one)

   ____(1) Not related

   ____(2) Somewhat related

   ____(3) Directly related

9. If you answered 1 or 2 for Item 8, please check from the list below the principal reason why your current job is not in your major/program.

   ____(1) I never looked for a job related to my major/program.

   ____(2) I looked, but could not find a job related to my major/program without moving out of the geographic area.

   ____(3) I looked, but could not find a job related to my major/program even in other geographic areas.

   ____(4)- I have held a job related to my major/program, but decided to get into a new employment field.

10. How well do you feel our school prepared you for this job? (Check one)

    ____(1) Inadequate preparation

    ____(2) Fair preparation

    ____(3) Good preparation

    ____(4) Excellent preparation

    (NOW GO TO QUESTION___)

11. Are you currently seeking or planning to seek (within 6 months) a full-time job (35 hours or more a week)?

    ____(1) Yes (GO TO QUESTION 10)

    ____(2) No (SKIP TO QUESTION____)

12. In what kind of business or industry is the job you are (or will be) seeking? (For example, accounting firm, public school, TV manufacturer)

    _____

13. What kind of work do you expect to do on the job you are (or will be) seeking? (For example, accounting, teaching, electrical engineering, welding)

    _____

Questionnaire Items for a FORMER-STUDENT Questionnaire (If the questionnaire is to be limited to graduates, change the work "leaving" to "graduating" or "graduation" as appropriate)

1. Have you held a full-time job (35 hours or more per week) since leaving our school? (Check one)

   ____(1) Yes (SKIP TO QUESTION 4)

   ____(2) No (GO TO QUESTION 2)

2. Have you sought or do you plan to seek (within 6 months), a full-time job since leaving (Name of Institution)?

   ____(1) Yes (GO TO QUESTION 3)

   ____(2) No (SKIP TO QUESTION__)

3. What was the major reason you have not obtained a job since leaving (Name of Institution)?

   ____(1) I only tried to find a job recently

   ____(2) I have not been able to find a job related to my major field of study

   ____(3) I have not been able to find a job for which I could qualify

   ____(4) I interviewed for jobs for which I qualify, but was not hired

   ____(5) Other reason (please specify)____

   _____

4. How long after leaving school did it take you to find your first full-time job?

   ____(1) I had the job before leaving

   ____(2) 2 months or less

   ____(3) 3-6 months

   ____(4) 7 months to 1 year

   ____(5) over 1 year

5. What was (or is) the name and address of your first full-time employer? (Name of employing firm.)

   _____

   City_____State_____Zip_____

6. What kind of business or industry was (or is) your first job in? (For example, accounting firm, public school, TV manufacturer)

   _____

7. What kind of work did (or does) your first job involve? (For example, accounting, teaching, electrical engineering, welding)

   _____

8. In your first full-time job after leaving (Name of Institution), were you (or are you).

   ____(1) An employee of a private business?

   ____(2) Self-employed in your own business?

   ____(3) An employee of local, state, or federal government?

   ____(4) A public employee of a nongovernmental organization? (For example, an environmental agency, a public school system)

9. Which statement best describes how you regarded your first full-time job? (Check one)

   ____(1) Employment with definite career potential

   ____(2) Employment with possible career potential

   ____(3) Employment to earn money while I decide what kind of work I wanted

   ____(4) Temporary employment to earn money to do something else (travel, school, have free time, etc.)

   ____(5) Temporary employment until something better could be found

10. How did you learn of this job: (Check primary source)

    ____(1) Was already working in it while enrolled

    ____(2) College placement office

    ____(3) Professional organization or journal

    ____(4) Public or private employment agency

    ____(5) Newspaper advertisement

    ____(6) Direct application to employer

    ____(7) Faculty referral

    ____(8) Referral through friend or relative

    ____(9) Other (please specify)

The open-end questionnaire items in the procedures above have been used by the U.S. Bureau of Census to determine the employment sector and the kind of work in which a person is involved. They have been suggested here since they have the advantage of allowing the respondent to provide his or her own answer and obtaining responses that can be compared to the data the Bureau of Census collects in its annual educational attainment survey, which is conducted each March. (See U.S. Bureau of Census, Current Population Reports: Series P-20, "Educational Attainment in the United States.") However, the open-end items have the disadvantage of requiring the data processor either to code the responses using the Bureau of Census' categories, which are quite detailed, or to develop his or her own categories for coding purposes.

As an alternative, the following closed-end questionnaire items are suggested as possible replacements for items 3, 4, and 5 in the EXITING STUDENT Questionnaire procedure and items 6, 7, and 8 in the FORMER-STUDENT Questionnaire procedure. The occupations coded in Item 2 below can come from the list of Appendix B or another categorization of the institution's choosing.

1. In which of the following employment sectors was this job? (Check one)

   ☐ (1) Government

   ☐ (2) Education

   ☐ (3) Other nonprofit organizations

   ☐ (4) Business and service

2. From the list that appears on page __, which entry best describes the full-time occupation in which you are (or will be) employed? (Please write its 2-digit code in the space below.)

   Occupation: ☐☐ _____

1. In which of the following employment sectors was this job? (Check one)

   ☐ (1) Government

   ☐ (2) Education

   ☐ (3) Other nonprofit organizations

   ☐ (4) Business and service

2. How much of the work in this first full-time job was devoted to the following activities? (CHECK ONE FOR EACH ACTIVITY)

	(1) A Major Amount	(2) A Minor Amount	(3) None
A. Teaching	___	___	___
B. Research and Development	___	___	___
C. Administration or Management	___	___	___
D. Service to Patients or Clients	___	___	___
E. Other (please specify) _____ _____	___	___	___

3. Was your first full-time job after leaving (Name of Institution) the job you most preferred at the time?

   ☐ (1) Yes

   ☐ (2) No

F-2
Measure Number

Outcome Structure Category 12.2750

Measure Name

Student success in obtaining preferred first job

Definition

Number and percentage of students who received the job of their first choice upon leaving the institution

Data Sources

Former students

Procedures

Telephone interview; administration of a survey questionnaire

Uses	Institutional	State

Comments

This measure was included in the first field review document and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE F-2

One procedure for the acquisition of data for outcome measure F-2 is the use of a survey questionnaire. Because of the nature of the measure, the procedures are only appropriate for use in a FORMER-STUDENT Questionnaire.

Items for a FORMER-STUDENT Questionnaire

It should be noted that questionnaire items 1 and 2 below are suggested since they are comparable to those used in the American Council on Education's longitudinal follow-up studies of college students. As a result, the results obtained from the use of these items can be compared to the ACE results referenced in Preventing College Dropouts (Astin, 1975) or by writing to Dr. Alexander Astin, Graduate School of Education, University of California at Los Angeles, California.

4. Which statement *best* describes how you regarded your *first* full-time job? (Check one)

- ☐ (1) Employment with *definite* career potential
- ☐ (2) Employment with *possible* career potential
- ☐ (3) Employment to earn money while I decided what kind of work I wanted
- ☐ (4) Temporary employment to earn money to do something else (travel, school, have free time, etc.)
- ☐ (5) Temporary employment until something better could be found

5. How did you learn of this job: (Check *primary* source)

- ☐ (1) Was already working in it while enrolled
- ☐ (2) College placement office
- ☐ (3) Professional organization or journal
- ☐ (4) Public or private employment agency
- ☐ (5) Newspaper advertisement
- ☐ (6) Direct application to employer
- ☐ (7) Faculty referral
- ☐ (8) Referral through friend or relative
- ☐ (9) Other (please specify)

---

6. To what extent is your current job related to the major/program you were enrolled in at our college? (Check one)

- ☐ (1) Current job is not related to my major/program
- ☐ (2) Current job is somewhat related to my major/-program
- ☐ (3) Current job is specifically what I was trained for in my major/program

As an alternative to questionnaire items 1 and 2 above, one may wish to consider the following three questions which have been used by the U.S. Bureau of Census to determine the employment sector and kind of work a person is doing or has done. Responses to these questions and those pertaining to questions 4, 5, and 6 above can be compared to data the Bureau of Census collects in its annual educational attainment survey which is conducted each March. (See U.S. Bureau of Census, Current population Reports: Series P-20, "Educational Attainment in the United States.") The occupations coded in Items 1 and 2 below can come from the list of Appendix B or another categorization of the institution's choosing.

1. In what kind of business or industry was (or is) your first full-time job after leaving (Name of Institution)? (For example, accounting firm, public school, TV manufacturer)

_____ ☐☐

2. What kind of work did (or does) your first full-time job involve? (For example, accounting, teaching chemistry, electrical engineering)

_____ ☐☐

3. In your first job were you (or are you):

☐ (1) An employee of a private business?

☐ (2) Self-employed in your own business?

☐ (3) An employee in local, state, or federal government?

☐ (4) A public employee in a nongovernment organization: (For example, an environmental agency, a public school system, a public hospital)

Another alternative for questionnaire items 1 and 2 above is the following:

1. From the list that appears on page___, which entry best describes your first full-time occupation after leaving (Name of Institution)? (Please write its 2-digit code in the space below.)

   Occupation: [|] _____

ACQUISITION PROCEDURES FOR OUTCOME MEASURE F-3

Two alternative procedures are suggested for identifying the level of earnings of exiting or former students on their first job after leaving the institution. Both require the use of a survey questionnaire.

The first alternative uses an open-end question to obtain the data needed to derive this measure. Its advantages include (1) a precise identification of the respondent's actual earnings on his or her first job, and (2) data that are very conducive to statistical analysis since they can easily be computed into a mean or median amount of earnings.

The second alternative incorporates a closed-end approach. The major advantage of this alternative is that categories are already available for quick and easy analysis.

Procedures for an EXITING-STUDENT or FORMER-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

Alternative #1

1. In your first full-time job (35 hours or more a week) after leaving (Name of Institution), what is (or was) your gross salary or wage? (PLEASE FILL IN ONE)

   $ _____ (1) per year

   $ _____ (2) per week

   $ _____ (3) per hour

   _____ (4) Don't know

   (check)

Alternative #2

1. What was the starting annual salary or wage you received on your first full-time job? (Check one)

   ☐ (1) Less than $3,000 per year ($1.44 or less per hour)

   ☐ (2) $3,000 - $5,999 per year ($1.45 - $2.88 per hour)

   ☐ (3) $6,000 - $7,499 per year ($2.89 - $3.60 per hour)

   ☐ (4) $7,500 - $9,999 per year ($3.61 - $4.80 per hour)

   ☐ (5) $10,000 - $14,999 per year ($4.81 - $7.21 per hour)

   ☐ (6) $15,000 - $24,999 per year ($7.22 - $12.01 per hour)

   ☐ (7) $25,000 and above per year ($12.02 or more per hour)

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE F-4

The procedure developed for obtaining data for outcome measure F-4, Annual Total Income of Former Students, calls for the use of a survey questionnaire. The questionnaire items recommended for use in this procedure are designed to determine not only the respondent's annual salary, but also the total amount of dollars he or she has at his or her disposal at this time.

Procedure for a FORMER-STUDENT Questionnaire

[SEE FOLLOWING PAGE]

Alternative #1

1. What is the annual salary or weekly wage you earn in your current job? (PLEASE FILL IN ONE)

   $_____ (1) Per year

   $_____ (2) Per week

   $_____ (3) Per hour

   _____ (4) Not currently employed
   (check)

2. If you are married and your spouse is employed, what is the approximate annual salary or weekly wage your spouse earns in his or her current job? (PLEASE FILL IN ONE)

   $_____ (1) Per year

   $_____ (2) Per week

   $_____ (3) Per hour

   _____ (4) Not currently employed
   (check)

3. What is your current estimated annual income from other sources --such as interest earned from savings accounts and profits from rental properties? (Please write in your estimate in the space below.)

   Income from other sources = $_____/year

Alternative #2

1. Approximately what is the annual salary or weekly wage you earn in your current job? (PLEASE CHECK ONE)

- ☐ (01) Less than $3,000 per year (less than $58 per week)
- ☐ (02) $3,000 - $5,999 per year ($58 - $114 per week)
- ☐ (03) $6,000 - $8,999 per year ($115 - $172 per week)
- ☐ (04) $9,000 - $11,999 per year ($173 - $230 per week)
- ☐ (05) $12,000 - $14,999 per year ($231 - $287 per week)
- ☐ (06) $15,000 - $17,999 per year ($288 - $345 per week)
- ☐ (07) $18,000 - $20,999 per year ($346 - $403 per week)
- ☐ (08) $21,000 - $23,999 per year ($404 - $461 per week)
- ☐ (09) $24,000 - $26,999 per year ($462 - $518 per week)
- ☐ (10) $27,000 - $29,999 per year ($519 - $576 per week)
- ☐ (11) $30,000 and over per year ($577 or more per week)

2. If you are married and your spouse is employed, what is the approximate annual salary or weekly wage your spouse earns in his or her current job? (PLEASE CHECK ONE)

- ☐ (01) Less than $3,000 per year (less than $58 per week)
- ☐ (02) $3,000 - $5,999 per year ($58 - $114 per week)
- ☐ (03) $6,000 - $8,999 per year ($115 - $172 per week)
- ☐ (04) $9,000 - $11,999 per year ($173 - $230 per week)
- ☐ (05) $12,000 - $14,999 per year ($231 - $287 per week)
- ☐ (06) $15,000 - $17,999 per year ($288 - $345 per week)
- ☐ (07) $18,000 - $20,999 per year ($346 - $403 per week)
- ☐ (08) $21,000 - $23,999 per year ($404 - $461 per week)
- ☐ (09) $24,000 - $26,999 per year ($462 - $518 per week)
- ☐ (10) $27,000 - $29,999 per year ($519 - $576 per week)
- ☐ (11) $30,000 and over per year ($577 or more per week)

3. What is your current estimated annual income from other sources,--such as interest earned from savings accounts and profits from rental properties? (Please write in your estimate in the space below.)

Income from other sources = $_____/year

H-1
Measure Number

Outcome Structure Category 10.2100
10.2750

Measure Name

Students seeking additional degrees and certificates

Definition

Number and percentage of exiting or former students who have been admitted or are seeking admission to another educational program which when completed will result in a degree or certificate, by type of degree or certificate and by student major program

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot tested.

The procedure for determining this measure has been developed so that outcome measure N-7, "Number and percentage of students working toward or receiving another degree or certificate after a certain period of time," is obtained at the same time.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE H-1

Since this outcome measure, H-1, and outcome measure N-7 ("Students working toward and receiving another degree or certificate") are likely to be desired simultaneously, survey questionnaire items have been developed to obtain data for both outcome measures at the same time. Since data for the two outcome measures can be obtained for either exiting students or former students, two sets of questionnaire items are presented here.

Items for an EXITING-STUDENT Questionnaire

Item 3b requires the use of a coded list of student major program. Appendix B presents a list of educational programs that can be used by students to code their major. (The institution may instead wish to use its own list or the one used by the American College Testing Program or by the College Entrance Examination Board, in their college entrance test batteries.)

Items for a FORMER-STUDENT Questionnaire

Two alternative sets of items have been developed for inclusion in a questionnaire for former students. The first alternative is more detailed and may be more appropriate in a former-student questionnaire sent to graduates of the institution. The second alternative procedure is designed to obtain more general information about a former student's educational plans and it may be more appropriate for inclusion in a questionnaire sent to former students who have "dropped out."

Item 2 in Alternative #1 requires the use of a coded list of student major programs. Appendix B presents a list of educational programs that students can use to code their major. (The institution may instead wish to use its own list or the one used by the American College Testing Program or by the College Entrance Examination Board, in their college entrance test batteries.)

Items for an EXITING-STUDENT Questionnaire

1. Have you applied for admission to one or more educational programs (either here or at another school) which would result in your earning another degree? (Check one)

   ☐ (1) Yes, I have applied.

   ☐ (2) No, but I intend to apply within the next six months.

   ☐ (3) No, and I do not intend to apply within the next six months.

2. Have you been accepted for any of the programs to which you have applied? (Check one)

   ☐ (1) The question is not applicable to me because I have not applied to any schools.

   ☐ (2) Yes, I have been accepted.

   ☐ (3) No, all my applications have been rejected.

   ☐ (4) No, but I have not yet received a reply on all my applications.

3a. What kind of degree or certificate would result from the program(s) to which you have applied? (Check one)

   ☐ (1) Associate degree

   ☐ (2) Bachelor's degree

   ☐ (3) Master's degree

   ☐ (4) Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)

   ☐ (5) Doctorate (e.g., Ph.D., Ed.D., D.B.A.)

   ☐ (6) Other (please specify) _____

3b. From the list that appears on page __, please select the entry that most closely corresponds to the field of study that you plan to pursue, and write its 4-digit code number in the space below.

   Field of Study |_|_|_|_| _____

Items for a FORMER-STUDENT Questionnaire

Alternative #1

1. Have you applied for admission to one or more educational programs at another college or university which would result in your earning another degree or certificate? (Check one)

   ☐ (1) No, I have not applied.

   ☐ (2) Yes, I have applied and been accepted.

   ☐ (3) Yes, but I have not been accepted.

   ☐ (4) Yes, but I have not yet received a reply on all my applications.

2a. What kind of degree(s) or certificate(s) were you (or are you) seeking? (Please write in the space below a 1 if you have sought a degree or certificate but have not been awarded it, and a 2 if you have already been awarded it.)

   ☐ (1) Certificate

   ☐ (2) Diploma (Other than those listed below)

   ☐ (3) Associate degree

   ☐ (4) Bachelor's degree

   ☐ (5) Master's degree

   ☐ (6) Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)

   ☐ (7) Doctorate (e.g., Ph.D., Ed.D., D.B.A.)

   ☐ (8) Other (please specify) _____

2b. From the list that appears on page __, please select the entry that most closely corresponds to the field of study you most recently pursued (or are pursuing now), and write its 4-digit number in the space below.

   Field of Study ☐☐☐☐ _____

Alternative #1 continued

3. Are you interested in taking other courses at our college? You may include courses not presently offered by our college. (Check one)

☐ (1) No

☐ (2) Yes; what course(s) _____

_____

Alternative #2

What are your current educational plans? (Check one)

☐ (1) Have already re-enrolled at this school

☐ (2) Plan to re-enroll at this school witnin six months

☐ (3) Have already re-enrolled at another school

☐ (4) Plan to re-enroll at another school within six months

☐ (5) Have no plans to attend school within six months

H-2
Measure Number

Outcome Structure Category 10.2100

Measure Name

Highest degree or certificate planned

Definition

Number and percentage of students and/or former students identifying a certain degree or certificate as the highest planned.

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; Administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document and has been pilot tested.

This measure can be used as an indicator of the educational or competency level desired and valued by students (student educational aspirations). If collected from students at entrance, in progress, at exit, and after they have left the institution (for example, two years later), the measure can provide information about changes in the educational aspirations of students.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE H-2

Data for outcome measure H-2 can be obtained using a survey questionnaire completed by students currently enrolled in the institution, students as they are leaving, and former-students sometime after they have left. It should be noted that the questionnaire items developed for obtaining data for this measure are comparable to those used in the American Council on Education's longitudinal follow-up study of college students. As a result, comparisons can be made between the results of the ACE follow-up study and the results derived from the use of these items.

Similar items are included in the college entrance batteries of the American College Testing Program and the College Entrance Examination Board. This may mean that information already is available for entering freshmen. Furthermore, both organizations annually develop various types of norms for such variables.

Procedures for CURRENT-, EXITING-, and/or FORMER-STUDENT Questionnaires

The following items are appropriate for inclusion in questionnaires designed to obtain outcome measure H-2 from CURRENT STUDENTS, EXITING STUDENTS (program completers and noncompleters), and/or FORMER STUDENTS (graduates and nongraduates). Item #2, which asks the respondent to identify when he or she plans to complete the highest degree or certificate, should be considered optional.

Measure H-2: CURRENT-, EXITING-, and/or FORMER-STUDENT Questionnaire

FOUR-YEAR COLLEGE AND/OR UNIVERSITY

1a. Regardless of whether you are going on to another educational program at this time, what is the highest degree you eventually intend to complete? (Check one)

- ☐ (1) Associate degree
- ☐ (2) Bachelor's degree
- ☐ (3) Master's degree
- ☐ (4) Specialist degree (e.g., Ed.S.).
- ☐ (5) Professional degree (includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
- ☐ (6) Doctor's degree (e.g., Ph.D., Ed.D., D.B.A.)

COMMUNITY COLLEGE

1b. If you are planning to continue your education, what is your goal? (Check one)

- ☐ (1) I do not plan to complete an additional degree or certificate.
- ☐ (2) Certificate
- ☐ (3) Associate degree
- ☐ (4) Bachelor's degree
- ☐ (5) Specialist degree (e.g., Ed.S.)
- ☐ (6) Master's degree
- ☐ (7) Professional degree (includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
- ☐ (8) Doctor's degree (e.g., Ph.D., Ed.D., D.B.A.)

Measure H-2: CURRENT-, EXITING-, and/or FORMER-STUDENT Questionnaire continued

2. When do you expect to attain your planned highest level of education? (Please check one.)

- ☐ (1) I have already attained it.
- ☐ (2) This year (1980)
- ☐ (3) 1981
- ☐ (4) 1982
- ☐ (5) 1983
- ☐ (6) 1984
- ☐ (7) 1985
- ☐ (8) After 1986
- ☐ (9) Not sure

NOTE: When using this item, substitute the number of years ahead of the base year.

If it is desirable to know the major field of study that will be associated with the highest degree a respondent plans to complete, the following alternative item can be inserted in place of the first item presented above. Note: this item will need to be accompanied by a coded list of majors. Appendix B presents a list of education programs that can be used by students to code their major. Some institutions will prefer to use a locally developed list of majors tailored for the programs offered at that school and at the level of detail needed by various decisionmakers there, or the lists developed by the American College Testing Program or the College Entrance Examination Board for their entrance test batteries. If your institution participates in the ACT Program or the SAT Program, use of the ACT or SAT lists of majors would allow comparisons of student choices at different points in time.

FOUR-YEAR COLLEGE AND/OR UNIVERSITY

1a. Regardless of whether you are going on to another educational program at this time, what is the highest degree you eventually intend to complete? (Check one)

- ☐ (1) Associate degree
- ☐ (2) Bachelor's degree
- ☐ (3) Master's degree
- ☐ (4) Professional degree (includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
- ☐ (5) Doctor's degree (e.g., Ph.D., Ed.D., D.B.A.)

COMMUNITY COLLEGE

1b. If you are planning to continue your education, what is your goal? (Check one)

- ☐ (1) I do not plan to complete an additional degree or certificate.
- ☐ (2) Associate degree
- ☐ (3) Bachelor's degree
- ☐ (4) Master's degree
- ☐ (5) Professional degree (includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law and theology)
- ☐ (6) Doctor's degree (e.g., Ph.D., Ed.D., D.B.A.)

2. From the list that appears on page __, please select the entry that most closely corresponds to the field of study for the degree or certificate above and write its 4-digit code number in the space below.

Field of Study: ☐☐☐☐ _____

H-3
Measure Number

Outcome Structure Category 12.2100

Measure Name

Change and Stability of Career Goals

Definition

The number and percentage of former students who have maintained or changed their career goals between the time they left the institution and the present time.

Data Sources

Former Students

Procedures

Interviews; administration of a survey questionnaire.

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE H-3

One procedure recommended for obtaining data for outcome measure H-3 is the use of a survey questionnaire. The questionnaire items presented below are intended to cope with the situation in which a user has no prior information about the respondent's occupational career choice at the time the respondent left the institution.

Procedures for a FORMER-STUDENT Questionnaire

(SEE FOLLOWING PAGE)

1. The following items are intended to help us learn whether you have changed your "desired" long-run career employer and long-run career occupation since you left [Name of Institution].

   a. PLEASE CHECK ONE IN EACH COLUMN:

		Desired *EMPLOYER* When You Left [Name of Institution]	Desired *EMPLOYER* At This Time
Government:	Federal	____(01)	____(01)
	State	____(02)	____(02)
	Local	____(03)	____(03)
Education:	Elementary and Secondary	____(04)	____(04)
	Postsecondary Education	____(05)	____(05)
Other Nonprofit Organizations:	Hospitals, clinics	____(06)	____(06)
	Social Welfare	____(07)	____(07)
	Church	____(08)	____(08)
	Other nonprofit organizations	____(09)	____(09)
	Self-employed or Family Business	____(10)	____(10)
	Private Company	____(11)	____(11)
	Professional Partnership	____(12)	____(12)
	Research	____(13)	____(13)
	(Please specify) _____	____(14)	____(14

   b. From the list that appears on page __, please write in the 2-digit code of the entry that applies to each of the following two questions:

      (1) What was your desired long-run career occupation <u>when you left</u> [Name of Institution]? |__|__|

      (2) What is your desired long-run career occupation <u>at this time</u>? |__|__|

J-1
Measure Number

Outcome Structure Category 10.2330 10.2770

Measure Name

Student satisfaction with overall educational experience

Definition

The responses of students to questionnaire items measuring the degree of satisfaction with their overall college education experience

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-1

One procedure recommended for obtaining data for outcome measure J-1 is the use of a survey questionnaire. The particular set of questions suggested is a modification of a series of questions developed by C. Robert Pace and his associates in the Higher Education Measurement and Evaluation Kit (1975) to determine students' "general satisfaction with college."

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following series of questions is appropriate for use in questionnaire surveys of an institution's current students, exiting (program completers and noncompleters) students, and former students (graduates and nongraduates).

1. In general, how well do you like attending college?

   ☐ (1) I don't like it

   ☐ (2) I am more or less neutral about it

   ☐ (3) I like it

   ☐ (4) I am enthusiastic about it

2. If you could start over again, would you still choose to attend (Name of Institution)?

   ☐ (1) Definitely no

   ☐ (2) Probably no

   ☐ (3) Probably yes

   ☐ (4) Definitely yes

3. Regardless of any vocational benefit college may have for you at this point in time, do you think that being in college is a very important and beneficial experience?

   _____(1) Definitely no Why? _____

   _____(2) Generally no _____

   _____(3) Generally yes _____

   _____(4) Definitely yes _____

Outcome Structure Category 10.2270
10.2330
10.2770

J-2
Measure Number

Measure Name

Student satisfaction with vocational preparation

Definition

The responses of students to questions about the degree of satisfaction with their vocational preparation

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-2

One procedure recommended for assessing student satisfaction with vocational preparation is the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Vocational Scale," which is included in the Higher Education Measurement and Evaluation Kit (1975) developed by C. Robert Pace and his associates at the Center for Study of Evaluation, University of California, Los Angeles. The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain vocational preparation goals.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students, and former students.

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas? Please check the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Background and specialization for further education in some professional, scientific, or scholarly field	___	___	___	___
B. Basis for improved social and economic status	___	___	___	___
C. Vocabulary, terminology, and facts in various fields of knowledge	___	___	___	___
D. Skills and techniques directly applicable to a job	___	___	___	___

2. How well do you feel our college prepared you for your current job? (Check one)

☐ (1) Inadequate preparation

☐ (2) Fair preparation

☐ (3) Good preparation

Outcome Structure Category 11.2330 11.4200

J-3 Measure Number

Measure Name

Student satisfaction with college services

Definition

The responses of students to questions about the degree of satisfaction and use of services offered by this college

Data Sources

Exiting Students, Graduating Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

Although this measure was not included in the original field review document, it was pilot tested.

The purpose of this measure is to assess student satisfaction with college services. The list of services shown in the sample item is illustrative; it is recognized that each institution would have its own set of unique services.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-3

One procedure recommended for assessing student satisfaction with college services is the use of a survey questionnaire. The following questionnaire items were developed by a task force of four-year and community college administrators and was pilot tested in six institutions.

How satisfied were you with each of the college services listed below? (If you never used a particular service or the service was not available, check only the first or second column.)

	Never Used This Service	This Service Not Available	Dissatisfied	Somewhat Satisfied	Satisfied
a. Admissions Office Information	☐	☐	☐	☐	☐
b. Registration	☐	☐	☐	☐	☐
c. Financial Aid Office	☐	☐	☐	☐	☐
d. Student Employment Services While Attending College	☐	☐	☐	☐	☐
e. Job Placement Office After College	☐	☐	☐	☐	☐
f. Academic Advising (faculty)	☐	☐	☐	☐	☐
g. Academic Advising (counselors)	☐	☐	☐	☐	☐
h. Guidance and Counseling Services	☐	☐	☐	☐	☐
i. Reading, Writing, Math Skills Improvement	☐	☐	☐	☐	☐
j. Testing Services	☐	☐	☐	☐	☐
k. Career Development	☐	☐	☐	☐	☐
l. Cafeteria	☐	☐	☐	☐	☐
m. Recreation and Athletic Programs	☐	☐	☐	☐	☐
n. Library	☐	☐	☐	☐	☐
o. Health Center	☐	☐	☐	☐	☐
p. Housing Facilities	☐	☐	☐	☐	☐
q College Cultural Programs	☐	☐	☐	☐	☐
r. Minority Affairs Office	☐	☐	☐	☐	☐

Outcome Structure Category 10.2200 10.2330 10.2770

J-5 Measure Number

Measure Name

Student satisfaction with knowledge and skills in the humanities

Definition

The responses of students to questionnaire items measuring the degree of satisfaction with their knowledge and skills in the humanities, including philosophy, literature, the arts, and language

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-5

One procedure recommended for assessing student satisfaction with knowledge and skills in the humanities area is the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Humanistic Scale," which is presented in the Higher Education Measurement and Evaluation Kit developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles (1975). The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain goals related to knowledge and skills in the humanities.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students (program completers and noncompleters), and former students (graduates and nongraduates).

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

   Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Awareness of different philosophies, cultures, and ways of life.	___	___	___	___
B. Broadened literary acquaintance and appreciation.	___	___	___	___
C. Aesthetic sensitivity; Appreciation and enjoyment of art, music, drama.	___	___	___	___
D. Writing and speaking: clear, correct, effective communication.	___	___	___	___

Outcome Structure Category 10.2250 10.2330

J-6
Measure Number

Measure Name

Student satisfaction with critical thinking ability

Definition

The responses of students to questionnaire items measuring the degree of satisfaction with their ability to formulate and analyze problems

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses	Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-3

One procedure recommended for assessing student satisfaction with critical thinking ability is the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Critical Thinking Scale," which is presented in the Higher Education Measurement and Evaluation Kit developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles (1975). The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain goals related to intellectual skills and abilities.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students (program completers and noncompleters), and former students (graduates and nongraduates).

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

   Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Reasoning ability: recognizing assumptions, making logical inferences, and reaching correct conclusions.	___	___	___	___
B. Ability to see relationships, similarities, and differences between ideas.	___	___	___	___
C. Understanding the nature of science, experimentation and theory.	___	___	___	___
D. Critical thinking: ability to withhold judgment, raise questions, and examine contrary views.	___	___	___	___
E. Quantitative thinking: understanding concepts of probability, proportion, margin of error.	___	___	___	___

Outcome Structure Category 10.2260 10.2330

J-7
Measure Number

Measure Name

Student satisfaction with human relations skills

Definition

The responses of students to questionnaire items measuring the degree of satisfaction with their progress in achieving human relations skills

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses	Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-7

One procedure recommended for assessing student satisfaction with human relations skills is the use of a survey questionnaire. The questionnaire items and format used to derive this measure are a modified version of the "Educational Benefits: Human Relations Scale," which is presented in the Higher Education Measurement and Evaluation Kit developed by C. Robert Pace and his associates at the Center for the Study of Evaluation, University of California, Los Angeles (1975). The scale is intended to measure the extent to which students or former students feel their college work and experience have benefited them in achieving certain human relations skills goals.

Procedures for CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

The following scale is appropriate for use in questionnaire surveys of current students, exiting students (program competers and noncompleters), and former students (graduates and nongraduates).

1. In thinking over your educational experiences at (Name of Institution), to what extent do you think these experiences contributed to your progress in each of the following areas?

   Please check (✓) the appropriate box to the right of each category.

	(1) Very Little	(2) Some	(3) Quite A Bit	(4) Very Much
A. Personal development: understanding one's abilities and limitations, interests, and standards of behavior.	—	—	—	—
B. Development of friendships and loyalties of lasting value.	—	—	—	—
C. Appreciation of individuality and independence of thought and action.	—	—	—	—
D. Social development: experience and skill in relating to other people.	—	—	—	—
E. Tolerance and understanding of other people and their views.	—	—	—	—
F. Appreciation of religion: moral and ethical standards.	—	—	—	—

Outcome Structure Category 12.2330 12.2770 12.2840

J-8
Measure Number

Measure Name

Job satisfaction

Definition

The general satisfaction of former students with their job experiences

Data Sources

Former students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE J-8

One procedure recommended for determining job satisfaction is the use of a survey questionnaire. Interest in job satisfaction as an outcome measure could relate to a former student's satisfaction with his or her first job or with his or her current job. As a result, questionnaire items have been developed to serve both purposes. Whether both items would be used in the same questionnaire would depend on the purpose of the data collection effort.

Procedures for a FORMER-STUDENT Questionnaire

(SEE FOLLOWING PAGE)

Alternative #1: Satisfaction with first job.

1. In general, how well did you (or do you) like your first job after leaving (Name of Institution)?

   ☐ (1) I didn't (don't) like it.

   ☐ (2) I was (am) more or less neutral about it.

   ☐ (3) I liked (like) it.

   ☐ (4) I was (am) enthusiastic about it.

2. Which statement *best* describes how you regard your current *full-time* job? (Check one)

   ☐ (1) Employment with *definite* career potential

   ☐ (2) Employment with *possible* career potential

   ☐ (3) Employment to earn money while I decide what kind of work I want

   ☐ (4) Temporary employment to earn money to do something else (travel, school, have free time, etc.)

   ☐ (5) Temporary employment until I can find a job in my field

   ☐ (6) Temporary employment until I can find something better

3. To what extent was this job related to the major/program you were enrolled in at our school? (Check one)

   ☐ (1) Not related

   ☐ (2) Somewhat related

   ☐ (3) Directly related

4. Please check from the list below the principal reason why your current job is not in your major/program

   ☐ (1) I never looked for a job related to my major/program

   ☐ (2) I looked, but could not find a job related to my major/program without moving out of the geographic area.

   ☐ (3) I looked, but could not find a job related to my major/program even in other geographic areas.

   ☐ (4) I have held a job related to my major/program, but decided to get into a new employment field.

Alternative #2: Satisfaction with current job.

1. In general, how well do you like your current job?

- ☐ (1) I don't like it.
- ☐ (2) I am more or less neutral about it.
- ☐ (3) I like it.
- ☐ (4) I am enthusiastic about it.

2. Which statement *best* describes how you regard your current *full-time* job? (Check one)

- ☐ (1) Employment with *definite* career potential
- ☐ (2) Employment with *possible* career potential
- ☐ (3) Employment to earn money while I decide what kind of work I want
- ☐ (4) Temporary employment to earn money to do something else (travel, school, have free time, etc.)
- ☐ (5) Temporary employment until I can find a job in my field
- ☐ (6) Temporary employment until I can find something better

3. Is your job related to your major field of study (your program)?

- ☐ (1) Directly related
- ☐ (2) Somewhat related
- ☐ (3) Not related at all

N-1

Measure Number

Outcome Structure Category 11.2710

Measure Name

Program completers during a certain time period

Definition

The number and percentage of students completing a degree or certificate during a certain period of time; by student program

Data Sources

Institutional Student Records

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review documents, and has been pilot tested.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-1

The procedure recommended for obtaining data for outcome measure N-1 is straight forward and requires the use of institutional records.

Procedure for Use of Institutional Records

1. For a specific period of time (such as a fiscal year), identify: (1) all students who have received a degree or certificate, and (2) all students who were eligible to receive a degree or certificate but did not complete the necessary administrative steps to actually receive the award. Many institutions may not have any degree or certificate completers of this second type or may not be able to identify those they do have.
2. For each completer, identify the type of degree or certificate he or she received (or was eligible to receive):

   Certificate
   Diploma (Other than those listed below)
   Associate degree
   Bachelor's degree
   Master's degree
   Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
   Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
   Other (Please specify)_____
   Undecided

3. Next, identify the student program (bachelor's degree in genetics, a certificate in welding, and so forth) associated with the degree or certificate received by each program completer. The appropriate student category for each student should be determined according to his or her major at the time of graduation. You can

use one of the lists of occupations and educational programs presented in Appendix B or the Higher Education General Information Survey (HEGIS) discipline list in Appendix C to code the student programs identified. Although the HEGIS list designates disciplines, for purposes of this procedure the list can be used to designate student programs when appropriate.

4. Finally, identify each program completer's status when he or she entered the institution:
   a. New Undergraduate Student
   b. Transfer Undergraduate Student
   c. New Graduate Student
   d. Transfer Graduate Student
5. For a descriptive summary of the data, calculate the number and percentage of students completing a degree or certificate during the designated period of time, by type of student program and by student status at entrance.

N-2
Measure Number

Outcome Structure Category 11.271C

Measure Name

Program completers who entered as transfer students

Definition

Number and percentage of students who entered as transfer students earning a degree or certificate during a certain period of time by status at entrance

Data Sources

Institutional Student Records; Students

Procedures

Search of Institutional Records; Interviews; Administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review documents, and has been pilot tested

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-2

The procedure developed for obtaining data for outcome measure N-1 should be used to obtain the data for this outcome measure, N-2. If a question is desired to identify transfer students, the following question should be used.

Did you transfer credits from another college or university toward this certificate or degree? (Check one)

☐ (1) Yes

☐ (2) No

N-3
Measure Number

Outcome Structure Category 11.2710

Measure Name

Degrees and certificates earned by an entering class of students

Definition

Number and percentage of students in a designated entering class who have earned a degree or certificate from the institution within a certain period of time, by type of degree or certificate, student status at entrance, and student program (field of study)

Data Sources

Institutional Records of a Designated Entering Class of Students (e.g., the entering class of 1970)

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

Measures N-3 and N-1 differ in that N-3 identifies the success an entering class has had in completing their degree or certificate programs whereas N-1 identifies those students earning a degree or certificate during a given period of time with no consideration of when they entered the institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-3

The procedures developed for acquiring data for outcome measure N-3 are based on the use of institutional records. It should be noted that in addition to being appropriate for identifying the number and percentage of students in an entering class who have graduated or are expected to graduate in a certain period of time, the procedures also identify those students in an entering class (1) who are currently enrolled in the institution and (2) who have left the institution without receiving a degree or certificate.

Procedure for Use of Institutional Records

1. Select the entering class to be studied. Categorize students in the entering class in terms of their student status at entrance:
   a. New Undergraduate Students
   b. Transfer Undergraduate Students
   c. New Graduate Students
   d. Transfer Graduate Students
2. Determine the cut-off date to be used in obtaining data for outcome measure B-5.
3. Examine student records for the selected entering class and identify:
   a. Those students who have earned a degree or certificate by cut-off date. Students who are eligible to receive a degree or certificate but who have not completed the necessary administrative steps to actually receive the award should be included.

b. Those students who are currently enrolled in the institution.

c. Those students who left the institution prior to completion of a degree or certificate. (This group of students would include those who have left permanently and those who may return.)

4. Identify the type of degree or certificate earned by each program completer:

Certificate
Diploma (Other than those listed below)
Associate degree
Bachelor's degree
Master's degree
Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
Other (Please specify)_____
Undecided

5. Next identify the student major program (bachelor's degree in genetics, a certificate in welding, and so forth) for each completer. The appropriate student major program category for each student should be determined according to his or her major at the time of graduation. You can use one of the lists of occupations and educational programs presented in Appendix B or the Higher Education General Information Survey (HEGIS) discipline list in Appendix C to code the student programs identified. Although the HEGIS list designates disciplines, for purposes of this procedure the list can be used to designate student programs when appropriate.

6. For a descriptive summary of the data, calculate the number and percentage of students in the selected entering class who have earned a degree or certificate within the designated period of time, by their status at entrance and their major at graduation.

N-4
Measure Number

Outcome Structure Category 11.2710

Measure Name

Time to program completion for a graduating class

Definition

Amount of time it takes a student in a particular graduating class to earn a degree or certificate, by degree or certificate type, student major program, and a student status at entrance

Data Sources

Institutional Student Records

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-4

The procedure recommended for obtaining data for outcome measure N-4, "Amount of time it takes a student in a particular graduating class to earn a degree or certificate," requires the use of student institutional records. It is important to note that this procedure does not distinguish graduates who have been enrolled on a continuous basis from those who have been enrolled on an intermittent basis. Also, the procedure does not delineate graduates who have always been full-time students from those who, at one time or another, have been part-time enrollees. If these distinctions are important, the following steps will need to be modified accordingly.

Procedure for Use of Institutional Records

1. Select the graduating class to be studied.
2. Examine institutional records for students in the graduating class and identify student status at entrance for each student:
   a. New Undergraduate Student
   b. Transfer Undergraduate Student
   c. New Graduate Student
   d. Transfer Graduate Student
3. Identify for each student the total number of months elapsed from entry date to graduation date and/or the total number of terms enrolled (summer terms and special sessions inlcuded) from entry date to graduation date.

4. Determine for each student in the study:

   a. Type of degree or certificate earned:

      Certificate
      Diploma (Other than those listed below)
      Associate degree
      Bachelor's degree
      Master's degree
      Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
      Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
      Other (Please specify)_____
      Undecided

   b. Major program at graduation:

      Appendix B presents alternative lists of occupations and educational programs that can be used to code each graduating student's major program.

5. Data now are available to calculate the median or mean number of months elapsed and/or the median or mean number of terms enrolled by:

   a. Type of degree or certificate earned

   b. Student major program at graduation

   c. Student status at entrance

N-5
Measure Number

Outcome Structure Category 11.2710

Measure Name

Time to program completion for an entering class

Definition

Amount of time it takes a student in a particular entering class to earn a degree or certificate, by degree or certificate type, student major program, and student status at entrance

Data Sources

Institutional Student Records

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

The procedures suggested for obtaining data for this measure allow as the basic unit of measurement either total number of months elapsed from entry date to graduation or total number of academic terms enrolled in that period of time.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-5

The procedure developed for obtaining data for outcome measure N-5. "Amount of time it takes a student in a particular entering class to earn a degree or certificate," involves the use of student institutional records. It is important to note that this procedure does not distinguish graduates who have been enrolled on a continuous basis from those who have been enrolled on an intermittent basis. Also, the procedure does not delineate graduates who have always been full-time students from those who, at one time or another, have been part-time enrollees. If these distinctions are important, the following steps will need to be modified accordingly.

Procedure for Use of Insitutitutional Records

1. Select entering class to be studied (for example, all new undergraduate students who entered Fall term of 1970).
2. Examine institutional records for the students in the designated entering class:
   a. Identify those students who have graduated or are expected to graduate by the specified cut-off date (such as Spring 1975).
   b. Identify for each student identified in step a:
      (1) total number of months elapsed from entry date to graduation date, and/or
      (2) total number of terms enrolled (summer terms and special sessions included) from entry date to graduation date.

c. Determine for each student in the study:

(1) Student status at entrance:

New Undergraduate Student

Transfer Undergraduate Student

New Graduate Student

Transfer Graduate Student

(2) Type of degree or certificate earned:

Certificate
Diploma (Other than those listed below)
Associate degree
Bachelor's degree
Master's degree
Professional degree (Includes only dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology)
Doctorate (e.g., Ph.D., Ed.D., D.B.A.)
Other (Please specify)_____
Undecided

(3) Major program at graduation:

Appendix B presents alternative lists of occupations and educational programs that can be used to code each student's major program at time of graduation.

3. Data now are available to calculate the median or mean number of months elapsed and/or the median or mean number of terms enrolled for each graduating student in the designated entering class by:

a. Student status at entrance

b. Type of degree or certificate earned

c. Student major program at graduation

Outcome Structure Category 11.2710 11.2770

N-6
Measure Number

Measure Name

Educational program dropouts

Definition

The number and percentage of full-time students in degree or certificate programs who left the institution prior to completion of their program, by student level and exit status

Data Sources

Former full-time students who were seeking a degree or certificate but "dropped out" of the institution

Procedures

Search of Institutional Records

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

The procedures that follow are not applicable to students enrolled in certificate programs that are conducted for periods of time not synonymous with regular academic sessions (e.g., a special five-week certificate program).

The information obtained for this measure should be reviewed along with information about the number of continuing and readmitted students. In combination, these measures can provide general information about the pattern of student attendance at the institution over a short period of time.

(Comments continued)

Comments N-6 continued.

The procedure for this measure can be used to identify the group of former students who should be surveyed regarding their reasons for leaving the institution before completing their program.

NCHEMS Information Exchange Procedures Outcomes Study Procedures (Technical Report No. 66) contains a slightly modified version of the data acquisition procedures recommended for this outcome measure.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-6

The procedure recommended for obtaining data for outcome measure N-6 requires the use of institutional records. An advantage of the procedure is that it establishes a defined period of time that determines when a student should be classified as a dropout.*

Procedure for Use of Institutional Records

1. Identify all students in degree and certificate programs who were enrolled full-time at the institution at one of the following point(s) in time prior to the current Fall term:
   a. The previous semester if the institution is on a semester system with no summer session (for example, the previous semester);
   b. For at least one of the previous two terms if the institution is on a semester system in which a summer session is a regular term (for example, the previous Summer semester or Spring semester); if the summer session is divided into a number or parts, attendance during one part constitutes enrollment for the term;
   c. The previous semester if the institution is on a 4-1-4 system;
   d. For at least one of the previous two terms if the institution is on a trimester system;

*This time period can be varied depending upon the interests of the user of this procedure.

e. The previous quarter if the institution is on a quarter system with three quarters and no summer sessions (for example, the previous Spring quarter);

f. For at least one of the two previous terms if the institution is on a quarter system with four quarters or three quarters and a summer session where the summer session is considered a regular term (for example, the previous Summer or Spring quarter); if the summer is divided into a number of parts, attendance during one part constitutes enrollment for the term.

2. For each student identified above, identify those who did not complete a program prior to the current Fall term.

3. For the program noncompleters identified in step 2, determine those who are not enrolled at the institution in the current Fall term. Determination of enrollment should be made as of the census date for the Fall term at the institution.

4. For each of the students identified in step 3, determine his or her status at the institution as of the end of the last term he or she was enrolled:

   a. In Good Standing

   b. Not in Good Standing

      (1) Academically Dropped or Suspended

      (2) Other

5. For each of the students identified in step 3, determine his or her student level as of the end of the last term he or she was enrolled:

   a. Lower Division

   b. Upper Division

   c. Graduate

6. Data should now be available to calculate the number and percentage of full-time students in degree or certificate programs who left the institution during the designated time period prior to completion of their program, by student level and status at termination.

Outcome Structure Category 10.2100 10.2710

N-7
Measure Number

Measure Name Student working toward and receiving another degree or certificate

Definition

Number and percentage of exiting or former students who are working toward or have received another degree or certificate, by degree/diploma/certificate type and by student major program

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses	Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE N-7

The questionnaire items developed for obtaining data for outcome measure H-1 should also be used to obtain the data necessary to derive this outcome measure, N-7.

N-8
Measure Number

Outcome Structure Category 10.2720 25.2730

Measure Name

Student ability to transfer credits

Definition

Number and percentage of exiting and/or former students who have successfully transferred credits to another school

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey Questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and it has been pilot tested. It and outcome measure N-9 may be useful as indicators of the difficulty and/or success of former students who have enrolled in another institution.

If the procedures for this measure are used in an EXITING-STUDENT Questionnaire, it would be appropriate to include them in the section of the questionnaire that contains the exiting students' responses concerning whether they have been admitted or are seeking admission to another progra . (See outcome measures H-1 and N-7.)

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURES N-8

One of the procedures for identifying student success in transferring credits to another institution is the use of a survey questionnaire. Two alternative sets of items are presented. For the Alternative #1 set, the first item identifies whether the respondent attempted to transfer any credits. The second question identifies reasons why respondents were not successful in transferring credits. The second set of items does not speak to credits transfer only; it speaks to any problems in transferring.

Concerning both item sets, it should be noted that this sequence of questions usually would be asked after it was determined that the respondent had been admitted to or was attending another school. Also, it is assumed that the school to which the respondent has transferred will be identified by the respondent in the questionnaire.

Alternative #1

1. Did you try to transfer credits from [Name of Institution] when you were admitted to your new program? (PLEASE CHECK ONE)

   ☐ (1) Yes, and they were all accepted. (SKIP TO QUESTION ___)

   ☐ (2) Yes, but some credits were not accepted. (GO TO QUESTION 2)

   ☐ (3) Yes, but none of the credits were accepted. (GO TO QUESTION 2)

   ☐ (4) No. (SKIP TO QUESTION ___)

2. What was the major reason that the credits were not accepted? (PLEASE CHECK ONE)

   ☐ (1) Don't know

   ☐ (2) No comparable course

   ☐ (3) Switched fields of study

   ☐ (4) Limit on transfer of credits

   ☐ (5) The institution does not accept transfer credits

   ☐ (6) Other (Please explain) _____

   _____

Alternative #2

Did you have any difficulty in transferring when you enrolled for this new college/university program? (Check one)

☐ (1) No, I did not experience difficulty in transferring.

☐ (2) Yes, I experienced difficulty in transferring. Please briefly indicate the nature of the difficulty.

_____

_____

_____

N-9
Measure Number

Outcome Structure Category 12.2720 12.2770 25.2730

Measure Name

Level of achievement of former students in another institution

Definition

Number and percentage of former students achieving a certain gradepoint average in another institution

Data Sources

Former Students

Procedures

Administration of a Survey Questionnaire; reports from other institutions

Uses

Institutional	State

Comments

This measure was included in the original field review document, and it has been pilot tested.

This measure and outcome measure N-8 could be useful also as indicators of the success of former students who have enrolled in another institution.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE N-9

The success former students have in achieving an acceptable gradepoint average at another school is often determined from grade reports sent by the schools in which the former students enroll. However, in many instances such reports are not available. As a result, the following questionnaire items have been developed to obtain data for outcome measure N-9 using a survey questionnaire for former students (graduates and nongraduates).

Procedures for a FORMER-STUDENT Questionnaire

(SEE FOLLOWING PAGE)

N-10
Measure Number

Outcome Structure Category 11.2770

Measure Name

Student status at withdrawal time

Definition

Characteristics of students that have withdrawn from the institution before completing a program

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire; search of institutional records

Uses

Institutional	State

Comments

Although this measure was not in the original field review document, it has been pilot tested.

The purpose of this measure is to describe relevant academic status characteristics of students who withdraw from the institution prior to completion of a program.

1. How many college credits have you earned since you left [Name of Institution]?

a. Undergraduate Credits

- ☐ (1) None
- ☐ (2) Less than 10 sem. hrs. (15 qtr. hrs.)
- ☐ (3) 10-19 sem. hrs. (15-29 qtr. hrs.)
- ☐ (4) 20-29 sem. hrs. (30-44 qtr. hrs.)
- ☐ (5) 30-39 sem. hrs. (45-59 qtr. hrs.)
- ☐ (6) 40-49 sem. hrs. (60-74 qtr. hrs.)
- ☐ (7) 50 sem. hrs. or more (75 qtr. hrs. or more)

b. Graduate Credits

- ☐ (1) None
- ☐ (2) Less than 10 sem. hrs. (15 qtr. hrs.)
- ☐ (3) 10-19 sem. hrs. (15-29 qtr. hrs.)
- ☐ (4) 20-29 sem. hrs. (30-44 qtr. hrs.)
- ☐ (5) 30-39 sem. hrs. (45-59 qtr. hrs.)
- ☐ (6) 40-49 sem. hrs. (60-74 qtr. hrs.)
- ☐ (7) 50 sem. hrs. or more (75 qtr. hrs. or more)

2. What grade point average have you attained while earning these credits? (A 4.00 G.P.A. is equivalent to a straight "A" average.)

a. Undergraduate G.P.A.

- ☐ (1) Less than 1.00
- ☐ (2) 1.00 - 1.49
- ☐ (3) 1.50 - 1.99
- ☐ (4) 2.00 - 2.49
- ☐ (5) 2.50 - 2.99
- ☐ (6) 3.00 - 3.49
- ☐ (7) 3.50 - 3.99
- ☐ (8) 4.00
- ☐ (9) Not applicable

b. Graduate G.P.A.

- ☐ (1) Less than 1.00
- ☐ (2) 1.00 - 1.49
- ☐ (3) 1.50 - 1.99
- ☐ (4) 2.00 - 2.49
- ☐ (5) 2.50 - 2.99
- ☐ (6) 3.00 - 3.49
- ☐ (7) 3.50 - 3.99
- ☐ (8) 4.00
- ☐ (9) Not applicable

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-10

The procedure recommended for obtaining data for outcome measure N-10 is to search institutional records to obtain the data. The following questionnaire items are provided for colleges that are not able to obtain the information from their existing records.

1. What was your cumulative grade point average at the time you left this school? (Check one)

   ☐ (1) 1.0 or less

   ☐ (2) 1.1 to 2.0

   ☐ (3) 2.1 to 3.0

   ☐ (4) 3.1 to 4.0

2. Were you ever on academic probation while enrolled? (Check one)

   ☐ (1) Yes

   ☐ (2) No

3. How long were you enrolled before you left this school? (Check one)

   ☐ (1) Less than one term

   ☐ (2) One term, but less than one year

   ☐ (3) One year or more, but less than two years

   ☐ (4) Two years or more, but less than three years

   ☐ (5) Three years or more

4. Were you primarily a full-time (12 hours or more) or part-time student while you attended this school? (Check one)

- ☐ (1) Primarily full-time
- ☐ (2) Primarily part-time

5. During your last two terms at this school, were you employed in a job for which you received wages? (Check one)

- ☐ (1) Not employed at all
- ☐ (2) Employed 1-10 hours/week
- ☐ (3) Employed 11-20 hours/week
- ☐ (4) Employed 21-35 hours/week
- ☐ (5) Employed 36 hours or more/week

6. Check all the sources of support you used to finance your last two terms of school.

- ☐ (1) Full- or part-time work while attending school
- ☐ (2) Savings
- ☐ (3) Support from parents
- ☐ (4) Employer support
- ☐ (5) Aid from spouse
- ☐ (6) Grants (Basic Opportunity Grant, Supplemental Educational Opportunity Grant, and others)
- ☐ (7) Loans
- ☐ (8) Scholarship
- ☐ (9) GI Benefits, Social Security, and other benefits

N-11

Measure Number

Outcome Structure Category 11.2400 11.2700

Measure Name

Reasons for students withdrawing from the institution before completing a program

Definition

The responses of students to questions about their reasons for leaving the institution

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

Although this measure was not in the original field review document, it has been pilot tested.

The purpose of this measure is to collect in a systematic way information in the academic, financial, employment, and personal areas about why students are withdrawing or have withdrawn from the institution.

ACQUISITION PROCEDURES FOR OUTCOME MEASURE N-11

The procedure recommended for assessing students' reasons for leaving the institution before completing a program calls for the use of an exit interview or a survey questionnaire. The particular questions presented here were developed and pilot tested for the NCHEMS Student Attrition Study. They were revised in light of the results of that pilot test and an evaluation by two-year colleges and four-year colleges task force representatives.

1. Listed below are some academic, employment, financial, and personal reasons why a student might leave college. To what extent are these your reasons for leaving this college? (Check one answer for each reason.)

	Not a Reason	Moderate Reason	Major Reason
Academic			
a. Needed a temporary break from studies	☐	☐	☐
b. Major or courses not available at this college	☐	☐	☐
c. Dissatisfaction with major department	☐	☐	☐
d. Unsure about my choice of major	☐	☐	☐
e. Course work not challenging	☐	☐	☐
f. Low grades	☐	☐	☐
g. Found courses too difficult	☐	☐	☐
h. Inadequate study techniques or habits	☐	☐	☐
i. Dissatisfied with quality of teaching	☐	☐	☐
Employment			
j. Scheduling conflict between job and studies	☐	☐	☐
k. Accepted a job	☐	☐	☐
l. Went into military service	☐	☐	☐
m. Couldn't find a job while in college	☐	☐	☐
Financial			
n. Not enough money to go to college	☐	☐	☐
o. Applied, but could not obtain financial aid	☐	☐	☐
p. Financial aid was not sufficient	☐	☐	☐
q. Child care too costly	☐	☐	☐
r. This college was too expensive	☐	☐	☐
Personal Circumstances			
s. Found study too time-consuming	☐	☐	☐
t. Home responsibilities were too great	☐	☐	☐
u. Illness, personal or family	☐	☐	☐
v. Personal problems	☐	☐	☐
w. Fulfilled my personal educational goals	☐	☐	☐
x. Marital situation changed my educational plans	☐	☐	☐
y. Moved out of the area	☐	☐	☐
z. Child care not available	☐	☐	☐

2. Looking at the list in question 1, please select the three most important reasons why you did not return to our college this term. (List, in order of importance, the appropriate letter [a, b, c, etc.] in the boxes below.)

First ☐ Second ☐ Third ☐

3. If you left our college because of dissatisfaction with some aspect of it, please write in the space below what we could have done to encourage you to stay in college.

_____

_____

_____

_____

4. Please write in the space below the one thing which, if changed for the better, would have encouraged you to stay at this school.

_____

_____

_____

_____

Outcome Structure Category 12.2750 12.2840

N-17
Measure Number

Measure Name

Employment in major field of study

Definition

Number and percentage of exiting or former students who are employed in a job related to their program of study

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses	Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE N-17

One procedure for obtaining data for outcome measure N-17 is the use of a survey questionnaire. The questionnaire items used to obtain the necessary data should be included in the section of an EXITING-STUDENT or FORMER-STUDENT Questionnaire that relates to occupational career information.

Procedure for an EXITING-STUDENT or FORMER-STUDENT Questionnaire

The following set of items assumes that a respondent has indicated he or she has a job.

STUDENT STATUS, RECOGNITION, AND CERTIFICATION OUTCOME MEASURES

Alternative #1

1. To what extent is your current job related to the major/program you were enrolled in at our college? (Check one)

   ☐ (1) Current job is not related to my major/program

   ☐ (2) Current job is somewhat related to my major/program

   ☐ (3) Current job is specifically what I was trained for in my major/program

2. How well do you feel our college prepared you for your current job? (Check one)

   ☐ (1) Inadequate preparation

   ☐ (2) Fair preparation

   ☐ (3) Good preparation

3. If you answered "1" for Item 1, did you ever look for a job related to your major/program? (Check one)

   ☐ (1) Yes

   ☐ (2) No

4. If you answered "1" for Item 1, are you willing to move to another community to get a job in the field for which you were trained? (Check one)

   ☐ (1) Yes

   ☐ (2) No

5. If you answered "1" for Item 1, please check from the list below the principal reason why your current job is not in your major/program.

   ☐ (1) I never looked for a job related to my major/program

   ☐ (2) I looked, but could not find a job related to my major/program without moving out of the geographic area.

   ☐ (3) I looked, but could not find a job related to my major/program even in other geographic areas.

   ☐ (4) I have held a job related to my major/program, but decided to get into a new employment field.

   ☐ (5) Other (Please specify) _____

1. Is your job related to your major field of study (your major program)?

- ☐ (1) Directly related
- ☐ (2) Somewhat related
- ☐ (3) Not related at all

2. How well do you feel your studies at [Name of Institution] prepared you for this job?

- ☐ (1) Inadequate preparation
- ☐ (2) Fair preparation
- ☐ (3) Good preparation

3. If you are employed outside your major field of study at [Name of Institution], why? (CHECK ALL THAT APPLY)

- ☐ (1) Never really planned to work in my major field
- ☐ (2) Tried but could not find a job in my major field
- ☐ (3) Did not feel I learned enough in my major field
- ☐ (4) Decided I did not like the work in my major field
- ☐ (5) Too little opportunity for advancement in my major field
- ☐ (6) Developed new career interest
- ☐ (7) Better job opportunity came along
- ☐ (8) Other (Please specify) _____

N-22

Measure Number

Outcome Structure Category 10.2740 25.2730

Measure Name

Student success in passing certification and licensing examinations

Definition

Name and percentage of students and/or former students passing certification, licensing, or qualification examinations (e.g., Bar Exam, CPA Exam, LPN Exam)

Data Sources

Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

Although the administration of a survey questionnaire is the acquisition procedure suggested for obtaining data for outcome measure N-22, it is recognized that the data necessary for this measure often can be obtained from the agencies or organizations that administer the exams.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE N-22

One procedure recommended for determining student success in passing certification and licensing examinations involves the development and use of a survey questionnaire. Because data for this measure can be obtained from students as they leave the institution and from former students sometime after they have left, one set of questionnaire items has been developed for inclusion in an EXITING-STUDENT Questionnaire and another set for inclusion in a FORMER-STUDENT Questionnaire.

Procedures for an EXITING-STUDENT Questionnaire

The following item, which was developed for inclusion in an EXITING-STUDENT Questionnaire to obtain data for outcome measure N-22, can be used in questionnaires designed to survey program completers as well as program noncompleters. It should be noted, however, that this item could be used also to survey students not in degree, diploma, certificate programs; that is, nonmatriculating students. If such information would be helpful, a question could be added that asks them to identify the exam(s), if they checked 2, 3, or 4.

Have you taken any licensing or certification examinations (for example: real estate exam, nursing exam, or bar exam) since graduating from our school? (Check one)

- ☐ (1) No, and I do not plan to take any
- ☐ (2) No, I have not taken any exams, but plan to do so
- ☐ (3) Yes, I have taken an exam and passed
- ☐ (4) Yes, I have taken an exam, but I did not pass
- ☐ (5) Yes, I have taken an exam, but I do not know the results yet

Procedures for a FORMER-STUDENT Questionnaire

The following questionnaire item is intended for use in obtaining outcome measure N-22 from former students regardless of whether or not they completed their program. If such information would be helpful, a question could be added that asks them to identify the exam(s), if they checked 2, 3, or 4.

Have you taken any employment licensing or certification examination since leaving our college? (Check one)

- [ ] (1) No, and I do not plan to take any
- [ ] (2) No, I have not taken any exams
- [ ] (3) Yes, I have taken an exam and passed
- [ ] (4) Yes, I have taken an exam, but I did not pass
- [ ] (5) Yes, I have taken an exam, but I do not know the results yets

Outcome Structure Category 10.2100 10.2840

0-1
Measure Number

Measure Name

Occupation Career Choice

Definition

Number and percentage of students choosing a particular occupational career (that is, their employment goals)

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Interviews; administration of a survey questionnaire

Uses

Institutional	State

Comments

This measure was included in the original field review document, and has been pilot tested.

QUESTIONNAIRE ITEMS FOR OUTCOME MEASURE O-1

One procedure recommended for obtaining data for outcome measure O-1 is the use of a survey questionnaire. Two alternative sets of questionnaire items have been developed for use in a survey of current students, exiting students, or former students (graduates and nongraduates).

Procedures for a CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire

Two alternative sets of questionnaire items are presented for inclusion in a CURRENT-, EXITING-, or FORMER-STUDENT Questionnaire. Alternative #1 can be used if one is interested in knowing about the respondent's long-run career employer and the specific job position the respondent hopes to enter in his or her long-run occupational career. Alternative #2 can be useful if one is interested in knowing the respondent's intentions regarding his or her long-run career employer and the job activities the respondent intends to engage in during his or her long-run career. An advantage of the second alternative set of items is that they are compatible with those used in the American Council on Education's longitudinal follow-up studies on college students. As a result, the results obtained from the use of these items can be compared to the ACE results referenced in Preventing College Dropouts (Astin, 1975) or by writing to Dr. Alexander Astin, Graduate School of Education, University of California at Los Angeles, California.

Alternative #1

1. We would like to find out about your long-run occupational career goals.

   a. Over the long-run, in which employment sector are you primarily interested in working? (PLEASE CHECK ONE)

		Long-run Career Employe.
Government:	Federal	___ (01)
	State	___ (02)
	Local	___ (03)
Education:	Elementary and Secondary	___ (04)
	Higher Education	___ (05)
Other Nonprofit Organizations:	Hospitals, clinics	___ (06)
	Social Welfare	___ (07)
	Church	___ (08)
	Other nonprofit organizations	___ (09)
Business and Service:	Self-employed or family business	___ (10)
	Private Company	___ (11)
	Professional partnership	___ (12)
	Research	___ (13)
Other:	Please specify _____	___ (14)

   b. From the list that appears on page __, which entry best describes your expected long-run career work? (Please write its 3-digit code in the space below.)

      Long-run Occupational Career: |__|__|__|

      _____

   c. How sure are you of your choice in "b ?

      ☐ (1) Quite sure

      ☐ (2) Somewhat sure

      ☐ (3) Not sure

Alternative #2

1. We would like to find out about your long-run occupational career goals and activities:

   a. In the long-run, whom do you expect will be your career employer? (PLEASE CHECK ONE)

		Long-run Career Employer	
Government:	Federal	☐	(01)
	State	☐	(02)
	Local	☐	(03)
Education:	Elementary and Secondary	☐	(04)
	Higher Education	☐	(05)
Other Nonprofit Organizations:	Hospitals, clinics	☐	(06)
	Social Welfare	☐	(07)
	Church	☐	(08)
	Other nonprofit organizations	☐	(09)
Business and Service:	Self-employed or family business	☐	(10)
	Private Company	☐	(11)
	Professional partnership	☐	(12)
	Research	☐	(13)
Other:	Please specify _____	☐	(14)

   b. How much of your long-run career work do you expect will be devoted to each of the following job activities? (Please check one for each activity.)

Job Activities	Long-run Career Work (1) A Major Amount	(2) A Minor Amount	(3) None
A. Teaching	___	___	___
B. Research and Development	___	___	___
C. Administration or Management	___	___	___
D. Service to customers, patients, or clients	___	___	___
E. Other (Specify) _____ _____	___	___	___

P-1
Measure Number

Outcome Structure Category 10.3100 25.2730

Measure Name

Tested breadth of knowledge and understanding

Definition

Student scores or change in scores on standardized or instructor-developed tests that indicate development in their breadth of knowledge and understanding about facts, terminology, principles, processes, and/or theory across several broad fields of study (the humanities, the physical sciences, etc.)

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Administration of standardized achievement tests; administration of locally-developed achievement tests

Uses

Institutional	State

Comments

This measure was included in the original field review document

ACQUISITION PROCEDURES FOR OUTCOME MEASURE P-1

The data acquisition procedures most widely used to assess student development in their breadth of knowledge and understanding is the survey achievement test. (Some institutions and program staffs developed their own survey tests of knowledge because available standardized tests do not measure what is emphasized in their courses and programs.) Generally, such tests represent a standardized package of separate tests that cover the basic knowledge and skill components of the curriculum. Because a variety of standardized achievement tests already have been developed, NCHEMS has chosen to recommend their use in obtaining data for outcome measure P-1. Probably the best source of information for deciding which achievement test best fits the situation in which it will be used is the series of Mental Measurements Yearbooks developed by Oscar K. Buros (1938, 1941, 1949, 1953, 1959, 1965, 1972, 1978). The following achievement test batteries, which may be useful in obtaining outcome measure A-1, are reviewed in Volume I of the seventh edition of the Mental Measurement Yearbook:

- Adult Basic Education Student Survey (Follet Educational Corporation, 1966-67)
- Adult Basic Learning Examination (Harcourt, Brace, Jovanovich, Inc., 1967-71)
- College-Level Examination Program General Examination (College Entrance Examination Board, 1970)
- Survey of College Achievement (Educational Testing Service, 1966-69)
- Tests of General Educational Development (The American Council on Education, 1970)
- The Undergraduate Record Examinations: Area Tests (Educational Testing Service, 1954-70)

Q-1
Measure Number

Outcome Structure Category 10.3200 25.2730

Measure Name

Tested specialized knowledge and understanding

Definition

Student scores or change in scores from pre-test to post-test on standardized or instructor-developed tests that indicate development in their depth of knowledge and understanding concerning facts, terminology, principles, processes, and/or theory in the particular fields in which students elect to study

Data Sources

Current Students, Exiting Students, Former Students

Procedures

Administration of standardized achievement tests; administration of locally-developed achievement tests

Uses

Institutional	State

Comments

This measure was included in the original field review document

ACQUISITION PROCEDURES FOR OUTCOME MEASURE Q-1

Numerous standardized achievement tests have been developed to help assess student knowledge and skill development in special areas of study. Because of their existence, NCHEMS recommends their use in obtaining data for outcome measure A-2. As is true for outcome measure A-1, Burros' Mental Measurements Yearbooks (1938, 1941, 1949, 1953, 1959, 1965, 1972, 1978) are probably the best source of information for deciding which achievement tests best fit the situation in which they will be used.

Where standardized tests do not measure the specialized knowledge emphasized in a program or course, locally-developed tests should be used. This is a quite common situation, and such tests are generally for most courses and programs at most institutions. The reliability and validity of these tests should be evaluated, however, before much faith is placed in them. Volumes I and II of the seventh edition of the Mental Measurements Yearbook list standardized instruments for the following specialized fields of study:

- English
- Fine Arts
- Foreign Languages
- Mathematics
- Business Education
- Education
- Health and Physical Education
- Home Economics
- Industrial Arts
- Philosophy
- Psychology
- Religious Education
- Reading
- Biology
- Chemistry
- Geology
- Physics
- Economics
- Geography
- History
- Political Science
- Sociology
- Speech and Hearing
- Accounting
- Business
- Computer Programming
- Dentistry
- Engineering
- Law
- Medicine
- Nursing
- Selling
- Skill Trades
- Supervision
- Transportation

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APPENDIX A

Outline of the NCHEMS Outcomes Structure and Its Audience and Type-of-Outcome Categories

CODED LISTING OF THE SECOND- AND THIRD-LEVEL SUBCATEGORIES FOR EACH FIRST-LEVEL CATEGORY OF THE TYPE-OF-OUTCOME DIMENSION[a]

Category Code Number	Entity Being Maintained or Changed
1000	*ECONOMIC OUTCOMES*
1100	Economic Access and Independence Outcomes
1110	Economic Access
1120	Economic Flexibility, Adaptability, and Security
1130	Income and Standard of Living
1200	Economic Resources and Costs
1210	Economic Costs and Efficiency
1220	Economic Resources (including employees)
1300	Economic Production
1310	Economic Productivity and Production
1320	Economic Services Provided
1400	Other Economic Outcomes
2000	*HUMAN CHARACTERISTIC OUTCOMES*
2100	Aspirations
2110	Desires, Aims, and Goals
2120	Dislikes, Likes, and Interests
2130	Motivation or Drive Level
2140	Other Aspirational Outcomes
2200	Competence and Skills
2210	Academic Skills
2220	Citizenship and Family Membership Skills
2230	Creativity Skills
2240	Expression and Communication Skills
2250	Intellectual Skills
2260	Intsrpersonal, Leadership, and Organizational Skills
2270	Occupational and Employability Skills
2280	Physical and Motor Skills
2290	Other Skill Outcomes
2300	Morale, Satisfaction, and Affective Characteristics
2310	Attitudes and Values
2320	Beliefs, Commitments, and Philosophy of Life
2330	Feelings and Emotions
2340	Mores, Customs, and Standards of Conduct
2350	Other Affective Outcomes
2400	Perceptual Characteristics
2410	Perceptual Awareness and Sensitivity
2420	Perception of Self
2430	Perception of Others
2440	Perception of Things
2450	Other Perceptual Outcomes
2500	Personality and Personal Coping Characteristics
2510	Adventurousness and Initiative
2520	Autonomy and Independence
2530	Dependability and Responsibility
2540	Dogmatic/Open-Minded, Authoritarian/Democratic
2550	Flexibility and Adaptability
2560	Habits
2570	Psychological Functioning
2580	Tolerance and Persistence
2590	Other Personality and Personal Coping Outcomes
2600	Physical and Physiological Characteristics
2610	Physical Fitness and Traits
2620	Physiological Health
2630	Other Physical or Physiological Outcomes
2700	Status, Recognition, and Certification
2710	Completion or Achievement Award
2720	Credit Recognition
2730	Image, Reputation, or Status
2740	Licensing and Certification
2750	Obtaining a Job or Admission to a Follow-up Program
2760	Power and/or Authority
2770	Job, School, or Life Success
2780	Other Status, Recognition, and Certification Outcomes
2800	Social Activities and Roles
2810	Adjustment to Retirement
2820	Affiliations
2830	Avocational and Social Activities and Roles
2840	Career and Vocational Activities and Roles
2850	Citizenship Activities and Roles
2860	Family Activities and Roles
2870	Friendships and Relationships
2880	Other Activity and Role Outcomes
2900	Other Human Characteristic Outcomes
3000	*KNOWLEDGE, TECHNOLOGY, AND ART FORM OUTCOMES*
3100	General Knowledge and Understanding
3110	Knowledge and Understanding of General Facts and Terminology
3120	Knowledge and Understanding of General Processes
3130	Knowledge and Understanding of General Theory
3140	Other General Knowledge and Understanding
3200	Specialized Knowledge and Understanding
3210	Knowledge and Understanding of Specialized Facts and Terminology
3220	Knowledge and Understanding of Specialized Processes
3230	Knowledge and Understanding of Specialized Theory
3240	Other Specialized Knowledge and Understanding
3300	Research and Scholarship
3310	Research and Scholarship Knowledge and Understanding
3320	Research and Scholarship Products
3400	Art Forms and Works
3410	Architecture
3420	Dance
3430	Debate and Oratory
3440	Drama
3450	Literature and Writing
3460	Music
3470	Painting, Drawing, and Photography
3480	Sculpture
3490	Other Fine Arts
3500	Other Knowledge, Technology, and Art Form Outcomes
4000	*RESOURCE AND SERVICE PROVISION OUTCOMES*
4100	Provision of Facilities and Events
4110	Provision of Facilities
4120	Provision or Sponsorship of Events
4200	Provision of Direct Services
4210	Teaching
4220	Advisory and Analytic Assistance
4230	Treatment, Care, and Referral Services
4240	Provision of Other Services
4300	Other Resource and Service Provision Outcomes
5000	*OTHER MAINTENANCE AND CHANGE OUTCOMES*
5100	Aesthetic-Cultural Activities, Traditions, and Conditions
5200	Organizational Format, Activity, and Operation
5300	Other Maintenance and Change

[a] The fourth level categories, into which any of the categories listed here can be divided, are "maintenance" (a fourth digit of "1") and "change" (a fourth digit of "2").

SUBCATEGORIES OF THE "AUDIENCE" DIMENSION

10 *Individual/Group Clients*—This category refers to persons or groups of persons who are direct clients of the postsecondary education unit of concern and/or their immediate associates, such as family and relatives or peers.

11 *Students*—Individuals or groups of individuals who currently are enrolled in the program, institution, or system of postsecondary education

12 *Former Students*—Individuals or groups of individuals who formerly were enrolled in the program, institution, or system of postsecondary education

13 *Family and Relatives of Students or Former Students*

14 *Peers and Associates of Students or Former Students*

15. *Faculty*

16 *Staff Other than Faculty*

17 *Other Individual/Group Clients*—An example would be an individual who is none of the above but is served by an advisory service offered by the college.

20 *Interest-Based Communities*—This category refers to large groups that are identified as entities working toward a *well-defined interest* or *mission*

21 *Private Enterprise Communities*—Communities where a major purpose is financial remuneration and profit—for example, corporations, small businesses, and farmers

22 *Association Communities*—Communities where members belong on the basis of affiliation rather than employment, such as unions and professional societies.

23. *Government Communities*—Communities designed to administer government regulations and services, such as city hall, state department of education, and legislative communities

24 *Nongovernmental/Public Service Communities Other than the Institution Producing the Outcome*—Nonprofit service organizations, such as schools, hospitals, welfare agencies, philanthropic foundations, colleges (other than the college producing the outcome), and research organizations

25 *Institution or Institutional Unit Producing the Outcome*—The postsecondary education institution and/or units within that institution that are perceived as the producer/facilitator of the outcome(s) of concern.

26 *Other Interest-Based Communities*—An example would be an ad hoc coalition task force of representatives from two or more of the above areas.

30 *Geographic-Based Communities*—This category refers to large groups defined on the basis of *functional territorial boundaries*

31 *Local Community*—A township, city, county, metropolitan area, or other type of locality having particular boundaries. It is not necessarily restricted to the legal or jurisdictional boundary, but the functional one in which the impact of the institution is (or should be) directly and physically felt. The boundaries will vary with the institution/program and outcome of concern

32 *The State*

33 *A Region*—An aggregation of states or parts of states

34 *The Nation*

35 *An International Community*

36 *Other Geographic-Based Communities*—An example would be a research discovery that affects primarily people living in the coldest latitudes, or where it snows heavily

40 *Aggregates of People*—This category refers to subpopulations of people *distinguished by particular characteristics that may indicate common concerns, needs, or wants*, but who do not necessarily have a common interest or mission, and therefore do not constitute communities

41 *Ability Level Subpopulations*—Subpopulations defined according to level of ability/proficiency on general intellectual functioning or specific skills—for example, gifted, typical, disadvantaged, or skilled, semi-skilled, unskilled

42 *Age Subpopulations*

43 *Educational Level Subpopulations*

44 *Income Level Subpopulations*

45 *Occupation Subpopulations*

46 *Physical Disability Condition Subpopulations*

47 *Race Subpopulations*

48 *Sex Subpopulations*

49 *Other Such Aggregates*

50 *Other Audiences*—Examples would be the natural environment that is affected by university-sponsored research (which in turn would be expected to have impacts on audiences such as individuals and communities) and populations of animals (such as the animals affected by efforts to keep depleted species from becoming extinct or by the development of veterinary medicines)

APPENDIX B

Lists of Areas of Study and Occupational Titles[a]

LIST A: MAJORS AND AREAS OF STUDY

Programs usually requiring four or more years of study

- 0100 Agriculture and Natural Resources
- 0200 Architecture and Environmental Design
- 0300 Area Studies (includes Asian Studies, Black Studies, etc.)
- 0400 Biological and Life Sciences
- 0500 Business and Management
- 0600 Communications
- 0700 Computer and Information Sciences
- 0800 Education
- 0900 Engineering
- 1000 Fine and Applied Arts (includes Art, Dance, Drama, Music, etc.)
- 1100 Foreign Languages
- 1200 Health Professions
- 1300 Home Economics (includes Clothing and Textiles, Institutional Housekeeping, and Food Service Management, etc.)
- 1400 Law
- 1500 Letters (includes Creative Writing, Literature, Philosophy, Speech, etc.)
- 1600 Library Science
- 1700 Mathematics
- 1800 Military Sciences
- 1900 Physical Sciences (includes Chemistry, Physics, Earth Sciences, etc.)
- 2000 Psychology
- 2100 Public Affairs and Social Services
- 2200 Social Sciences (includes Anthropology, Economics, History, Political Science, Sociology, etc.)
- 2300 Theology and Religion
- 4900 Interdisciplinary Studies
- 6000 Other
- 7000 Undecided but probably program of four or more years

Programs usually requiring less than four years of study

- 5000 Business and Commerce Technologies (includes Accounting, Banking, Commercial Art, Hotel and Restaurant Management, etc.)
- 5005 Secretarial Technologies (includes Office Supervising and Management, Stenographic and Typing Technology, etc.)
- 5006 Personal Service Technologies (includes Stewardess Training, Cosmetologist, etc.)
- 5100 Data Processing Technologies (includes Computer Programming, Keypunching, etc.)
- 5200 Health Services and Paramedical Technologies (includes Dental and Medical Assistant Technology, LPN, Occupational and Physical Therapy Technology, etc.)
- 5300 Mechanical and Engineering Technologies (includes Aeronautical and Automotive Technology, Welding, Electronics, Architectural Drafting, etc.)
- 5317 Construction and Building Technologies (includes Carpentry, Plumbing, Sheet Metal, Heating, etc.)
- 5400 Natural Science Technologies (includes Agriculture Technology, Environmental Health Technology, Forestry and Wildlife Technology, etc.)
- 5404 Food Services Technologies (includes Food Service Supervising, Institutional Food Preparation, etc.)
- 5500 Public Service Technologies (includes Law Enforcement Technology, Teacher Aide Training, Fire Control Technology, Public Administration Technology, etc.)
- 5506 Recreation and Social Work Related Technologies
- 8000 Other
- Undecided but probably less than four year program

LIST B: OCCUPATIONAL TITLES

- 01 Agricultural and Forestry Occupations, Fishers, and Hunters
- 02 Clerical Occupations
- 03 Construction, Drilling, and Mining Occupations
- 04 Engineers and Architects
- 05 Executive, Administrative, and Managerial Occupations
- 06 Health-Diagnosing and Treating Practitioners
- 07 Health Technologists and Technicians
- 08 Marketing and Sales Occupations
- 09 Material Handlers, Equipment Cleaners, and Laborers
- 10 Mechanics and Repairers
- 11 Military Occupations
- 12 Natural Scientists and Mathematicians
- 13 Nurses, Pharmacists, Dietitians, Therapists, and Physicians' Assistants
- 14 Production Occupations (Occupations concerned with setting up, operating, or tending of machines and with hand production, usually in a factory / shop)
- 15 Service Occupations
- 16 Social Scientists, Social Workers, Religious Workers, and Lawyers
- 17 Teachers, Librarians, and Counselors
- 18 Technologists and Technicians (except Health)
- 19 Transportation and Material-Moving Occupations
- 20 Writers, Artists, Editors, and Athletes
- 21 Other

[a]These lists were developed for use in the questionnaires of the Student Outcomes Information Services (SOIS) Program sponsored jointly by NCHEMS and the College Entrance Examination Program (Gray and Others 1979).

APPENDIX C

HEGIS Taxonomy

APPENDIX C

THE HEGIS TAXONOMY*

In view of the length and comprehensive nature of the Taxonomy of Instructional Programs, it may sometimes be diffucult to locate the appropriate reporting title for a specific instructional program. To facilitate the location process, a summary list of the program categories (discipline categories) is shown below.

PROGRAM (DISCIPLINE) CATEGORIES

(Conventional academic subdivisions of knowledge and training)

Code

0000 GENERAL
0100 AGRICULTURE and NATURAL RESOURCES
0200 ARCHITECTURE and ENVIRONMENTAL DESIGN
0300 AREA STUDIES
0400 BIOLOGICAL SCIENCES
0500 BUSINESS and MANAGEMENT
0600 COMMUNICATIONS
0700 COMPUTER and INFORMATION SCIENCES
0800 EDUCATION
0900 ENGINEERING
1000 FINE and APPLIED ARTS
1100 FOREIGN LANGUAGES
1200 HEALTH PROFESSIONS
1300 HOME ECONOMICS
1400 LAW
1500 LETTERS
1600 LIBRARY SCIENCE
1700 MATHEMATICS
1800 MILITARY SCIENCES
1900 PHYSICAL SCIENCES
2000 PSYCHOLOGY
2100 PUBLIC AFFAIRS and SERVICES
2200 SOCIAL SCIENCES
2300 THEOLOGY
4900 INTERDISCIPLINARY STUDIES

(Technological and occupational specialties related to curriculums leading to associate degrees and other awards below the baccalaureate)

Code

5000 BUSINESS and COMMERCE TECHNOLOGIES
5100 DATA PROCESSING TECHNOLOGIES
5200 HEALTH SERVICES and PARAMEDICAL TECHNOLOGIES
5300 MECHANICAL and ENGINEERING TECHNOLOGIES
5400 NATURAL SCIENCE TECHNOLOGIES
5500 PUBLIC SERVICE RELATED TECHNOLOGIES

*Source: Robert A. Huff and Marjorie O. Chandler, A Taxonomy of Instructional Programs in Higher Education (Washington, D.C.: National Center for Educational Statistics, Office of Education, 1970).

PROGRAM (DISCIPLINE) SUBCATEGORIES

A listing of all probram (discipline) subcategories is given below by discipline categories. This section is included for purposes of definition to indicate which specific program subcategories are included in each program category.

0000 GENERAL USE

0100 AGRICULTURE AND NATURAL RESOURCES
- 0101 Agriculture, General
- 0102 Agronomy (Field Crops, and Crop Management)
- 0103 Soils Science (Management and Conservation)
- 0104 Animal Science (Husbandry)
- 0105 Dairy Science (Husbandry)
- 0106 Poultry Science
- 0107 Fish, Game, and Wildlife Management
- 0108 Horticulture (Fruit and Vegetable Production)
- 0109 Ornamental Horticulture (Floriculture, Nursery Science)
- 0110 Agricultural and Farm Management
- 0111 Agricultural Economics
- 0112 Agricultural Business
- 0113 Food Science and Technology
- 01 Forestry
- 01 Natural Resources Management
- 0116 Agriculture and Forestry Technologies
- 0117 Range Management
- 0199 Other, Specify

0200 ARCHITECTURE AND ENVIRONMENTAL DESIGN
- 0201 Environmental Design, General
- 0202 Architecture
- 0203 Interior Design
- 0204 Landscape Architecture
- 0205 Urban Architecture
- 0206 City, Community, and Regional Planning
- 0299 Other, Specify

0300 AREA STUDIES
- 0301 Asian Studies, General
- 0302 East Asian Studies
- 0303 South Asian (India, etc.) Studies
- 0304 Southeast Asian Studies
- 0305 African Studies
- 0306 Islamic Studies
- 0307 Russian and Slavic Studies
- 0308 Latin American Studies
- 0309 Middle Eastern Studies
- 0310 European Studies, General
- 0311 Eastern European Studies
- 0312 West European Studies
- 0313 American Studies
- 0314 Pacific Area Studies
- 0399 Other, Specify

0400 BIOLOGICAL SCIENCES
- 0401 Biology, General
- 0402 Botany, General
- 0403 Bacteriology
- 0404 Plant Pathology
- 0405 Plant Pharmacology
- 0406 Plant Physiology
- 0407 Zoology, General
- 0408 Pathology, Human and Animal
- 0409 Pharmacology, Human and Animal
- 0410 Physiology, Human and Animal
- 0411 Microbiology
- 0412 Anatomy
- 041 Histology
- 0414 Biochemistry
- 0415 Biophysics
- 0416 Molecular Biology
- 0417 Cell Biology (Cytology, Cell Physiology)
- 0418 Marine Biology
- 0419 Biometrics and Biostatistics
- 0420 Ecology
- 0421 Entomology
- 0422 Genetics
- 0423 Radiobiology
- 0424 Nutrition, Scientific (exclude Nutrition in Home Economics and Dietetics)

0425 Neurosciences
0426 Toxicology
0427 Embryology
0499 Other, Specify

0500 BUSINESS AND MANAGEMENT
0501 Business and Commerce, General
0502 Accounting
0503 Business Statistics
0504 Banking and Finance
0505 Investments and Securities
0506 Business Management and Administration
0507 Operations Research
0508 Hotel and Restaurant Management
0509 Marketing and Purchasing
0510 Transportation and Public Utilities
0511 Real Estate
0512 Insurance
0513 International Business
0514 Secretarial Studies
0515 Personnel Management
0516 Labor and Industrial Relations
0517 Business Economics
0599 Other, Specify

0600 COMMUNICATIONS
0601 Communications, General
0602 Journalism (Printed Media)
0603 Radio/TV
0604 Advertising
0605 Communication Media (use of videotape, film, etc., oriented specifically toward radio/TV)
0699 Other, Specify

0700 COMPUTER AND INFORMATION SCIENCES
0701 Computer and Information Sciences, General
0702 Information Sciences and Systems
0703 Data Processing
0704 Computer Programming
0705 Systems Analysis
0799 Other, Specify

0800 EDUCATION
0801 Education, general
0802 Elementary education, general
0803 Secondary education, general
0804 Junior high school education
0805 Higher education, general
0806 Junior and community college education
0807 Adult and continuing education
0808 Special education, general
0809 Administration of special education
0810 Education of the mentally retarded
0811 Education of the gifted
0812 Education of the deaf
0813 Education of the culturally disadvantaged
0814 Education of the visually handicapped
0815 Speech correction
0816 Education of the emotionally disturbed
0817 Remedial education
0818 Special learning disabilities
0819 Education of the physically handicapped
0820 Education of the multiple handicapped
0821 Social foundations (history and philosophy of education)
0822 Educational psychology (include learning theory)
0823 Pre-elementary education (kindergarten)
0824 Educational statistics and research
0825 Educational testing, evaluation, and measurement
0826 Student personnel (counseling and guidance)
0827 Educational administration
0828 Educational supervision
0829 Curriculum and instruction
0830 Reading education (methodology and theory)
0831 Art education (methodology and theory)
0832 Music education (methodology and theory)
0833 Mathematics education (methodology and theory)
0834 Science education (methodology and theory)
0835 Physical education
0836 Driver and safety education
0837 Health education (include family life education)
0838 Business, commerce, and distributive education
0839 Industrial arts, vocational, and technical education
0899 Other, specify

0900 ENGINEERING
0901 Engineering, General
0902 Aerospace, Aeronautical, and Astronautical Engineering
0903 Agricultural Engineering
0904 Architectural Engineering
0905 Bioengineering and Biomedical Engineering
0906 Chemical Engineering (include Petroleum Refining)
0907 Petroleum Engineering (exclude Petroleum Refining)
0908 Civil, Construction, and Transportation Engineering
0909 Electrical, Electronics, and Communications Engineering
0910 Mechanical Engineering
0911 Geological Engineering
0912 Geophysical Engineering
0913 Industrial and Management Engineering
0914 Metallurgical Engineering
0915 Materials Engineering
0916 Ceramic Engineering
0917 Textile Engineering
0918 Mining and Mineral Engineering
0919 Engineering Physics
0920 Nuclear Engineering
0921 Engineering Mechanics
0922 Environmental and Sanitary Engineering
0923 Naval Architecture and Marine Engineering
0924 Ocean Engineering

0925 Engineering Technologies
0999 Other, Specify

1000 FINE AND APPLIED ARTS
1001 Fine Arts, General
1002 Art (Painting, Drawing, Sculpture)
1003 Art History and Appreciation
1004 Music (Performing, Composition, Theory)
1005 Music (Liberal Arts Program)
1006 Music History and Appreciation (Musicology)
1007 Dramatic Arts
1008 Dance
1009 Applied Design (Ceramics, Weaving, Textile Design, Fashion Design, Jewelry, Metalsmithing, Interior Decoration, Commercial Art)
1010 Cinematography
1011 Photography
1099 Other, Specify

1100 FOREIGN LANGUAGES
1101 Foreign Languages, General
1102 French
1103 German
1104 Italian
1105 Spanish
1106 Russian
1107 Chinese
1108 Japanese
1109 Latin
1110 Greek, classical
1111 Hebrew
1112 Arabic
1113 Indian (Asiatic)
1114 Scandinavian Languages
1115 Slavic Languages (other than Russian)
1116 African Languages (non-Semitic)
1199 Other, Specify

1200 HEALTH PROFESSIONS
1201 Health Professions, General
1202 Hospital and Health Care Administration
1203 Nursing
1204 Dentistry
1205 Dental Specialties
1206 Medicine
1207 Medical Specialties
1208 Occupational Therapy
1209 Optometry
1210 Osteopathic Medicine
1211 Pharmacy
1212 Physical Therapy
1213 Dental Hygiene
1214 Public Health
1215 Medical Record Librarianship
1216 Podiatry or Podiatric Medicine
1217 Biomedical Communication
1218 Veterinary Medicine
1219 Veterinary Medicine Specialties
1220 Speech Pathology and Audiology
1221 Chiropractic
1222 Clinical Social Work
1223 Medical Laboratory Technologies
1224 Dental Technologies
1225 Radiologic Technologies
1299 Other, Specify

1300 HOME ECONOMICS
1301 Home Economics, General
1302 Home Decoration and Home Equipment
1303 Clothing and Textiles
1304 Consumer Economics and Home Management
1305 Family Relations and Child Development
1306 Foods and Nutrition (include Dietetics)
1307 Institutional Management and Cafeteria Management
1399 Other, Specify

1400 LAW
1401 Law, General
1499 Other, Specify

1500 LETTERS
1501 English, General
1502 Literature, English
1503 Comparative Literature
1504 Classics
1505 Linguistics (include Phonetics, Semantics, and Philology)
1506 Speech, Debate, and Forensic Science (Rhetoric and Public Address)
1507 Creative Writing
1508 Teaching of English as a Foreign Language
1509 Philosophy
1510 Religious Studies (exclude Theological Professions)
1599 Other, Specify

1600 LIBRARY SCIENCE
1601 Library Science, General
1699 Other, Specify

1700 MATHEMATICS
1701 Mathematics, General
1702 Statistics, Mathematical and Theoretical
1703 Applied Mathematics
1799 Other, Specify

1800 MILITARY SCIENCES
1801 Military Science (Army)
1802 Naval Science (Navy, Marines)
1803 Aerospace Science (Air Force)
1899 Other, Specify

1900 PHYSICAL SCIENCES
1901 Physical Sciences, General
1902 Physics, General (exclude Biophysics)
1903 Molecular Physics
1904 Nuclear Physics
1905 Chemistry, General (exclude Biochemistry)
1906 Inorganic Chemistry
1907 Organic Chemistry
1908 Physical Chemistry
1909 Analytical Chemistry
1910 Pharmaceutical Chemistry
1911 Astronomy
1912 Astrophysics
1913 Atmospheric Sciences and Meteorology
1914 Geology
1915 Geochemistry
1916 Geophysics and Seismology
1917 Earth Sciences, General
1918 Paleontology
1919 Oceanography
1920 Metallurgy
1999 Other, Specify

2000 PSYCHOLOGY
- 2001 Psychology, General
- 2002 Experimental Psychology (animal and human)
- 2003 Clinical Psychology
- 2004 Psychology for Counseling
- 2005 Social Psychology
- 2006 Psychometrics
- 2007 Statistics in Psychology
- 2008 Industrial Psychology
- 2009 Developmental Psychology
- 2010 Physiological Psychology
- 2099 Other, Specify

2100 PUBLIC AFFAIRS AND SERVICES
- 2101 Community Services, General
- 2102 Public Administration
- 2103 Parks and Recreation Management
- 2104 Social Work and Helping Services (other than Clinical Social Work)
- 2105 Law Enforcement and Corrections
- 2106 International Public Service (other than Diplomatic Service)
- 2199 Other, Specify

2200 SOCIAL SCIENCES
- 2201 Social Sciences, General
- 2202 Anthropology
- 2203 Archeology
- 2204 Economics
- 2205 History
- 2206 Geography
- 2207 Political Science and Government
- 2208 Sociology
- 2209 Criminology
- 2210 International Relations
- 2211 Afro-American (Black Culture) Studies
- 2212 American Indian Cultural Studies
- 2213 Mexican-American Cultural Studies
- 2214 Urban Studies
- 2215 Demography
- 2299 Other, Specify

2300 THEOLOGY
- 2301 Theological Professions, General
- 2302 Religious Music
- 2303 Biblical Languages
- 2304 Religious Education
- 2399 Other, Specify

4900 INTERDISCIPLINARY STUDIES
- 4901 General Liberal Arts and Sciences
- 4902 Biological and Physical Sciences
- 4903 Humanities and Social Sciences
- 4904 Engineering and Other Disciplines
- 4999 Other, Specify

5000 BUSINESS AND COMMERCE TECHNOLOGIES
- 5001 Business and Commerce Technologies, General
- 5002 Accounting Technologies
- 5003 Banking and Finance Technologies
- 5004 Marketing, Distribution, Purchasing, Business, and Industrial Management Technologies
- 5005 Secretarial Technologies (include Office Machines Training)
- 5006 Personal Service Technologies (Stewardess, Cosmetologist, etc.)
- 5007 Photography Technologies
- 5008 Communications and Broadcasting Technologies (Radio/TV, Newspapers)
- 5009 Printing and Lithography Technologies
- 5010 Hotel and Restaurant Management Technologies
- 5011 Transportation and Public Utility Technologies
- 5012 Applied Arts, Graphic Arts, and Fine Arts Technologies (include advertising design)
- 5099 Other, Specify

5100 DATA PROCESSING TECHNOLOGIES
- 5101 Data Processing Technologies, General
- 5102 Key Punch Operator and Other Input Preparation Technologies
- 5103 Computer Programmer Technologies
- 5104 Computer Operator and Peripheral Equipment Operation Technologies
- 5105 Data Processing Equipment Maintenance Technologies
- 5199 Other, Specify

5200 HEALTH SERVICES AND PARAMEDICAL TECHNOLOGIES
- 5201 Health Services Assistant Technologies, General
- 5202 Dental Assistant Technologies
- 5203 Dental Hygiene Technologies
- 5204 Dental Laboratory Technologies
- 5205 Medical or Biological Laboratory Assistant Technologies
- 5206 Animal Laboratory Assistant Technologies
- 5207 Radiologic Technologies (X-Ray, etc.)
- 5208 Nursing, R.N. (less than 4-year program)
- 5209 Nursing, Practical (L.P.N. or L.V.N.—less than 4-year program)
- 5210 Occupational Therapy Technologies
- 5211 Surgical Technologies
- 5212 Optical Technologies (include Ocular Care, Ophthalmic, Optometric Technologies)
- 5213 Medical Record Technologies
- 5214 Medical Assistant and Medical Office Assistant Technologies
- 5215 Inhalation Therapy Technologies
- 5216 Psychiatric Technologies (include Mental Health Aide Programs)
- 5217 Electro Diagnostic Technologies (include E.K.G., E.E.G., etc.)
- 5218 Institutional Management Technologies (Rest Home, etc.)
- 5219 Physical Therapy Technologies
- 5299 Other, Specify

5300 MECHANICAL AND ENGINEERING TECHNOLOGIES
- 5301 Mechanical and Engineering Technologies, General
- 5302 Aeronautical and Aviation Technologies
- 5303 Engineering Graphics (Tool and Machine Drafting and Design)
- 5304 Architectural Drafting Technologies
- 5305 Chemical Technologies (include Plastics)
- 5306 Automotive Technologies
- 5307 Diesel Technologies
- 5308 Welding Technologies

5309 Civil Technologies (Surveying, Photogrammetry, etc.)
5310 Electronics and Machine Technologies (TV, Appliance, Office Machine Repair, etc.)
5311 Electromechanical Technologies
5312 Industrial Technologies
5313 Textile Technologies
5314 Instrumentation Technologies
5315 Mechanical Technologies
5316 Nuclear Technologies
5317 Construction and Building Technologies (Carpentry, Electrical Work, Plumbing, Sheet Metal, Air Conditioning, Heating, etc.)
5399 Other, Specify

5400 NATURAL SCIENCE TECHNOLOGIES
5401 Natural Science Technologies, General
5402 Agriculture Technologies (include Horticulture)
5403 Forestry and Wildlife Technologies (include Fisheries)
5404 Food Services Technologies
5405 Home Economics Technologies
5406 Marine and Oceanographic Technologies
5407 Laboratory Technologies, General
5408 Sanitation and Public Health Inspection Technologies (Environmental Health Technologies)
5499 Other, Specify

5500 PUBLIC SERVICE RELATED TECHNOLOGIES
5501 Public Service Technologies, General
5502 Bible Study or Religion-Related Occupations
5503 Education Technologies (Teacher Aide and 2-year Teacher Training Programs)
5504 Library Assistant Technologies
5505 Police, Law Enforcement, Corrections Technologies
5506 Recreation and Social Work Related Technologies
5507 Fire Control Technology
5508 Public Administration and Management Technologies
5599 Other, Specify

ALPHABETICAL LISTING

For the user's convenience, the HEGIS discipline subcategories are listed below in alphabetical order.

Part 1:

CONVENTIONAL ACADEMIC SUBDIVISIONS OF KNOWLEDGE AND TRAINING

Title	*Code*
Accounting	0502
Administration, business	0506
Administration, educational	0827
Administration, public	2102
Administration, special education	0809
Adult education	0807
Advertising	0604
Aeronautical engineering	0902
Aerospace engineering	0902
Aerospace science	1803
African languages (non-Semitic)	1116
African studies	0305
Afro-American studies	2211
Agricultural business	0112
Agricultural economics	0111
Agricultural engineering	0903
Agricultural management	0110
Agriculture, general	0101
Agriculture technologies	0116
Agronomy	0102
American Indian cultural studies	2212
American studies	0313
Analytical chemistry	1909
Anatomy	0412
Animal science	0104
Anthropology	2202
Applied design	1009
Applied mathematics	1703
Arabic	1112
Archeology	2203
Architectural engineering	0904
Architecture	0202
Architecture, naval	0923
Art	1002
Art appreciation	1003
Art, commercial	1009
Art education	0831
Art history	1003
Asian studies, general	0301
Astronautical engineering	0902
Astronomy	1911
Astrophysics	1912
Atmospheric sciences	1913
Audiology	1220
Bacteriology	0403
Banking	0504
Biblical languages	2303
Biochemistry	0414
Bioengineering	0905
Biological and physical sciences (interdisciplinary)	4902
Biology, cellular	0417
Biology, general	0401
Biology, marine	0418
Biology, molecular	0416
Biomedical communication	1217
Biomedical engineering	0905
Biometrics	0419
Biophysics	0415
Biostatistics	0419
Black culture studies	2211
Botany, general	0402
Business administration	0506
Business, agricultural	0112
Business economics	0517
Business education	0838
Business, general	0501
Business, international	0513
Business management	0506
Business statistics	0503
Cafeteria management	1307
Catalan	1199
Cell biology	0417
Cell physiology	0417
Ceramic engineering	0916
Ceramics	1009
Chemical engineering	0906
Chemistry, general	1905
Child development	1305
Chinese	1107
Chiropractic	1221
Cinematography	1010
City planning	0206
Civil engineering	0908
Classics	1504
Clinical psychology	2003
Clinical social work	1222
Clothing	1303
Commerce education	0838
Commerce, general	0501
Commercial art	1009
Communication media	0605
Communications, general	0601
Communications engineering	0909
Community college education	0806
Community planning	0206
Community services, general	2101
Comparative literature	1503
Computer programming	0704
Computer sciences, general	0701
Construction engineering	0908
Consumer economics	1304
Continuing education	0807
Corrections	2105
Counseling, educational	0826
Counseling, psychology for	2004
Creative writing	1507
Criminology	2209
Crop management	0102
Curriculum	0829
Cytology	0417
Dairy sciences	0105
Dance	1008
Danish	1114
Data processing	0703
Debate	1506

Demography 2215
Dental hygiene 1213
Dental specialties 1205
Dental technologies 1224
Dentistry, D.D.S. or D.M.D. degree 1204
Developmental psychology 2009
Dietetics 1306
Distributive education 0838
Dramatic arts 1007
Drawing 1002
Driver education 0836

Earth sciences, general 1917
East Asian studies 0302
Eastern European studies 0311
Ecology 0420
Economics 2204
Economics, agricultural 0111
Economics, business 0517
Education of the culturally disadvantaged 0813
Education of the deaf 0812
Education of the emotionally disturbed 0816
Education, general 0801
Education of the gifted 0811
Education of mentally retarded 0810
Education of the multiple handicapped 0820
Education of the physically handicapped 0819
Education, religious 2304
Education of the visually handicapped 0814
Educational administration 0827
Educational evaluation 0825
Educational measurement 0825
Educational psychology 0822
Educational research 0824
Educational statistics 0824
Educational supervision 0828
Educational testing 0825
Electrical engineering 0909
Electronics engineering 0909
Elementary education, general 0802
Embryology 0427
Engineering, general 0901
Engineering mechanics 0921
Engineering and other disciplines (interdisciplinary) 4904
Engineering physics 0919
Engineering technologies 0925
English as a foreign language 1508
English, general 1501
English, literature 1502
Entomology 0421
Environmental design, general 0201
Environmental engineering 0922
European studies, general 0310
Experimental psychology (animal and human) 2002

Family life education 0837
Family relations 1305
Farm management 0110
Fashion design 1009
Field crops 0102
Finance 0504
Fine arts, general 1001
Finnish 1199
Fish management 0107
Floriculture 0109
Foods and nutrition 1306
Food science 0113
Food technology 0113
Foreign languages, general 1101
Forensic science 1506
Forestry 0114
Forestry technologies 0116
French 1102
Fruit production 0108

Game management 0107
General liberal arts and sciences (interdisciplinary) 4901
Genetics 0422
Geochemistry 1915
Geography 2206
Geological engineering 0911
Geology 1914
Geophysical engineering 0912
Geophysics 1916
German 1103
Government 2207
Greek, classical 1110
Guidance, education 0826

Health care administration 1202
Health education 0837
Health professions, general 1201
Hebrew 1111
Helping services 2104
Higher education, general 0805
Histology 0413
History 2205
History of education 0821
Home decoration 1302
Home economics, general 1301
Home equipment 1302
Home management 1304
Horticulture 0108
Hospital administration 1202
Hotel management 0508
Humanities and social sciences (interdisciplinary) 4903
Husbandry, animal 0104
Husbandry, dairy 0105

Ichthyology 0499
India studies 0303
Indian (Asiatic) 1113
Industrial arts education 0839
Industrial engineering 0913
Industrial psychology 2008
Industrial relations 0516
Information sciences 0702
Information sciences, general 0701
Information systems 0702
Inorganic chemistry 1906
Institutional management 1307
Instruction 0829
Insurance 0512
Interior decoration 1009
Interior design 0203
International business 0513
International public service 2106
International relations 2210
Investments 0505
Islamic studies 0306
Italian 1104

Japanese 1108
Jewelry 1009
Journalism 0602
Junior college education 0806
Junior high school education 0804

Kindergarten education 0823
Korean 1199

Labor relations 0515
Landscape architecture 0204
Latin 1109
Latin American studies 0308
Law enforcement 2105
Law, general 1401
Learning theory 0822
Liberal arts and sciences (interdisciplinary) 4901
Library science, general 1601
Limnology 0499
Linguistics 1505
Literature, comparative 1503
Literature, English 1502

Management, business 0506
Management, engineering 0913
Marine biology 0418
Marine engineering 0923
Marketing 0509
Materials engineering 0915
Mathematics, applied 1703
Mathematics, education 0833
Mathematics, general 1701
Mathematics, statistics 1702
Mechanical engineering 0910
Medical laboratory technologies 1223
Medical record librarianship 1215
Medical specialties 1207
Medicine, M.D. degree 1206
Metallurgical engineering 0914
Metallurgy 1920
Metalsmithing 1009
Meteorology 1913
Mexican-American cultural studies 2213
Microbiology 0411
Middle Eastern studies 0309
Military science 1801
Mineral engineering 0918
Mining engineering 0918
Molecular biology 0416
Molecular physics 1903
Music (liberal arts program) 1005
Music appreciation 1006
Music, composition 1004
Music education 0832
Music history 1006
Music, performing 1004
Music, theory 1004
Musicology 1006

Natural resources management 0115
Naval architecture 0923
Naval science 1802
Neurosciences 0425
Norwegian 1114
Nuclear engineering 0920
Nuclear physics 1904
Nursery science 0109
Nursing (baccalaureate and higher programs) 1203
Nutrition, scientific 0424

Occupational therapy 1208
Ocean engineering 0924
Oceanography 1919
Operations research 0507
Optometry 1209
Organic chemistry 1907
Ornamental horticulture 0109
Ornithology 0499
Osteopathic medicine, D.O. degree 1210

Pacific area studies 0314
Painting 1002
Paleontology 1918
Parasitology 0499
Park management 2103
Pathology, animal 0408
Pathology, human 0408
Pathology, plant 0404
Personnel management 0515
Petroleum engineering 0907
Petroleum refining 0906
Pharmaceutical chemistry 1910
Pharmacology, animal 0409
Pharmacology, human 0409
Pharmacology, plant 0405
Pharmacy 1211
Philology 1505
Philosophy 1509
Philosophy of education 0821
Phonetics 1505
Photography 1011
Physical chemistry 1908
Physical education 0835
Physical sciences, general 1901
Physical therapy 1212
Physics, general 1902
Physiological psychology 2010
Physiology, animal 0410
Physiology, human 0410
Physiology, plant 0406
Plant pathology 0404
Plant pharmacology 0405
Plant physiology 0406
Podiatry 1216
Political science 2207
Poultry science 0106
Pre-elementary education 0823
Programming, computer 0704
Psychology, clinical 2003
Psychology for counseling 2004
Psychology, developmental 2009
Psychology, education 0822
Psychology, general 2001
Psychology, industrial 2008
Psychology, physiological 2010
Psychology, social 2005
Psychometrics 2006
Public address 1506
Public administration 2102
Public health 1214
Public utilities 0510
Purchasing 0509

Radio	0603
Radiobiology	0423
Radiologic technologies	1225
Range management	0117
Reading education	0830
Real estate	0511
Recreation management	2103
Regional planning	0206
Rehabilitation services	1222
Religious education	2304
Religious music	2302
Religious studies	1510
Remedial education	0817
Restaurant management	0508
Rhetoric	1506
Russian	1106
Russian studies	0307
Safety education	0836
Sanitary engineering	0922
Sanskrit	1199
Scandinavian languages	1114
Science education	0834
Sculpture	1002
Secondary education, general	0803
Secretarial studies	0514
Securities	0505
Seismology	1916
Semantics	1505
Slavic languages (other than Russian)	1115
Slavic studies	0307
Social foundations of education	0821
Social sciences, general	2201
Social psychology	2005
Social work	2104
Sociology	2208
Soil conservation	0103
Soil management	0103
Soil science	0103
South Asian studies	0303
Southeast Asian studies	0304
Spanish	1105
Special education, general	0808
Special learning disabilities	0818
Speech	1506
Speech correction	0815
Speech pathology	1220
Statistics, mathematical and theoretical	1702
Statistics in psychology	2007
Student personnel	0826
Swedish	1114
Systems analysis	0705
Systems, information	0702
Teaching of English as a foreign language	1508
Technical education	0839
Television	0603
Textile design	1009
Textile engineering	0917
Textiles, home economics	1303
Theological professions, general	2301
Toxicology	0426
Transportation	0510
Transportation engineering	0908
Urban architecture	0205
Urban studies	2214
Vegetable production	0108
Veterinary medicine, D.V.M. degree	1218
Veterinary medicine specialties	1219
Vietnamese	1199
Vocational education	0839
Weaving	1009
West European studies	0312
Wildlife management	0107
Writing, creative	1507
Zoology, general	0407

Part II:

TECHNOLOGICAL AND OCCUPATIONAL CURRICULUMS LEADING TO ASSOCIATE DEGREES AND OTHER AWARDS BELOW THE BACCALAUREATE

Title	*Code*
Accounting technologies	5002
Advertising design technologies	5012
Advertising technologies	5004
Aeronautical technologies	5302
Agriculture technologies	5402
Air conditioning technologies	5317
Airport management technologies	5004
Animal laboratory assistant technologies	5206
Appliance repair technologies	5310
Applied arts technologies	5012
Architectural drafting technologies	5304
Automotive technologies	5306
Aviation technologies	5302
Banking technologies	5003
Bible study	5502
Biological laboratory assistant technologies	5205
Broadcasting technologies	5008
Building technologies	5317
Business management technologies	5004
Business technologies, general	5001
Carpentry technologies	5317
Chemical technologies	5305
Civil technologies	5309
Commerce technologies, general	5001
Communications technologies	5008
Computer operator technologies	5104
Computer, peripheral equipment operation technologies	5104
Computer programmer technologies	5103
Construction technologies	5317
Corrections technologies	5505
Cosmetologist	5006