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ABSTRACT
 Projects of the National Center for Higher Education Management Systems (NCHEMS) conducted to develop techniques and strategies for describing and analyzing outcomes are discussed. It is suggested that the information will assist decision-makers in understanding and using outcomes information in their planning and management decisions. The Center's orientation to the outcomes information problem and the development of their research design are explained. The objectives of each outcomes-related activity and the products developed through these activities are described. Major goals of the outcomes projects include: (1) identifying indicators of postsecondary education outcomes; (2) defining each indicator in a standard fashion; (3) developing procedures for acquiring data relative to each indicator; and (4) disseminating the information and products to decision-makers in the postsecondary community. Ten outcomes-related projects undertaken by NCHEMS are briefly summarized, with their potential applications and basic source documents listed. (SF)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

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NCHEMS OUTCOMES-RELATED ACTIVITIES AND PRODUCTS: AN OVERVIEW

Introduction

As its name implies, the National Center for Higher Education Management Systems (NCHEMS) is concerned with developing planning and management systems for institutions and agencies of postsecondary education. Over 650 institutions and agencies of postsecondary education currently support and participate in the NCHEMS program. Constituent involvement always has been a vital part of the underlying philosophy of the Center. From its earliest inception in 1965, when it was first suggested that interstate cooperation in the application of management science in postsecondary education should be investigated, those likely to be affected by the Center's work have been actively involved in the NCHEMS program. These institutions and agencies include all sectors of the postsecondary education community: postsecondary education associations, national professional organizations, regional compacts for education, state-wide coordinating and governing boards, community and junior colleges, multi-campus systems, and private and public colleges and universities from across the nation. It is estimated that the institutions participating in the NCHEMS program enroll over eight million students.

Although NCHEMS always has recognized that both outcome information and cost information are necessary for effective planning and management in postsecondary education, NCHEMS did not immediately attack both problems on the same scale.

The Center's initial efforts focused primarily on the development of procedures for measuring, analyzing, and communicating institutional and program costs. This strategy was not only a result of the size of the problem and the inherent resource limitations but also a response to the needs and preferences of NCHEMS' constituents.

However, as pressures for accountability increased and the postsecondary education community began feeling the financial pressures of rising costs and limited resources, NCHEMS recognized that it no longer could focus primarily on the development of cost information--the problem of developing outcome information had to be addressed also. As a result, a series of projects have been conducted to develop techniques and strategies for describing and analyzing educational outcomes and to assist decision makers in understanding and using outcome information in their planning and management decisions. This paper briefly describes the objectives of the Center's outcomes-related activities and discusses the products developed through these activities.

Long-Range Approach

At the beginning of the Center's work in the outcomes area, the major objective was to become more familiar with the outcomes measurement and analysis problem in higher education and determine how NCHEMS could aid its constituents in dealing with the problem. Pursuing this objective, the staff began studying what had been done in this area and examining the questions decision makers were asking relative to higher education outcomes. Many discussions were

held with practitioners, researchers, and others interested in the outcomes information problem. A national seminar was held in Washington D.C. in 1970 for the purpose of highlighting the problems of identifying, measuring, and analyzing the outcomes of higher education. A number of authorities in the field were brought together to present position papers on the subject and the results of the seminar were compiled and published (Lawrence, et al., 1970). Another major activity during this early stage was the establishment of a Design Committee for the purpose of conceptualizing and stimulating thinking about what research development, and implementation efforts should be undertaken.

As the project work progressed, this early objective gave rise to an overall conception of the outcomes area that could serve as an operational basis for future work. The outcomes-related work currently underway at NCHEMS rests on the premise that in order to collect and use information about the outcomes of postsecondary education, three related needs must be filled:

1. The need to provide a comprehensive picture of the outcomes of postsecondary education and to develop the capability to measure these outcomes.
2. The need to provide a structure for organizing outcomes information as a prerequisite for the analysis and communication of this information.
3. The need to develop analytic procedures to apply this information to the solution of particular planning and management problems.

Major components of the outcomes-related projects are directed toward each of these needs.

With regard to measures of educational outcomes, NCHEMS staff are working to: (1) identify indicators of postsecondary education outcomes, (2) define

each of these indicators in a standard fashion, (3) develop procedures for acquiring data relative to each of these indicators, and (4) disseminate the information and products to decision makers in the postsecondary education community.

Two major criteria continue to be considered in the development of the full range of postsecondary education outcome indicators. First, they should reflect a recognition that information needs vary considerably across different decision makers. Second, the measures should acknowledge that educational outcomes occur over an extended period of time.

In responding to the need for an organizing structure,⁰ the staff are working to: (1) develop a general categorization scheme for classifying and organizing outcome measures, (2) identify the distinctly different types of educational outcomes, (3) categorize measures in accordance with these distinctions, and (4) provide procedures whereby measures can be arrayed within these major categories in a logical and useful fashion. In developing the structure, attention is given to ensure that it not only accommodates the full range of outcomes but also makes allowances for the various outcome dimensions such as long-term vs. short-term and the multiple levels of detail--from individual to society--that must be accommodated.

In addition to organizing measures for ease of communication, this structure should provide a focal point for conceptual and theoretical discussions surrounding the question, "Just what are the outcomes of postsecondary education?" The development of a comprehensive outcomes structure requires the resolution of the very difficult question of what should be considered an outcome of postsecondary education and what should not. The structure will serve also to identify categories of outcomes for which measures or

indicators are not yet identified. Used in this way, a formal structure can not only provide a mechanism to assist in the coordination of research and development efforts but also serve as a device to highlight those outcomes for which quantitative measures are not available and thus reinforce the need to deal with such outcomes qualitatively.

Inasmuch as the ultimate objective is improved planning, management, and evaluation, NCHEMS is placing particular emphasis on the identification and development of relevant analytic capabilities that will foster the interpretation and use of outcome data. In particular, attention is being focused on developing capabilities for investigating relationships among input or process variables and resulting outcomes. It is anticipated that users will benefit not only from the actual findings of these analyses in case study form, but also from the dissemination of prototype analytic procedures and techniques applicable in undertaking analyses of particular kinds of problems. In carrying out these tasks, NCHEMS is relying heavily on a strategy of producing preliminary products early in the development cycle and then concentrating on making improvements wherever possible. This development approach is also characterized by the active involvement of the potential users of the project results at each major stage. NCHEMS has consistently favored a style of operation that solicits input from product users during the development process. Historically, this involvement has been obtained through task forces, advisory groups, field reviews and pilot tests. In the outcomes-related projects, these involvement mechanisms have been augmented by surveys and other devices that allow the staff to acquire user input in a more systematic and specific way.

NCHEMS Outcomes Products in Context

Out of the initial work of the NCHEMS Outcomes of Postsecondary Education Project came a document (Micek and Wallhaus, 1973) that presented a "Framework for Understanding the Use of Higher Education Outcome Information" and an "Inventory of Higher Education Outcome Variables and Measures." Nine additional major sets of outcomes products have since been developed or are currently under development. Each will be described here briefly, in chronological order of development. Their potential applications and basic source documents are listed in Figure 2 on pages 10-11 (in alphabetical order by name). Taken as an array, these sets of products also suggest the importance of not considering educational outcomes in isolation.

- Inventory of Higher Education Outcome Variables and Measures. This is a logically organized listing of outcome categories and subcategories with a definition and a list of potential measures and indicators for each. The overall broad categories are three in number: (1) Student Growth and Development, (2) Development of New Knowledge and Art Forms, and (3) Community Development and Service. In addition, formal procedures are provided for using the Inventory in translating goals into measurable terms and developing a priority list of outcomes.
- Inventory of Institutional Environment Variables and Measures. This is a list of institutional environment categories and subcategories with a set of suggested indicators or measures associated with each. It was constructed under the rationale that many people view the educational environment as an educational outcome and that outcomes must be described and understood in relation to the environment within which they occur. The five major categories in this inventory are (1) Instructional/Research Environment, (2) Physical Environment, (3) Organizational Environment, (4) Social Environment, and (5) Economic Environment.
- Outcome Measures Identification Study. One way to generate goals is to ask relevant higher education decisionmakers what outcome measures and indicators will be helpful to them in their day-to-day decisionmaking, and then inductively arriving at the goals that they imply. This study involved asking five groups to respond to a list of outcome measures in terms of (1) the extent to which they needed the measure for their decisionmaking, and (2) the access they had to data for the measure. The groups surveyed were institutional academic vice presidents, institutional student affairs vice presidents, institutional finance presidents, state-level higher education administrators, and state legislators. The questionnaire and procedures used have served as a model for a number of similar studies within institutions.

- Outcome Measures and Procedures Manual. This manual presents suggested standard definitions, data sources, and data acquisition procedures for over forty outcome measures found to have high priority in the Outcome Measures Identification Study discussed above. An expanded version of this manual is currently under development.
- Student Outcomes Questionnaires. Student outcomes probably have the highest priority at most colleges, and to really understand them requires a longitudinal measurement approach. Furthermore, a longitudinal approach encourages better planning for the assessment of student outcomes, results in increased ability to follow students, means less duplication and shorter questionnaires for students, increases the probability that the needed outcomes information will be collected at the proper time, and allows the questionnaire administration to be integrated into the systematic, ongoing process of the institution.

This product group, which has been developed jointly by NCHEMS and the College Board, includes a series of tried and tested basic student-outcomes questionnaires (entering student, current student, dropouts, graduating student, and recent alumni) for two-year colleges and four-year colleges and universities, a manual for using the questionnaires and the data collected, a questionnaire response-analysis service, and comparative data.

- Outcomes Structure. This is a framework and system for organizing the full range of postsecondary education outcomes and information about those outcomes for purposes of classification, analysis, and decision-making. Similar in concept to the outcomes inventory described previously, it is more comprehensive in its coverage, more neutral in its orientation, more flexible in its application, and it includes three dimensions of outcomes rather than one. The three dimensions are "audience" (who or what is intended to, or actually does, receive or be affected by the outcome), "type-of-outcome" (the basic entity on which the outcome is focused, and whether it involves maintenance or change), and "time" (when the outcome occurs or is expected to occur, and its actual or expected duration). Hierarchies of categories, along with standard definitions and illustrative measures and indicators for each category, are presented separately for the dimensions. Procedures for practical application of the structure to meet particular needs of institutional personnel are outlined.
- Institutional Goal Achievement: Measures of Progress. The widely used *Institutional Goals Inventory* of Educational Testing Service lists a number of specific goal statements for each of twenty goal areas, and asks respondents to rate the importance of the statements in terms of "should be" and "is." For each of these same 20 goal areas, this new NCHEMS instrument lists a number of potential measures of progress. Respondents are asked to rate the importance of each area as a goal, and how appropriate each measure is for measuring progress in achieving that goal, at their institution.
- Community Impact Assessment. Every postsecondary education institution has various kinds of impacts on the local community, and perhaps on other communities--for example, economic impacts, educational impacts, social/cultural impacts, recreational impacts, and technological impacts. Being able to demonstrate and document such impacts can have major consequences



for the economic and other types of support that an institution receives, and this is especially true for community-based institutions. Heretofore, most community impact studies have neglected the important impacts that are outside of the economic area. Furthermore, they have often not looked separately at the impacts on important community subgroups, and have tended to overlook the indirect impacts through faculty, staff, students, and graduates of the institution. This product includes practical procedures and guidelines for conducting, and using the results from, a comprehensive community impact study at two-year community colleges.

- Needs Assessment Framework. Before one develops institutional goals and plans for achieving those goals, it is essential to determine constituent needs and relate them to institutional mission. The same is true at the program level. Yet what usually happens is that constituent needs are assessed subjectively in an "off the top of the head" manner. Models are lacking for formal needs assessment in higher education, and the ones available lack important characteristics such as the following: (1) is systematic; (2) is comprehensive; (3) gathers input from many relevant groups; (4) derives and ranks both "what should be" and "what is;" (5) emphasizes understanding as well as identification; (6) distinguishes between needs, wants, and demands; (7) relates client needs to institutional considerations; and (8) considers information in interaction rather than isolation. This product includes a conceptual framework and general alternative procedures for conducting needs assessment studies in postsecondary education.
- Compendium of Research Related to Selected Outcome Measures. Separately for selected measures (and particularly those included in the *Outcome Measures and Procedures Manual*) in selected categories of the NCHEMS Outcomes Structure, this product provides a synthesis of the research literature that speaks to the validity, reliability and applicability of each measure. Annotations of selected research studies are also provided for each measure.

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Figure 2
NCHEMS OUTCOMES-RELATED PRODUCTS

PRODUCT SET	POTENTIAL APPLICATIONS	BASIC RESOURCE DOCUMENTS
COMMUNITY IMPACT ASSESSMENT	<ul style="list-style-type: none"> • Identification of constituent needs • Assessment of constituent needs • Identification of community impact measures and indicators • Collection of data on community impact • Communication about community impacts with constituents and publics 	<p>Conducting Community-Impact Studies: A Handbook for Community Colleges, 1978</p> <p>Assessing Community-College Impacts: Three Case Studies, 1979</p>
INSTITUTIONAL GOAL ACHIEVEMENT: MEASURES OF PROGRESS (IGA:MP)	<ul style="list-style-type: none"> • Translation of goals to measurable objectives • Identification of outcome measures and indicators • Outcomes data collection • Evaluation 	<p>Measures of Institutional Goal Achievement, 1978</p>
INVENTORY OF HIGHER EDUCATION OUTCOME VARIABLES AND MEASURES	<ul style="list-style-type: none"> • Stimulation of thinking about outcomes in a concrete and systematic manner • Determination of outcome goals and priorities • Translation of goals to measurable objectives • Identification of outcome measures and indicators • Assessing alternative courses of action in terms of outcomes • Evaluation • Communication about outcomes 	<p><u>An Introduction to the Identification and Uses of Higher Education Outcome Information</u>, Technical Report 40, 1973</p>
INVENTORY OF INSTITUTIONAL ENVIRONMENT VARIABLES AND MEASURES	<ul style="list-style-type: none"> • Stimulation of thinking about environment • Determination of process goals • Translation of goals to measurable objectives • Assessing alternative courses of action in terms of environment 	<p>"Inventory of Institutional Environment Variables and Measures" unpublished document, 1974</p>
NEEDS ASSESSMENT FRAMEWORK	<ul style="list-style-type: none"> • Identification of constituent needs • Assessment of constituent needs 	<p>A document that synthesizes the needs assessment literature is in preparation</p>

PRODUCT SET	POTENTIAL APPLICATIONS	BASIC RESOURCE DOCUMENTS
OUTCOME MEASURES IDENTIFICATION STUDY	<ul style="list-style-type: none"> • Identification of priority outcome measures and indicators • Stimulate thinking about outcome measures and indicators that are needed • Determination of outcome information accessibility 	<u>The Higher Education Outcome Measures Identification Study: A Descriptive Summary, 1: 4</u>
HIGHER EDUCATION OUTCOME MEASURES AND PROCEDURES	<ul style="list-style-type: none"> • Stimulation of thinking about outcomes in a concrete and systematic manner • Identification of outcome measures and indicators • Collection of outcomes data • Communication about outcomes 	<u>Outcome Measures and Procedures Manual, Technical Report 70, 1975</u> (This manual is currently being revised.)
OUTCOMES STRUCTURE	<ul style="list-style-type: none"> • Stimulation of thinking about outcomes in a concrete and systematic manner • Developing needs assessment studies • Developing needs assessment questionnaire items • Determination of outcome goals and priorities • Assessment of goals adequacy • Translation of goals to measurable objectives • Identification of outcome measures and indicators • Assessing alternative courses of action in terms of outcomes • Evaluation • Communication about outcomes • Outcomes research 	<u>A Structure for the Outcomes of Postsecondary Education, 1977</u> <u>An Overview of the Outcomes Structure, and Its Application in Postsecondary Education Institutions, 1977</u> <u>Previous Attempts to "Structure" Educational Outcomes and Outcome-Related Concepts: A Compilation and Review of the Literature, 1977</u>
STUDENT OUTCOME QUESTIONNAIRES AND RELATED SERVICES (Products and services jointly developed by NCHEMS and the College Board and disseminated through the NCHEMS-College Board Student Outcomes Information Services (SOIS))	<ul style="list-style-type: none"> • Stimulation of thinking about student outcomes and their assessment • Identification of student outcome measures and indicators • Collection of outcomes data • Evaluation • Communication about outcomes • Development of a longitudinal student data base • Response-analysis service • Comparative data 	<u>Student Outcomes Questionnaires: An Implementation Handbook, 1979</u> <u>Student Outcomes Questionnaires: Community College Series, 1979</u> <u>Student Outcomes Questionnaires: Four-Year College and University Series, 1979</u> <u>A Manual for Conducting Student Attrition Studies (Revised 1979)</u>

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PRODUCT SET	POTENTIAL APPLICATIONS	BASIC RESOURCE DOCUMENTS
COMPENDIUM OF RESEARCH RELATED TO SELECTED OUTCOME MEASURES	<ul style="list-style-type: none"> • Stimulation of thinking about outcomes assessment • Outcome measures and indicators development, modification, and/or evaluation • Identification of outcome measures and indicators • Outcomes research 	A data bank and summary document are in preparation