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Application of a social indicator model to determine community benefits derived from community colleges

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CHAPTER I. INTRODUCTION

The educational system like many other institutions in American society is being re-evaluated. Beginning with the past decade, a whole continuum of new methods for organization and delivery of educational services is being developed in order to cope with the large student bodies and the ever-growing mass of knowledge. Part of the impetus has also come from recent movements that emphasize the goal of realizing human potential. Thus, there have been dramatic increases in specialized learning activities of a vocational, technical, and professional nature. Rising educational expenditures for a wider variety of educational activities, the development and expansion of new types of educational services, and innovations in instructional methods and curriculae content at all levels including graduate schools have created a new awareness in American society of its educational system.

It is only recently that the American public has expressed a concern that the nation has been spending billions of dollars year after year on an enterprise without knowing how effective the expenditures are, or even if they are being directed toward stated goals. This fact has resulted in the demand that institutions of higher education become "accountable" to their various publics.

Cohen (44) reports on the inadequacies of current educational data. The weakness of quantitative data lay basically in their aggregated nature and disaggregation of data currently collected would provide significantly more meaningful information. Data of a qualitative

nature, indicators that reflect what students have learned are, he notes, essentially non-existent. Thus, although voluminous data on education exists, they are unsuitable for measuring in any significant way, the output of the system in terms that really matter. Although education is perceived by Americans as important for the nation's future, the expectation that there are many assessments of what or how much American children learn is not fullfilled (172).

Effective plans for achieving educational objectives and the execution of those plans depend on the availability of continuing, regularly collected data. Indicators that reflect the results of the educational process would provide insight into changes taking place in education and into existing and potential educational problems. They would also offer a means of evaluating progress toward defined goals.

At the broader societal level there has been a call from women, various minority groups, welfare recipients, war protestors, etc. for large-scale transformations in the structures of society. However, in many areas in which social critics pass judgments there are no yardsticks by which to know if things are getting better or worse (17).

Bell (22) notes that existing government data are organized primarily for administrative purposes and not for analysis. From such data it is difficult to draw conclusions which are of normative value. For example, statistics on health care tell the amount of money spent on health care and how many doctors, nurses and hospitals are available. But there are no measures of the results. Part of the difficulty, Bell says, is that our data collection is oriented to

"inputs" and not to evaluation. The larger difficulty is a conceptual one because there has been no agreement as to how to measure "health". The same analogy can be made to education and how one measures "learning".

Finally there is the problem of informing the general public on matters related to social performance. The opening statement of Toward a Social Report (172) states that "The Nation has no comprehensive set of statistics reflecting social progress or retrogression. There is no Government procedure for periodic stock-taking of the social health of the Nation. The Government makes no Social Report".

Recurring social problems have been the concern of social scientists, legislators, and governmental agencies for some time. Corrective social action, however, has usually been accomplished within the confines of a particular problem area without consideration of the effect changes in one social area have on other aspects of society. Even when such changes are noted by those working in the affected areas, communications are not exchanged. Recognition of the lack of information regarding the interplay among the forces within the different sectors of society has resulted in the development of the concepts of "social indicators", "social reports", "social accounting" and "monitoring social change". The idea subsumed in these concepts is the need to provide "indices" of the various aspects of social life and their interrelationships for the purpose of predicting and analyzing the impact of a change in one aspect of American life on all other structural features of society.

Social indicators are generally conceived of as measures of some aspect or condition of society or its elements, which is of interest to individuals officially charged with responsibilities for planning and evaluating programs. They may be an aggregate sum, an index, a ratio, or some other quantifiable construct. The concept of social indicators has inherently a normative reference. The information is given significance because it tells the policy and systems designer something about the current quality of life in the society.

Systems of social indicators provide methods for generating new categories of information about particular discrete social impacts and also provide basic measures of structure and process in society which can act as baselines against which to measure the potential utility, scope and quality of any program (175).

The public community college represents the educational delivery system for vast numbers of people who, without availability of the opportunities offered by these institutions, probably would never see the inside of a college classroom. Community colleges have been designed to meet both individual and national needs. They are conceived to be the stimulus and the tool for tapping new talent pools and to prepare the nation's population for new kinds of social and vocational responsibilities. The community college arose as an eclectic, opportunistic and socially oriented institution. It differs from a junior college in that it offers a more diverse educational program to a more diverse population. Rather than limiting its offerings to a two-year college parallel curriculum that prepares students for transfer into 4-year institutions (88), it aims for a comprehensiveness determined

by the educational needs of the community in which it is located (114).

Although over 1,000 community colleges have "sprung up" over the past decade, there is no substantial way of measuring the social benefits derived from the existence of this unique type of educational institution.

This research effort has been stimulated by these recent developments within higher education, within the academic area of sociology (specifically the social indicator movement), and by the special concern of researcher for the development of the community college system. The idea that the emphases of these three areas could be pulled together into one research effort is given support by the fact that despite the 50 year record of social science involvement in education, "important gaps still exist in the utilization of social science knowledge by educators" (133, p. 24). To fill these gaps the Special Commission on the Social Sciences of the National Science Foundation recommends that increased effort should be made to explore linkages between basic theory and research in the social sciences on the one hand, and educational policy and practices on the other. The parallel research efforts on the part of researchers within the social indicator movement and within education support the contention that the development of educational indicators might advance more rapidly by the establishment of communication channels and cooperative research efforts.

Purpose of the Study

Several writers within the social indicator movement as well as educational leaders have pointed to the need for this nation to develop a valid information system for its institutions in order to provide the data necessary for assessing and evaluating their outputs. One purpose of this study is to respond to these suggestions by presenting a conceptual model developed by this researcher as one alternative for assessing the benefits derived from community college programs. The second purpose of the study is to test selected relationships from the model in order to determine its feasibility as a tool for policy and decision-making at the local college level, at the educational system level, and at the national level.

During the course of this study, facts about the model as a feasible tool for policy and decision-making as well as facts about the individual institutions under study will emerge. Attempts will be made to determine if the data necessary for applying the model are currently being collected at the local level, if data that are not currently collected is available and/or easily accessible, if the relationships specified by the model do exist, and if the existence of these relationships is relevant to policy and decision-making at any of the three organizational levels indicated.

Objective of the Study

The objective of this study is to test the feasibility of applying a social indicator model to determine social benefits derived from

community college programs.

Hypotheses to be tested

Four major hypotheses based on four major premises are to be tested inferentially by testing a series of sub-hypotheses directly related to the major hypothesis under consideration. The major premises and hypotheses are presented here. The sub-hypotheses will be introduced in Chapter III.

Major Premise I If it can be shown that the model presented contains input variables that are directly related to specified output variables, it can be concluded that the model is a useful tool for use in policy and decision-making at the local college level.

Major Hypothesis 1 The model presented is a feasible tool for visualizing the existence of relationships between those resource variables going into specific program areas of a single community college (inputs) and the results coming out of that program area (outputs).

Major Premise II If it can be shown that the model contains the bases for comparison between total community college district populations and enrollment populations within each program area then the model is a useful tool for evaluation of the "reach" (extent and direction) of community college benefits at the local district level.

Major Hypothesis 2 The model is effective as a tool for evaluating the extent and direction in which community college goals are

being achieved at the community college district level.

Major Premise III If it can be shown that the model contains the basis for making comparisons between emphases placed on one or two program areas to the exclusion or detriment of other program areas, it can be concluded that the model is an effective tool for visualizing "institutional program emphasis" at the individual college level.

Major Hypothesis 3 The model is an effective tool for determining if institutional emphasis on a single program exists at the local college level.

Major Premise IV If it can be shown that the model contains variables, the comparison of which when made inter-institutionally, indicate commonality among institutions regarding the extent and direction of community college benefits then the model is a useful tool fo indicating the type of data aggregation that is meaningful at the national level and the kinds of institutional/national standard comparisons that are relevant for policy and decision-making at the local and national levels.

That is, if community colleges are effectively reaching all segments of their local district populations with each of their program areas, (see Major Hypothesis 2) their outputs will reflect their district populations in terms of age, sex, race, and socio-economic status. Since community college district populations vary in respect to these parameters, community colleges nationally should reflect heterogeneous outputs in respect to each other. The heterogeneity should emerge in this pilot study since the colleges under study are located in population areas that are quite different from each other. Thus, the age,

sex, race, and socio-economic status data of students enrolled and completing programs at each of the three institutions selected should be dissimilar from each other. If a similarity among the colleges does emerge, it can be concluded that community colleges systematically reach certain segments of the national population regardless of population parameters at the local level. Further, aggregation of data regarding these parameters at the national level is meaningful and comparison of individual institutions across the nation against a "national standard" for community colleges would be realistic.

If however, a dissimilarity among the data from the three institutions emerges, the colleges can be considered as contributing to national achievement in different ways. In this instance, aggregation of the outputs of all community colleges at the national level is not meaningful and comparisons of community colleges to a national production standard among all community colleges in the nation is misleading.

Major Hypothesis 4 The model presented is a useful tool for evaluating the extent and direction to which community college goals are being achieved at the national level.

Basic Assumptions

1. Sufficient commonality exists among community colleges to allow them to be considered as a system and examined as such. The common elements include: participation in the over-all state educational plan, admittance to all students "who can benefit", charging minimal tuition, comprehensive programs designed to meet the needs of

all community members of post-high school age, commitment to seeking out potential students, and local control.

2. Specific program offerings are sufficiently standardized to allow inter-institutional comparisons of input and output data. General programmatic areas include: a College Parallel program, a Career Development program, a Developmental program, an Adult Education program, and a Community Service program.

3. The "normative" strategy employed in this research effort will not adversely affect the internal validity of the study and may in fact, reinforce its external validity. Community colleges have been developed on the basis of a common set of values and goals that reflect a democratic "ideal". The idea is that the more these goals are attained, the "better off" the community will be. The goals are being perpetuated across the nation and questions regarding who established these goals, or who "should have" established them, are, for purposes of this study, irrelevant. The relevant issue here is whether or not the goals as established are being met - whether the effect of each program area, by itself or in concert with the effects of the other program areas, reaches and meets the needs of the community it is designed to serve.

4. Data based on an institutional self-study conducted for the purpose of achieving accreditation is assumed to be accurate if the college did become accredited on the basis of this data.

5. The output measures identified in the model constitute valid measures of social benefit derived by the community and the individual student.

Sources of Data

Data for this research effort was gathered from the official files of Marshalltown Community College, a rural college in central Iowa; from William Rainey Harper Community College, located in a Chicago suburb; and Cuyahoga Community College (Metro Campus), located in downtown Cleveland. All three of these institutions have been accredited by the North Central Association.

Limitations of the Study

The current investigation is regarded as a pilot project to determine the feasibility of applying a social indicator model to determine social benefits to the community by the presence of a community college in the community. Investigation will be limited to three community colleges, one rural, one urban, and one suburban. These colleges have been in existence long enough to have had at least two graduating classes from its College Parallel program and have received accreditation.

Three input variables and three output variables out of the total population of input-output variables presented in the model will be investigated for each of the two program areas of College Parallel and Career Development in each of the three colleges. The variables investigated at each of the institutions will include those presented in Table 1.

Table 1. Input and output variables to be investigated

	College Parallel Program	Career Development Program
Inputs	Students, full-time Enrollment/Community Ratio Faculty/Student Ratio	Students, full-time Enrollment/Community Ratio Faculty/Student Ratio
Outputs	Enrollment/Completion Ratio Transfer/Application Ratio Length of time at 4-year institution	Enrollment/Completion Ratio Type of initial job placement Current job status

The sample n of 40 students from each program area at each college (for a total of 80 students per college), is too small to draw definitive cause-effect relationships between the input-output variables but is sufficiently large to determine the feasibility of using the indicator model in diverse situations.

The pilot study has been conducted independent of budget factors. Diverse findings among the three institutions in variables such as student/faculty ratios may reflect budget oriented decisions which are not considered in this research effort.

Definitions

For purposes of this study, the following terms are operationally defined:

Adult Education - refers to regularly scheduled courses of study of one sememster or longer that allow the student to work toward a degree or attain vocational proficiency, as well as those regularly scheduled classes that provide opportunity to

learn at any time (78).

Aggregate - refers to the construction of a single composite statistic derived from a series of individual statistical observations (100).

College Parallel - refers to a program similar to what is offered the first two years in a 4-year institution. This work, if successfully completed, enables the student to move to the 4-year college with only two years to go for attainment of a bachelor's degree (78).

Community College - refers to a two-year institution of higher education, generally public, offering instruction adapted in content, level and schedule to the needs of the community in which it is located (78).

Community Services - refers to a range of services beyond the regularly scheduled classes of the college, whether held during the day or at night, on-campus, or off (78).

Completion of program - refers to any student who has met the goals of the program. Thus, any student who has either completed the two-year College Parallel program and/or transfered to a 4-year institution is considered to have completed the program as has any student who has completed a Career Development program and/or has joined the work force in his area of training. Thus, any student who enrolls, drops out of the program and initially works in an area not consistent with the training he received at the community college is not considered a completion.

Constraints - refers to known limitations and restrictions in the environmental conditions and the capabilities of human and material resources involved in the design, development, and maintenance of a system (16).

Developmental Programs - refers to programs designed to deal with inadequacies in the student's educational background. The orientation is not to work with the "mentally retarded" but to gear learning situations to those who have experienced limited social/educational privileges, advantages, and opportunities (78).

Disaggregate - refers to a process of breaking down a global measure into separate parts according to the various subcategories that make up the global measure.

Evaluation - refers to the process of determining the appropriateness of the system objectives when tested in the "real world" (16).

Feedback - refers to the information derived from a comparison of the actual output with the anticipated output used for purposes of quality control and system modification (16).

Goal - refers to an end state or ideal condition to be attained at some time in the future or a broad statement of intended accomplishment (21).

Input - refers to the raw materials that enter the system to be released as output (16).

Instrumental student-faculty contacts - refers to interactions between student and faculty that are means to some end other than the interaction itself (e.g. testing, signing registration forms).

Model - refers to a graphic or narrative description of an abstraction in the "real world" that is used to represent reality (16).

Monitoring social change - refers to documenting conscious and deliberate direction of social change (124).

Non-instrumental student-faculty contacts - refers to expressive interactions valued for their own sake (e.g. philosophical discussions, sharing coffee breaks).

Normative - refers to the value orientation of those involved in the system. The term recognizes that persons within a system tend to direct that system toward goals they consider to be "good" or "valuable".

Objective - refers to a statement that describes in observable and measurable terms the expected output performance of the system (16).

OJT (On-the-Job-Training) - refers to a combination of classroom and on-the-job experience (78).

Outputs - refers to newly developed resources generated by the system (which may become input measures for another or the same system).

Proxy - refers to an indirect measure of an abstract concept that is assumed to be sufficiently correlated with the original measure so as to be substituted.

Quality of life - refers to a master indicator reflecting the net effect of numerous subindicators such as occupational and educational status, health and housing (71).

Social accounting - refers to a system that evaluates a wide range of programs in order to determine the degree to which the program activities are satisfying the interests of the various "interesteds" by producing various quantities and qualities of output.

Social indicator - refers to a measure of social output or input that has reference to the attainment of some goal (71).

Social statistics - refers to statistical time-series data that describe the people in a society and their major institutions (133).

Social system - refers to a complex of human and non-human elements directly or indirectly related in a causal network, such that each component is related to at least some others in a more or less stable way within any particular period of time (33).

Subsystem - refers to a part of a system that is comprised of two or more components, has a purpose of its own and is designed to interact with its peer subsystems in order to attain the overall purpose of the system (16).

Systems analysis - refers to a technique for problem analysis wherein a system is analyzed in terms of inputs, throughputs and outputs.

Systems approach - refers to the specification of the interrelationships among input and output variables and the conversion process within the system by which inputs are altered in some manner to form outputs.

Value added - refers to the process in which an input unit receives added value, such as a student who enjoys an increase in knowledge and ability to perform tasks as a result of his interaction with the educational system.

Trade-off - refers to cost versus effectiveness studies, the purpose of which is to establish which of the proposed solutions (or what combination of proposed solutions) represent the most effective way of accomplishing the objective at the least cost (16).

Organization of the Study

This study is organized into six chapters. The first includes the problem, assumptions, definitions, limitations of the study, sources of data and organization of the study. The second chapter contains the review of literature including literature on social indicator research, education, and the community college. The third chapter includes the methods and procedures used in the study. The fourth chapter contains the findings, including numerical and statistical relationships. The fifth chapter includes the discussion, conclusions, and recommendations for further research. The final chapter constitutes a summary of this research effort.

CHAPTER II. REVIEW OF LITERATURE

For purposes of clarity the review of literature has been organized around the three areas of study that this research effort reflects. Material from social indicator research is presented in order to provide a framework upon which to base comparable research efforts within the educational arena. The second section on education is presented in order to show how specification of concepts offered by social indicators research are being applied to that societal subsystem. The third section of this review is on the community college and is presented as evidence that the issues confronting this institution are similar to those in education generally, and are therefore relevant to a social indicator approach for their solution.

Social Indicators

The social indicators movement

Even a brief review of the literature on social indicators reveal that policy-makers, lawmakers, and academicians are demanding social information that is not limited by purely economic considerations (155). The number of proposals concerning social reporting (or its virtual synonyms social indicators, social accounting and social intelligence) reflect a social movement orientation in which public and private agencies and commissions are joining with individual researchers and academicians in search for a better means of examining social, as opposed

to purely economic, aspects of society (67, 156).

The movement has been strongly promoted by a discontent with the continued use of traditional measures of economic progress (Gross National Product and personal income) not only as measures of economic progress but also as measures of political and social progress. Writers with this orientation note that only a small fraction of the existing statistics tell us anything about social conditions and those that do often point in different directions. Sometimes they do not add up to any meaningful conclusions and thus are not very useful to either the policy-maker or the concerned citizen. The authors of Toward a Social Report, (172) point out that economic indicators are insufficient measures as indicators of the social well-being of the country. They note that it is paradoxical that at a time when economic indicators are generally registering continued progress - rising income and low unemployment - the streets and newspapers are full of evidence of growing discontent. The reason for this paradox may stem from the fact that economic indicators are insufficient for precise assessment of conditions in the total state of the social system, (22, 66, 81, 80, 82, 123, 135, 161, 183). National income statistics leave out most of the things that make life worth living - the learning of our children, the quality of our culture, the advance of science, the compatibility of our families, the liberties and the democratic processes we cherish. They neglect the pollution of the environment, the depredations of crime and the toll of illness (135). Further, all benefits cannot be measured in direct monetary terms, many phenomena cannot be con-

trolled by monetary incentives or constraints alone, and non-economic institutions such as the family are valued (or not valued) for their own sake yet they still have serious consequences of the productivity of the economy (17).

Bauer (17) identifies several deficiencies in our present social statistics: they often do not mean what they purport to mean; there may be no data series for things we are concerned with; they may be out of date; some statistics are not taken with a sufficient number of samples to give adequate information for planning or other action for any unit for less the national level, and many of these statistics cannot be broken down even to the state level; our present series of social statistics do not constitute in any meaningful sense a "system" of data designed to reflect underlying social phenomena which are interrelated in a patterned fashion.

Realization of the inadequacies and flaws in the data we keep about our society has resulted in interest and action on the part of the U. S. Presidents (18, 141), legislators (154), committees in both the private and public sectors (71, 129, 130, 131, 133, 141, 172, 173), and individual researchers.

Perle (139) identifies two groups of persons who are discussing the usefulness of indicators; those who advocate the immediate utility of indicators for a wide class of societal issues both in the public and private sectors, and those who are cautiously optimistic about the eventual use of indicators for societal issues, subsequent to an intensive period of fundamental social science research. The first group

is composed of public and bureaucratic officials as well as academicians who are closely related to the political system; the second group is primarily composed of academics who are interested in understanding the structure and functioning of social systems but who are not intimately related to the political system in a professional sense. This categorization reflects a distinction between social science activists and research-oriented scholars, and the literature they produce is as diverse as their philosophical orientations.

The definition of social indicators

The diversity of opinion regarding social indicators begins with its very definition. The term "social indicator" must be regarded as an elusive concept (156) that is not clearly defined either conceptually or theoretically (100). The most publicized definition of a social indicator is given in Toward a Social Report (172, p. 97).

> "A social indicator, . . . may be defined to be a statistic of direct normative interest which facilitates concise, comprehensive and balanced judgments about the condition of major aspects of society. It is in all cases a direct measure of welfare and is subject to the interpretation that, if it changes in the 'right' direction, while other things remain equal, things have gotten better, or people are 'better off'."

Biderman (25) finds this definition restrictive because its emphasis on "normative" interests rules out indicators regarding conditions of society which are important to most of its members but which may have opposite normative significance for members with different interests and values. Further, the definition supports a tendency to think of social indicators as being primarily for knowledgeable use

by policy makers and officials and that they should therefore be indicators of manipulatable conditions. Sheldon and Freeman (156) concur that indicators of "normative interest" are too restrictive because what is relevant today may not be relevant next year. Second, they argue that the requirement that indicators need to be measures of welfare is too confining in that it rules out many variables that may be relevant to an understanding of the indicator.

Others refer to social indicators as some crude measure of overall well-being or a "good quality of life" that attempts to describe with some precision and detail, the condition of society in terms of particular activities and social groups (179), or as an aggregative or representative welfare measure, a statistic that measures the extent to which some social goal or general welfare has been acheived.(135). Sheldon and Freeman (156) point out that there is little consensus on defining the attributes of social indicators beyond the notions that they are time-series that allow comparisons over an extended period, and second that they are statistics that can be disaggregated or cross-classified according to relevant characteristics. Land (110) aggrees that the definition of social indicators as cited in Toward a Social Report is too restrictive. On the other hand, he finds the attributes provided by Sheldon and Freeman as not restrictive enough in that they do not distinguish social indicators from other social statistics. Given only these two criteria, he argues, there is little possibility of distinguishing the subset of statistics called 'social indicators' from the set of all social statistics that are available and

disaggregated in time-series form. His definition of indicators places them as components within the social systems model. He proposes that the term social indicators refer to social statistics that are components in a social systems model or some particular segment or process thereof, that can be collected and analyzed at various times, and accumulated into a time-series, and that can be aggregated and disaggregated to levels appropriate to the specifications of the model.

An advantage to Land's definition is that it does not restrict the definition of social indicators only to input variables. A social indicator can be any component in a sociological model of a social system and thus be either "input" or "output" variable. Second, his definition shows that there is a need to devote more effort to the specifications of models of social institutions. There is a need to specify the processes that occur as inputs into our institutions are transformed into outputs, and to estimate empirically the changes that occur in the inputs as a function of the transformations that occur within an institution (111).

Kamrany and Christakes (100) identify three kinds of indicators: absolute indicators, which refer to the measurement of those scientific indices for which substantial agreement among experts has been reached; relative indicators, which refer to indices for which time-series data and cross-comparison data are available and for which no optimum value is available; and autonomous indicators, which refer to those indices which reflect specific social, economic institutional and cultural values of specific regions.

Drewnowski (66) sees four kinds of social indicators: the first and second express the welfare of the population; and third and fourth refer to the process of social development. And Sheldon(155) states that there are three kinds of indicators designed for different uses: (1) problem-oriented or direct policy-oriented indicators which are intended for direct use in policy and program decisions, (2) descriptive indicators which are intended primarily to describe the state of society and the changes taking place within it, and (3) analytic indicators which serve as components of explicit conceptual and causal models of the social system or some particular segment of it.

The systems approach to social indicators

The notion that we should have a "system" of social statistics is spurred by the system of economic indicators which over the past 20 years have become a valuable tool in the guidance of our economy (17). The new Planning-Programming-Budgeting System (PPBS) of the Federal government which was launched in 1965 has been advanced by many as the logical framework in which social accounting and social reporting should be undertaken. Early social indicator research reflects the measurement of "input" as well as "output" data for assessing the quantities and qualities of public services. The intent is that these data are built into a logical structure capable of assessing social costs and benefits and aiding in more balanced decision-making in national policies and programs (180).

Becker and de Brigard (21) use a "relevance tree" or "top-down" approach common to PPBS as the basis of their model. Their hierarchi-

cal model has at its topmost level an entity they refer to as "quality of life" which is made up of a vast array of physical, social and economic human needs. Their model provides a method of examining the public and private resources for satisfying these needs. The lowest level of the hierarchy reflects the greatest amount of specification, and the highest level the greatest amount of permanency. According to Becker and de Brigard, increased specificity makes it possible to formulate more meaningful and less ambigious action items thus making it possible for the decision-maker to focus efforts on a particular need area and to search out the information required to make a decision relevant to the need area. Further, this approach, since it provides increasing levels of detail, makes visible the combination of factors that require consideration and decisions regarding implementation of programs and provides a clearer and more useful method for measuring progress towards goals. Their framework differs from the PPBS orientation in that it focuses on need categories as opposed to means for satisfying needs. Thus, they deal with the need for freedom from the effects of fire damage rather than on the existence, quality, and number of fire trucks.

The Educational Policy Research Center (71) using the variables of input and output as the basis for its model, presents a system of classification for categorizing indicator concepts that suggest how lower level indicators can be aggregated into master indicators within a hierarchically organized schema composed of two main elements, one relating to the individual within the system and the other relating to

the social system itself. This model provides for the development of social accounts in terms of inputs from society and outputs for individuals and groups and is similar to that provided by Becker and de Brigard in that it consists of a series of levels proceeding downward from the most global measures through increasingly more specific indicators to actual data. The highest level of the model, designated as "the general good" represents the complete correlation of society's performance and the individual attainment of society's benefits.

Gross's model (83) attempts to deal with the "selectivity-comprehensiveness paradox" that confronts any effort to establish a comprehensive system of social indicators or social system accounting. This paradox consists of the tension existing between, (1) the necessity that planners and evaluators should concentrate their attention upon a selected number of strategic variables instead of disbursing attention comprehensively and, (2) the need for a comprehensive view as a background for selection; Gross suggests a combination of broad systematic scanning and careful strategic selection and presents a hierarchical model that consists of "grand abstractions" at the topmost level and a middle level of "quantitive indicator concepts". The "grand" (but vague) "abstractions" in his abstraction-specificity pyramid relate to very specific information at the quantitative-indicator concept level. Gross argues that his general systems model can act as a general framework, one which can generate specific operational models that can describe any social unit.

These deductive approaches to model building provide for the

examination of a variety of numerous subindicators as well as for information on the net effect of conditions at the lower levels of the hierarchy. The validity of the information that is synthesized at the upper levels of the hierarchy depends entirely on the extent and accuracy of the material available at the lowest levels of the schema.

Although Sheldon and Moore (157) do not present a graphic model, they reflect a systems approach to rationally calculated policy formation and change. They propose five major rubrics for examining structural changes in American society: (1) the demographic base, (2) major structural components of society, (3) distributive features of society, (4) aggregative features of society, and (5) the meaning of welfare. Among the major structrual components of society they propose investigation of the production of goods and services, the labor force and occupations, knowledge and technology, family and kinship and religion and the polity. Bauer (18) presents no model as such but does suggest the construction of a general information system (a social indicators model), that takes as a point of departure the values, goals, and features considered important in assessing the state and direction of society (a normative orientation). Coleman (46) argues that social indicators must be developed to reflect four variations in subcategories: (1) the data must be evaluated and interpreted at a disaggregated level, (2) data from several indicators must be able to be recombined for a state called "combined conditions" allowing for partial reconstruction of the social unit from separate indices, (3) data must be able to be derived which does not show the whole of a given condition but only that part of which can be attri-

buted to a given cause. This level of variable measurement he calls "controlled indicators for combined conditions" and would show in a single measure, the partial deficits experienced by a given social unit (a combination of outcomes that result from a combination of social conditions).

These models can be distinguished on the basis of whether they deal with the aggregate levels or amounts of various social activities or whether they attempt to determine the distribution of the activities among the various elements of the society. In brief, the distinction is between models of aggregate levels of activities and models of the social distribution of activities (110).

Model building efforts are not without their critics and supporters. Olson (135) feels that social indicators and social reporting are logical extensions of PPBS and other forms of operations and systems analysis. He and Springer (161) state that application of PPBS as it now operates (mainly on a department-by-department or agency-by-agency basis) cannot, by itself, provide all the analysis that is needed for rational policy-making. It can usefully analyze many social problems but cannot take sufficient account of the interdependencies among different levels of government or different sectors of the society. PPBS cannot provide all the analysis needed for rational policy-making because it gives attention only to the activities of the federal government. Duncan (67) agrees by stating that not all issues on which some social report should be made are necessarily subjects for Federal programs and thus a close and fixed relationship between program appraisal and PPBS would be a mistake.

Sheldon and Freeman (156) point out that the development of social indicator models paralleling economic indicators is unfeasible because social indicators have no theory on which to base a definition and specification of interrelationships among the various social systems and because changes in the social realm are of a long-range nature which result in feedback that is in many instances extensively delayed. Thus, models requiring feedback for their implementation and improvement during the progress of the activity they are attempting to measure are not capable of being modified, altered, and manipulated so that benefits of a particular social program can be assured and errors in the direction of the policy corrected. The value of the feedback received within the social policy realm is questioned by Rosenthal and Weiss (147). They suggest that feedback within the social realm is limited because such feedback is a function of the articulativeness and power of the groups whose interests are affected. The more powerful and articulate the group, the greater the certainty of receiving feedback from the group. Less powerful groups may have feedback to offer but since they are not organized or do not realize they are being affected by a program, they do not generate the significant feedback. Thus social feedback may be inaccurate because of its incompleteness.

Weaknesses in specific models have been pointed out by some writers. Duncan (67) identifies as the weakness in Gross' approach the fact that quantifications in the "social" fields do not combine in a simple arithmetic way even in some abstract conceptual sense. Further, although Gross' model explicitly takes into account a multipli-

city of goals and can include a variety of partial models of cause-effect relationships, it only loosely indicates how this can be accomplished (161).

Generalized models such as offered by Gross provide only abstract categories that may sensitize one to social conditions but at the same time confront the researcher with unlimited and often insurmountable problems when attempts are made to explicate and operationalize these concepts into measureable indicators (177). Models that reflect social indicators as elements in a social system (as proposed by Land) do, however, correct the failure of social indicators to demonstrate interrelationships between social phenomena that is necessary for balanced decisions for social action programs (177). Biderman (25) agrees that the social statistics exist at various levels of social organization; the level at which the data are generated, the level at which they are processed, and the level at which the resulting knowledge is disseminated and at which it can have an influence on knowledge and action. The necessity of thinking of the total effect, not just the partial effect of any single programmatic decision or activity recognizes that the social system is just that, a system in which everything relates to everything else (173). Policy-making requires models that recognize these interrelationships.

The approach offered by Coleman provides promise in the initial stages of conceptualization of social indicators in that it focuses first on the concrete empirical level and secondly it attempts to conceptualize factors inherently a part of the social state of individu-

als from various socio-economic positions and population subgroups. Once these basic foundations of empirical measures are developed, it may be possible to work toward a more generalized conceptual model by combining these concrete indicators into more abstract indicators that provide a multi-dimensional profile of indicators and subgroups (177).

Claims and expectations for social indicator use

Diversity of opinion within the social indicator movement is reflected in the variety of claims and expectations for the development of social indicators and a system of social accounting. Gross (81) expresses the need for a system of social accounting designed to assess the priorities and goals of the "Great Society" more adequately. According to Olson (135) social indicators should measure what the national income statistics leave out and a social report should assess the social gains and losses that the national income does not measure. Sheldon (155) states that quantitative social information (indicators) is required for the establishment of social goals and priorities, the evaluation of public programs, and the development of a system of social accounts that could provide guidance among alternative interventions, further our knowledge of the functioning of society and enhance our capability in social prediction.

Springer (161) emphasizes five functions for social indicators: (1) assessing the state of society, (2) assessing the performance of the society, (3) anticipating the future, (4) indicating control

mechansims and, (5) guidance of social knowledge. Bauer (18) urges that social indicators be developed that will measure second-order consequences of technological change in our society, and the United States National Goals Research staff (173) cites the necessity of measuring second- and third-order consequences of various courses of action. Increasingly, they say, we must weigh immediate advantages in one area against long-term disadvantages in other areas of the social system. Thus, social indicators are necessary as tools to increase our capacity to make intelligent choices about the future and provide a system of technics by which we can approach the process of choice in a rational and deliberate way.

The National Commission on Technology, Automation, and Economic Progress (131) proposes a system of social accounts to indicate the social benefits and social costs of investment and services and thereby reflect the true costs of a product. Merrium (120) calls attention to the need for the development of social indices that are predictive as well as descriptive, and Voight (176) points to the need to refine measures of social change and to establish priorities among the various phenomena being observed.

The Social Science Research Council of the National Academy of Science (129) expects social indicators to serve several purposes: (1) they would be warning signals of dangerous or undesirable trends in the nation such as increases in crime or poverty and would call attention to the need for remedial action before the problems reached a critical stage, (2) they could assess the performance of our social

institutions and of special programs or policies established to remedy social ills and to move toward a more ideal society, and (3) they could serve as a basis for more informed and enlightened forecasting and action by both public and private agencies. According to Corning (54), any social indicator should, at minimum, tell us how well we are doing with respect to the basic problem of human survival and reproduction and provide us with a basis for evaluating the relative costs and benefits of various national policies in this regard. Others (71) state that indicators can measure relative progress toward goals by structuring them in terms of levels of attainment.

Duncan (67) concurs with Rice's characterization of the goals of the social indicator movement. Rice (145) states that "social indicators, the tools, are needed to find pathways through the maze of society's interconnections. They delineate social states, define social problems, and trace social trends, which by social engineering may hopefully be guided toward social goals formulated by social planning". (p. 173). Moore and Sheldon (124) are concerned with the use of social indicators for entry into the system to alter the magnitudes, speed or even direction of change in terms of explicit normative criteria. Senator Mondale (123) expects that the development of a social indicator system will provide information on the human conditions in our society allowing us to ward off social disasters and generally keep watch on the social processes in our nation and plan for its orderly development. He further expects a social indicator system to correct the current situation of a large amount of statistical

information that is incoherent in that it bears no readily apparent relationship to other data which has been collected. He expects, further, that a system of social accounts would seek to set up "performance budgets" in various areas to serve as a yardstick for measuring progress of improving the quality of life in this Nation. As such, a system of social auditing or accounting would serve the following purposes: (1) it would sharpen our quantitative knowledge of social needs, (2) it would allow us to measure more precisely our progress toward our social objectives, (3) it would help us to evaluate efforts at all levels of government, (4) it would help us to determine priorities among competing social programs, and (5) it would encourage the development and assessment of alternative courses without waiting until some one solution had been belatedly proven a failure.

Kamrany and Christakes (100) discuss the need for the development of adequate social indicators in order to measure the overall well-being of nations. And the United States Department of Health, Education, and Welfare (172), sees a social report with a set of social indicators as satisfying our curiousity about how well we are doing, improving public policy-making by giving social problems more visibility and thus making possible more informed judgments about national priorities and providing insight into how different measures of national well-being are changing, thereby ultimately making possible a better evaluation of what public programs are accomplishing.

Bauer (17) feels that the purpose of having a more adequate in-

formation system about man's state of affairs is to enable more rational action and provide the basis for closer coordination of actions on the part of various people. Bell (22) suggests that the idea of measuring social costs is an important dimension in the efforts to set up social indicators. A second source of interest in social indicators is reflected in the need to get an accurate "fix" on social trends in order to do useful social planning. Land (110) summarizes three recurring claims for social indicators: (1) social indicators can help evaluate specific programs, (2) develop a balance sheet or system of social accounts, and (3) set goals and priorities.

Sheldon and Freeman (156) take issue and challenge most of the claims made by the proponents of social indicators. They feel that there is a need to modulate the promises of the utility of indicators in ways to make them realistic. They feel that the social indicator movement can contribute to improved descriptive reporting, to the analysis of social change, and to the predictions of future social events in social life.

Several major themes permeate the indicator literature regarding their usefulness. They include: (1) improved descriptive reporting on the state of society, (2) the analysis of social trends and social change, (3) assessing the performance of society, (4) anticipating alternative social futures, and (5) social knowledge for societal control. These five themes, obviously have significant interdependencies. Unless there exists good descriptive reporting for the data base, it becomes extremely difficult to analyze trends and social

change, performance assessments yield questionable validity, it becomes almost impossible to anticipate societal futures, and the ability to exercise some measure of control over social processes becomes hopeless. To many observers, our society suffers from information overload, while simultaneously other observers claim we are desperately short of requisite information. Both points of view are probably correct (139).

Quality of life as a social goal

Wilcox and Klonglan (177) identify as one of the stages within the social indicator movement, the tendency to view social indicators as tools to monitor progress toward goals. This perspective has been expressed in two different ways in current literature; one way has been to focus on nationally articulated goals of a general nature (e.g. quality of life). Another expression of this approach has been to focus on the specific goals of agencies and programs (e.g. within education) and to generate indicators that are of direct normative interest to persons responsible for decision-making within these agencies.

Several writers in the field of social indicator research identify "quality of life" as a focus for model-building, definition, point of departure, and goals of social indicators. For these authors, the whole intent of the development of social indicators is to measure "quality of life" and to identify the variables within the social system that either contribute to or detract from the quality of life of

the general population or subgroups within the total population. Thus, Gross (80) in calling for a "real" state of the union message, directs that the President's annual report should not merely set forth a legislative program, it should deal with the quality of American life and our long-range national goals. The critical areas that he identifies as coming under the classification "quality of life" include freedom from discrimination, freedom for political and social participation, civil liberties and the administration of justice, employment and leisure, reduction of poverty, crime, delinquency and "social breakdown", the quality of the urban environment, and production of knowledge. "These important areas," he notes, "are either neglected in the economic report or, as with poverty and education, are treated in offhand, totally inadequate manner." (p. 9).

Olson (135) also presents a multi-faceted "quality of life" index that includes learning, the quality of our culture, the advance of science, the compatibility of our families, the liberties and democratic processes we cherish. Senate Bill S.843, The Full Opportunity and Social Accounting Act (154), reiterates this nation's policy to promote the general welfare "...and encourage such conditions as will give every American the opportunity to live in decency and dignity, and to provide a clear and precise picture of whether such conditions are promoted and encouraged in such areas as health, education and training, rehabilitation, housing, vocational opportunities, the arts and humanities..." (p. 975). Wilson (183) calls for a study of inter-regional differences in "quality of life" in the United States. He

identifies nine of the eleven domestic goal areas included in the Report of the President's Commission on National Goals published in 1960 as indicators of quality of life (141). Drewnowski (66) calls for indicators that measure the "level of living" but does not specify any variables.

Unlike the foregoing "social maximums" approach to quality of life, Corning's (54) identification is considerably less extensive. Corning says that "quality of life" is a single index - that of the survival chances of the species. And Krieger (108) suggests the use of "quality of life" as a dimension for indicating the state of our society. Like Corning, his concept is uni-dimensional and is identified as the quality of "friendship".

Wilcox and Klonglan (177) question the use of global and abstract measures such as "quality of life" as a conceptual framework for the development of a system of social indicators. They state that there is little doubt that "quality of life" is a universal goal of mankind. However, few, if any, human beings would agree on just what it is that constitutes quality of life. The previously cited definitions of the term bear out their argument. The implication is that the normative orientation and inherent inability to adequately specify the meaning of the term "quality of life" renders it relatively useless as a basis for delineating social indicators of high utility to public policy.

The Educational Policy Research Center (71) present the problems that occur when quality of life concepts and national goals form the

basis of research efforts. They attempted to array the data from Toward a Social Report in such a way as to yield some sort of "social account" but found that it was impossible to assess where the nation or its segments stand in the attainment of these specified goals. The reasons for this situation, they state, are that the data come from highly disparate sources with no apparent common interpretation base, and that the data are presented in a highly aggregated form. As a result, it is difficult, if not impossible to arrive at a "level of attainment" measure for a given group, a typical citizen, or even for a social function.

Educational attainment as a variable in quality of life

There is considerable support for the idea that this country places a high value on education and the concept of an educated citizenry. An "education" is placed among the variables that contribute to quality of life by several writers.

The authors of Toward a Social Report (172) in their consideration of "generally accepted goals" include a chapter on learning, science and art. Concern for second- and third-order consequences extends to the area of education. For example, the way we structure our educational system will determine the kind of preparation future generations receive and also, to a substantial extent, will shape their attitudes toward the American system itself (173).

Kahn and Wiener (99) centralize the role of education in the basic trend of human society. In their section on education, they

state that the trend of increasing literacy and higher education has a relationship to all other trends in the country. Emphasis on education in the United States opens up possibilities for increased personal creativity and fulfillment, continued rapid economic growth, and perhaps even more important, that of peoples' vocation being interesting, intellectually demanding, and filled with non-monetary rewards. They point to the fact that there can be serious disadvantages as well as advantages in such a trend. "An overemphasis on education can result in shallow intellectualism, an overemphasis on 'book learning', an expansion and prolongation of the adolescent subculture, a meritocracy, excessive theorizing and intellectual parochialism, alienation from one's own culture or subculture, and other alienation from the practical world." (p. 64)

Unresolved problems in social indicator research

A variety of social and methodological problems in the development of social indicators can be identified. Duncan (67) directs attention to the problem of the measurement of social change in the absence of a social theory that provides an analytical framework and enables an understanding of the relationships between and among the items of data that are measured.

On the other hand, there are those who state that theory in the social sciences is rarely sufficient for complete and detailed specification regarding how to accomplish relevant measurements. Thus, many quantities now considered to be well measured became so only

as a result of a long process of trial and error which eventually led to the evolution of a measurement technic and ultimately a standardization of it, even in the absence of social theory. Bell (22) as an advocate of the latter position states that in his opinion those who have approached the problem of social reporting with the strongest theoretical presuppositions have possibly made the least impressive contribution thus far. Others, (177, 179) propose a more inductive approach to the measurement of social indicators which, while not ignoring macro-models, focuses on smaller social systems and upon more concrete conceptualizations of quality of life. Their idea is to work inductively towards larger, more generalized systems as methodological technics are improved. Their approach attempts the development of a system of indicators that provide a sounder empirical and methodological basis than is offered by more abstract discussions and macro-model approaches currently being undertaken.

Gross (83) points to the necessity and to the danger of using "surrogate" measures. Some phenomena cannot be directly quantified. We cannot make direct measures of human satisfactions or of the quality of certain intangible services. But we can get quantitative measures by using, what he calls "surrogates", that is, indirect indicators which serve as quantitative substitutes for, or representatives of, the phenomena we wish to measure. Thus, the price someone pays for something is a surrogate measure of human satisfaction and assumes that there is a linear relationship between the amount of

money spent and the magnitude of the need that is satisfied. Similarly the number of additional university students in a given year is a surrogate of increased educational output. Both these surrogate figures may be of some use. They may be often used and often misused. They will be misused whenever they are taken too seriously. Etzioni and Lehman (73) examine three problem areas surrounding measurement for social planning: fractional measurement, indirect measurement and formalistic-aggregative measurement of collective attributes (e.g. global versus individual characteristics of groups).

Vestermark (175) reflects that social indicators have never had a final, higher-order aggregate to which reference could be made in manipulating indicators. Further, he believes that the approach taken in the social indicator movement has, in fact, interfered with the development of an apical standard because the focus has not been on social problems in the general sense and on their integration and interdependency as problem sets, but rather on specific problems of housing, education, crime and pollution. The result, he states, is that the social indicators available are statistics about conditions and trends in these kind of problem areas.

Bell (22) identifies as a measurement problem within the development of social indicators, the lack of a single lineal social statistical measure by which changes in the state of society can be measured. He feels that until a single meaningful measure comparable to the economic dollar, can be found there is no way to aggregate or to compare activities within the social domain. Bauer (17) identifies

some of the forces that act against the expanded development of a system of social indicators. The first factor relates to the issue of personal privacy. There is concern over whether certain types of personal questions should be asked and whether observation and recording of their behavior are not an invasion of the individual's privacy. Added to this is the concern that the central accumulation of data about individuals may make it possible to control or to harm them.

Bauer's is not an uncommon concern. Sheldon (155) has phrased the question as "Who reports What to Whom, How and How Often, with What Intent and to What Effects?" (p. 429). The question of Who raises issues of public relations, invasion of privacy, and credibility. Social indicators can become an "involved third party" in instances where special interest groups are competing for the same resources. What makes reference to the argument about what are or what should be social indicators, social accounts, or social statistics. Minimally, Sheldon says, we must have quantitative statements about social conditions and social processes, repeatedly available through time, the reliability and validity of which are competently assessed to meet minimum standards. To Whom should the information be made available? According to Sheldon, materials and data should be available to the public, to the Congress, to the President, to social scientists, administrators, and technicians and to all interested persons and analysis and commentary from as many points of view as possible should be solicited. The question of How makes reference to the method of how reports are presented and more basi-

cally how they are developed in the first place. Sheldon thinks that since a great many social conditions and processes will warrant description and that most of these will deal with the distribution and characteristics of persons, families and organizations, the sample survey is likely to be the method of choice. According to Sheldon, the question of How Often tends to have a more or less "natural" answer when the phenomena being measured and the time scale on which it moves is considered. The rhythm of observation and of reporting need not be the same for all measures. Subjects such as crime, health and education require annual reports, while five or ten year cycles of observation may be adequate for other subjects, she believes. The intent of social indicators, according to Sheldon is to enlighten and inform in some broad sense rather than in some narrow operational sense and to provide specific criteria for decisions and evaluation of public programs. Answers to the question of the Effects of social reporting are not possible according to Sheldon. She recognizes that it is possible that social indicators could be used by those persons in power to further their power base. However, the total consequences of the activity cannot be predicted.

Nathan (128) thinks that the responsibility for cataloging our social and economic needs should be lodged with the federal government but planning and policy formation should shift from the national level to sectors and regions at lower levels of the social system. Others feel that it is the federal government's responsibility to provide for increased linkages between bodies of data now routinely

collected (133). This, of course, must go hand in hand with both federal and private efforts to develop the means for protection of privacy and access to data centers should not be allowed unless individual and institutional privacy can be protected. Bell (22) states that it is the role of government to set up a set of social indicators for measuring the performance of the society and in meeting social needs. The task of constructing social indicators is more appropriate to government in Bell's estimation, because the idea of a social report itself is oriented to public policy and necessarily to the evaluation of government programs. Finally, "the responsibility for a social report must effectively be lodged in the government because the government alone has the resources to maintain such a large scale effort and because only a government report sufficiently assured of its independence, has the authority to command attention and become the basis of policy" (22, p. 84).

Like Bell, Mondale (123) supports the idea that data collection and reporting regarding the social well-being of the nation should be lodged with the government. His recommendation is for the establishment of a Council of Social Advisors that would be charged with devising a system of social indicators, appraising government programs and advising the President on domestic social policy. The data from the Council of Social Advisors would in turn become the basis for an annual social report comparable to the economic report submitted by the President. Duncan (67) states that although it must be taken for granted that any substantial social report will rely heavily on

federal statistics and its preparation will require cooperation with federal statistical agencies, this circumstance is hardly decisive as far as the assignment of responsibility for compiling a social report is concerned.

The National Academy of Sciences, Social Science Research Council (129) recommends that legislation be passed to encourage the development of a social indicator system and that the federal government make an annual report on the social aspects of society. At the same time they propose that behavioral and social scientists outside the government begin to prepare the equivalent of an annual social report to the nation in order to identify and expedite work toward the solution of problems connected with the eventual preparation of such a report on an official basis.

Future objectives for social indicator research

A vast amount of the literature on social indicators reflects differing orientations regarding what the next steps in the social indicator movement should be. Sheldon (155) recommends "the development of testable, explanatory models, particularly at the subsystem level" (p. 421). Springer (161) argues that more complete knowledge of cause-effect relationships is needed before effective management of society can occur and before society's managers will be able to work out compromises between conflicting goals. He feels that social indicator models should be developed in line with models of democracy and rooted in a social science that has been developed to serve the needs of the poor as well as the rich and powerful.

Statements by the Social Science Research Council of the National Academy of Sciences (129) reflect that although present knowledge of social science technics and tools are not fully sufficient to the task of serving as a basis for more informed and enlightened forecasting and action, the way to improve knowledge and technical capacity is to make a start - to try out some indicators and to work at improving them. In their estimation, the question of what data will serve as indicators of what states of the social system must be resolved. Others suggest the need to clarify such concepts as "the dignity of the individual" and the need to attain concensus on what is meant by such a concept. Once agreement on the concept is reached, there is the problem of deciding what phenomena in the "real world" represents these abstractions so that measurements can be made.

Kamrany and Christakes (100) feel that the development of a measure of social accounts has been fragmented and restricted to identifying welfare measures. Further, he says, it suffers from lack of a conceptual and theoretical framework. The next step for him, therefore, is to develop social indicators that meet the necessary and sufficient criteria for a theoretical basis. As specific next steps, Kamrany identifies the following: (1) a definition of the quality of life, setting up standards and units of measurement, methods of measurement and developing strategies for the implementation of policies as well as an organizational framework necessary for such a process, (2) the design of an information system for such a social indicator, including data analysis and simulations, (3) the development of a methodology

to accurately estimate costs of the short-falls as well as the costs and anticipated benefits of actually fulfilling existing goals and standards, (4) the establishment of priorities between and among various indicators, (5) the development of a methodology to include qualitative factors into the system, (6) the development of a methodology to provide links between local and national interests, links between physical and non-physical characteristics, and links between specific and general indicators.

Perle (139) identifies the need for better descriptive reporting on the state of society and the necessity of a descriptive data base that is comprehensive, valid, meaningful, and forthcoming on a regular basis. As the most serious problem facing indicator research and utilization Perle centers upon conceptual requirements - what should be measured and why. Perle also feels that we need to redirect our concentration away from aggregative forms of analysis that span the nation. Such an emphasis, he says, has relatively little utility for application in any specific problem area. And finally, Perle states that in order to justifiably realize the promise of indicators, not only is it necessary to suggest apparently brilliant conceptual models, but also to empirically verify them.

Biderman (26) concludes that the only practical objective we can set for ourselves is to take the existing statistical series now available as a point of departure and seek to improve the existing system but at an accelerated rate. He takes a dim view of the possibility of introducing any master plan of social accounting as a unified

package. His contention is that it is only by a hard analytical look at the role of statistics in our society and a cold understanding of why they take the form they do as opposed to some ideal scheme can we proceed to a better system. Bauer (18) suggests the construction of a general information system that takes as its point of departure, the values, goals and features of society that we consider important in assessing the state and direction of society. While such a general system could conceivably miss certain specific impacts of any program, it would, nevertheless, reflect those we regard as important.

The Educational Policy Research Center (71) suggest a more fundamental approach to data collection efforts that over time would generate three levels of social analysis: descriptive social reporting which would eventually lead to the possibility of quantifiable projected social trending, and with the further input of validated systems models, to predictive social accounting. This is the trend they see as the future development of social indicators. Olson (135) feels that the full potential of social reporting requires not only more information but vastly better theories of cause-and-effect relationships as well. Although social reporting will not reach its full potential in the near future, Olson does not feel that initial attempts at it lack usefulness. Bell's (24) emphasis is on the empirical, emphasizing the possibility of attaining useful precise quantitative descriptions of change. He assumes that such descriptions would be accompanied by analysis and possibly by theoretical synthesis and interpretation. Although description without interpretation may

provide a contribution to the development of social indicators, he feels that interpretation without description is fantasy.

Social indicators summarized

It is apparent that the direction of future research within the social indicator movement will be as varied in its emphases as has been the efforts during the past decade. The recent literature on social reporting shows that three attitudes are widespread: (1) dissatisfaction with the present state of the art in measuring social change, (2) appreciation of the appalling magnitude of the task of effecting significant improvement in that state, and (3) paralysis of our normal ability to take significant action (67). In relation to the last point, there is, according to Bell (24), apparently more interest in "talking about it" than in "doing it". The thrust of his memorandum is to suggest that there are things that are worth doing now, and that we know how to do. These efforts will clearly fall short of all our aspirations but they will bring us closer to our goals than will further exercises in pondering the nature of, or the philosophy surrounding social indicators.

Education in the United States

Past and current trends in education

The American people have set important national social goals to improve the quality of American life. The American ideology of equal

social opportunities permeates the history of the growth of public education. The widespread belief that mobility may be achieved or status maintained through educational attainment is evident in sociological and political theory. Education is perceived as the social mechanism permitting "meritocracy" and ameliorating the inheritance of social position (162). Educational history in this country reflects the American commitment to the ideal of education for everyone and the conviction that an educated population is essential to an effective democracy, to freedom and to economic growth (45).

In 1960, the President's Commission on National Goals presented proposals and objectives for education for the next 10 to 15 years. The goals covered the entire range of educational interests and indicated the direction for government and private programs. Twenty-five goals and a number of subordinate objectives were specified. Some goals were specific and subject to measureable evaluation, other goals were less subject to numerical assessments. Wilson (182) verbalizes the American hope that public education might make a reality of the Alger legend and also enhance social harmony by a process of cultural homogenization and through the teaching of inter-group tolerance, understanding and respect.

The asserting that public education should promote equal social opportunity commands widespread assent. Coleman et al. (50) however, challenge much of the conventional wisdom of the educational establishment. His "Report" suggests that because inequalities in achievement exist along social class and racial lines, the American

schools are reinforcing social inequalities rather than alleviating them (48, 49). Hanushek and Kain (86) comment on the fact that the best known finding of the Report, that the quantity and quality of school inputs such as facilities, curriculum and personnel have little or no bearing on student achievement and that the home environment and the student's peers are really what count, has far reaching implications for educational policy and at the very least, raises serious questions about the efficacy of the billions of dollars now spent on public education.

The Coleman Report emerged on the American scene during the same period of time when several significant trends were occurring within higher education. These events include: vast increases in enrollments and an accompanying rise in expenditures for higher education (63), a decrease in federal money available to higher education, the expansion of state-wide regional and national planning efforts (35), and the "student movement". These events have caused questions to be raised about the basic values and practices of colleges and universities, have contributed to an increased visibility of higher education, and have resulted in an increased awareness on the part of the public regarding costs, practices and policies within higher education (116).

Education is regarded by some as the magic solution to all our problems in society and because of its known failures in its application to these problems, it has become the butt of criticism and suspicion. Dressel (63) believes that part of the problem in higher edu-

cation results from the varied expectations of general public. Prospective students expect the college or university to provide courses or programs for every interest and every ability; individuals, business, and communities expect institutions to provide them with consultation and services on a no-cost or marginal cost basis. The Federal government and its agencies view colleges and universities as a market from which to purchase research at cut-rate prices. On and off the campus, others would have the institutions of higher education enter into and resolve problems of racial discrimination, pollution, poverty, and over-population. Dressel goes on to say that these differing expectations are encouraged in turn by a lack of clarity among institutions regarding their goals and the goals of higher education generally. Institutions of higher education, collectively and individually, are unclear as to their social purposes.

Recognizing that significant changes are being generated in the American educational system in terms of people, expenditures, activities and innovations, Cohen (45) urges for the development of educational indicators that take into account the variety of goals as well as the changes in definitions and emphases of these goals. He feels that there is a need for both quantitative and qualitative data and that although some quantitative data exists, it discloses little regarding the quality of the educational system or its product. New indicators relating to educational opportunities, the quality of education and resultant human behavior are needed. Cohen's urgings, picked up by legislators and the general public resulted most recently in a demand for accountability of the part of higher education. Although

this demand for accountability produced a resistive reaction on the part of many educators, there is a growing awareness that if educators will not change education, politicians will (70). Institutions of higher education are coming to understand that it is far wiser to be a part of the process of evaluation of their institutions than to be left out of the process. The problems in the development of such an accountability system (or a system of educational indicators) are numerous. They begin with the state of the educational data currently available.

Educational data

The weakness of the data and the lack of reliable and agreed upon measures for the evaluation of higher education are cited by several writers. The literature also reveals that education and assessment means different things to different people. Much of the literature on educational assessment and evaluation is restricted to consideration of evaluation of instructional programs (150). Despite the abundance of other kinds of facts regarding education, they are not sufficiently useable in that they have not been selected or aggregated in manageable form (94). The data available is neither comprehensive nor dependable (170). We have reports on the numbers of schools, buildings, teachers, and pupils and about the money expended. But we do not have sound and adequate information on educational results (75, 170).

Coleman (47) points to the fact that educators have typically

focused on school inputs (per pupil expenditure, class size, teaching preparation, age of textbooks, laboratory facilities, library size, etc.) as measures of the quality of the institutions. While these criteria are ordinarily used in evaluating the quality of a school program, they are not the sole criteria, nor even the principal ones, in his estimation, that the customers of education are interested in. The public is concerned with the outputs of a school, primarily in the form of academic achievement.

Ostar (138) is also critical of this standard for defining institutional quality. He says that what we need is a redefinition of educational quality which focuses on the educational process not the accessories. He goes on to state that quality in education should be defined in terms of how well each institution measures up to its own goals and objectives and what kind of impact it makes on its own students and what kinds of contributions its graduates make to society.

In 1968 Francis Keppel, then Commissioner of Education, noted that the Office of Education was collecting a lot of information about schools but that the information was almost entirely in terms of "inputs" into education rather than outputs from education. To counter this trend the NAEP (National Assessment of Educational Progress) program was designed to assess all knowledges, skills, understandings, and attitudes acquired by students throughout the country as they proceed through the educational scene (184).

The notion that educational assessment revolves around assessing

the students (what they have learned, what level of attainment they have achieved) receives support from Ebel (68) and the APGA (American Personnel and Guidance Association (76). Tyler (170) focuses on educational assessment in terms of furnishing overall information about the educational attainments of large numbers of pupils rather than focusing on individual students, classrooms, schools, or school systems. And Keller's (102) definition of the effectiveness of an educational institution reflects the concept of "value added". For Keller, "effectiveness is a measure of how much a given discrete increment of factual or conceptual material is transferred or added to the student." (p. 81).

During the course of a research effort to devise and list systems for measuring activities in colleges and universities, the National Science Foundation (132) found that cumulative data specifically selected for the purpose of institutional evaluation and maintained over a long period of time in consistent form does not exist. Hough reports (92) that the primary problem in the study of undergraduate education is the lack of consistent and reliable measures of the quality of the outputs of higher education. No inter-institutional comparisons can be made regarding student outcome in relation to students who complete baccalaureate degrees, those who drop out, and those who go on to graduate school. Hawkridge and Chalupsky (90) during a study to identify, describe and analyze programs which have yielded measured benefits of cognitive achievement for disadvantaged children found that data relating to effectiveness of programs, although obtainable, was

scarcely trust-worthy. They report that time after time they were confronted with weak data which were based on after-the-fact evaluation and which had not been analyzed or interpreted adequately.

Ferris (75) states that using goals as the basis for interpreting trends makes social indicators of the educational system a necessary adjunct to educational planning and evaluation. Serious planning for the educational system should always be accompanied by the development and/or use of indicators measuring the degree to which the goals of the plan are achieved.

The concept of goal assessment as a focus for educational evaluation is also supported by Cammack (35). He suggests that a systematic information system could answer such questions such as how well has the institution performed the task it was created to perform? Have the graduates been successful? Is the institution filling both social and economic needs locally, regionally, and nationally? What has been the relationship between program development and costs? What is the history of students who have entered the institution and completed programs successfully? Have resources been allocated according to stated objectives? Have faculty resources been wisely utilized in extending the boundaries of the campus to serve its region? Has competition with other institutions caused wasteful duplication of services? The answers to these questions involve looking at variables such as student populations, the faculty and its characteristics, the educational programs, the physical plant, the sources of income, utilization of facilities, patterns of instruction, and class size.

The issue of educational goals requires further clarification if appropriate social indicators are to be developed for the system. Cohen (45) defines the broader, basic goals of education in terms of developing the individual to his greatest capacity, contributing to his enjoyment of life and widening the range of choices available to him (a "quality of life" concept). Society is thus provided with a politically active and responsible citizenry necessary for a lasting and effective democracy and a healthy economy. Among the more narrowly defined goals he includes the need to provide equality of educational opportunities to all of the nation's citizens and the need to improve the quality of education for all. The interpretation of goals such as Cohen's are varied and the methods for achieving them is a problem that continually arises in the form of identifying and providing "quality education".

According to Dressel (63), institutions need data about the costs of educational programs, the impact of various educational policies, the relationship of student characteristics to academic success, the utilization of space, the effects of administrative decisions, and especially the relationship of expenditures to results. The latter, he feels, can be used to establish institutional priorities rather than having departmental aspiration guide decisions in the allocation of resources.

Dressel's orientation toward evaluation of inputs and outputs and the relationship that exists between these two variables is reinforced by Ferris (75). Ferris is concerned with focusing on the behavior of the system rather than on the behavior of students. He

is concerned with measures of input of which he says we have very few; and measures of output, of which he says we know almost nothing; and measures of the interactions between the two. Ferris, however, adds another dimension to input/output measurements by pointing to the fact that statistical measures across time not only serve to identify changes in the variable being measured, but also serve to forecast future changes in another variable (e.g. a reduction in freshman enrollment forecasts future reductions in graduate student enrollment).

As the foregoing paragraphs point out, much of the literature related to educational assessment is restricted to inputs or measures of outputs that are related only to the final behavior of the student. Thorough assessment in education requires a broader view. This prospect is not without its problems since some authors are critical of attempts to apply the notion of outputs to education. Brandl (30), for example states that where there are conflicting views or theories of "what is" or "what should be", there can be no agreement on what are the relevant outputs. This, he says, is the situation that exists in education. There are different viewpoints and different theories regarding the educational process, there is no concensus regarding what the appropriate product is, and there is disagreement regarding exactly who does benefit from education. These different views suggest different outputs and who is to say that one viewpoint is correct.

Lelong (112) agrees that definition of the outputs of higher education is largely impossible in any final social or philosophical sense.

Even when there is an agreement on what the final outputs of education are or should be, the final results can rarely be measured quantitatively. Therefore, he says, in developing analytical models, outputs are typically stated in terms of proxies or surrogates which can be quantified and which are presumed to approximate, at least partially, more meaningful but elusive entities. Student credit hours, student contact hours, courses taught, degree awarded, and student years of education, have all been used as proxies for outputs of the instructional function.

The fundamental purpose of educational evaluation, according to Astin and Panos (7) is to produce information which may be used in educational decision-making, that is, those decisions regarding the continuation, termination, or modification of an existing program or the development or possible adoption of some new program. Viewed in this way, every administrative decision is based on the belief in the existence of a causal relationship between some educational objective and a particular means selected to achieve that objective. They recognize three distinct components of the educational system: student inputs (the talents, skills, aspiration, and other potentials for growth and learning that the student brings with him into the educational program), outputs (the ends or objectives of the educational programs, usually expressed at high levels of abstraction such as "the development of the capacity for critical thinking"), and operations (the characteristics of the educational program that are capable of affecting the relevant student outputs). These components, accord-

ing to the authors, inter-relate with each other and the goal of educational decision-making is to select those educational operations that are most likely to maximize the student's performance on the desired outcomes. Astin and Panos' components closely resemble Stake's (163) three evaluative components of antecedents, transactions, and outcomes and as Sutterfield remarks (166), this approach is based on a process that is becoming common within higher education.

Several writers note the need for information concerning educational "operations" and there is agreement that the information that is typically available regarding educational operations is of relatively limited value. A potentially more useful kind of information according to some, would be comparative data based on a comprehensive taxonomy of "education environments." (5, 55, 172). According to these authors, a taxonomy that includes information on operations would permit educators to view the particular set of educational operations within the context of other programs with similar objectives. From a larger perspective, the existence of objective, taxonomic information on several programs permits the educational planner to view the characteristics of an entire educational system in terms of its diversities and similarities and identify gaps in the system.

According to Astin (4), the matter of assessing the outputs of higher education involves two basic problems; that of defining and measuring the relevant output variables, and that of determining the effects of environmental and student output variables. In relation to the second point, Astin states that regardless of how appropriate-

ly the output variables are measured, no management information system is of much use unless the causal connections between environmental variables and output variables are known. Astin and Panos state that to acquire trustworthy judgments about these causal relationships it is first necessary to conduct longitudinal studies that incorporate data on student inputs, student outputs, and college environmental characteristics (8).

There appears to be a growing recognition that causal relationships exist not only between student characteristics and the outcomes of education, but also between the educational operations and the outcomes of education.

Balderson's emphasis (14) links the resources used (inputs) to the results achieved (outputs). Balderson feels that information regarding the outputs of education are required by national and state public policy-makers and resource allocators who are confronted with making major commitments of public funds to the various activities carried on by institutions of higher education. Trustees, presidents and academic decision-makers generally, and the faculty and students within the individual colleges and universities have a need for information pertinent to the decisions they face. Information regarding the outputs of education are also of benefit to the representatives of various public and private clienteles who feel that higher education has an impact on them. Examples of these publics include employers of the trained talent which come from colleges and universities, users of basic and applied research findings which grow from scholarly activity, citizens at large who as parents, taxpayers, and critics dis-

play a kind of fascinated ambivalence about the importance and also the hazards of higher education.

Enthoven (72) identifies the purposes in searching for output measures as: (1) aids in allocation decisions within the institution, (2) aids in evaluating the effectiveness of different teachers, teaching methods, or curriculae, and (3) at the state or national level, aids in broader allocation decisions between higher education and other public programs. Enthoven thus introduces the idea that at levels beyond the single institution, the allocation of resources must ultimately deal with the social values of alternative allocation of resources to a variety of programs for the public good.

In summary, accountability on the part of higher education is necessary to justify continued support from the public. Accountability involves the process of evaluating inputs, operations and outputs at the college or university level, at the system of education level, and at the societal level. It has been suggested that information systems are required to determine exactly what higher education has been doing and what it can be expected to contribute to this society's general quality of life in the future. Expression of this "total systems" point of view is provided by the National Science Foundation (132). The Foundation urges that recognition be given to the fact that information systems at all levels of education must be capable of being intermeshed and that these systems should, in turn, fit into the totality of the scientific community and other comparable communities.

The systems approach in higher education

Many efforts are being exerted in order to overcome the lack of relevant, consistent and accurate data regarding educational institutions. Management information and analysis systems designed to add a new dimension to decision-making (providing the power of fact and reality to the wishes and aspirations of the institution) are being created and tested across the country. It has in fact, become common to speak of information or data systems for higher education. Such references appear to stand for procedures and processes related to the collection of bits of information needed to maintain a highly complex organization such as a college or university (or a number of universities), and more importantly, through a process of analysis to discover reasons why the system operates as it does and the chief factors causing it to operate in such a manner.

The fact that the educational system, either in the form of an individual institution or as a nation-wide system, requires analysis and assessment has resulted in several trends typical in systems analysis. These are: (1) statements of the needs that require satisfaction, (2) definitions of the educational objectives which contribute to satisfaction of the needs, (3) definitions of the limiting constraints which the system must satisfy, (4) generation of many different alternative solutions, (5) selection of the best alternative, (6) implementation of selected alternatives, (7) thorough evaluations of the experimental system, and (8) feedback, upon which modifications are based. The systems approach is a way of looking

at a problem and a way of seeking solutions to it. It is limited to the extent the problem can be described and the ways in which the elements in the system may be manipulated (159). By many, systems analysis is seen as useful in examining higher education in order to ascertain where and how it can become both more efficient and more effective.

Carter (39) comments on the fact that although systems analysis is a useful procedure when applied to appropriate kinds of problems, its proponents advocate an almost universal applicability. According to Carter, the careful application of systems analysis leads to better understanding and a more disciplined approach to the solution of problems. But unless the context within which the problem is being approached is sufficiently flexible so that systems analysis can be applied well, it may not lead to any particularly valuable results. If it is not possible to identify needs, objectives, constraints and alternatives or to select or implement the best alternatives, then neither systems analysis nor any other technic can be particularly helpful in trying to solve educational problems. Systems analysts, many of whom have a background in economics, bring to this examination technics, language, and ideas which have been found useful in business and defense. Use of the typical cost-benefit variety of systems analysis of higher education, especially in its approaches to students and faculty, are clearly attempts to impose upon higher education, a concept of systems derived from studies in industry and the armed services (159).

Several writings reflect the direct application of economic principles to efficient allocation of resources in the educational sector. For example, the Research Program on Systems Analysis for Efficient Resource Allocation in Higher Education is developing a university Program, Planning and Budgeting System (PPBS). This model is a direct application of economic analysis to education and is designed to contribute to the efficient allocation of resources in higher education. The objectives of the PPBS project are: (1) to develop a conceptual approach to the definition of education objectives and to indicate how broad objectives may be translated into operational goals, (2) to develop an educational program structure which will provide a meaningful basis for planning, budget, and management of educational resources by focusing on the basic objectives of higher education, (3) to develop quantitative measures of program output, (4) to develop specific systems and procedures for the annual programming and budgeting process and to define the role of decision-makers at various levels in the process, (5) to provide a system for periodic review of programs in terms of actual and planned results, and (6) to develop procedures and approaches to the introduction of PPBS systems into institutions of higher learning. According to Judy (98) the study of existing planning and budgeting systems has been completed and some preliminary PPBS elements such as program structures, PPBS cycles and information systems have been developed.

Brandl (30) disagrees with the application of PPBS to educational institutions. Such a model is useful, he states, when objec-

tives or outputs are known and the organizational entity is motivated to maximize them. Economists can classify measures and maximize the outputs with which they deal. But, according to Brandl, economics is not much help in determing objectives or outputs and it is misleading in situations where objectives are not maximized. This is clearly the case in higher education where there are numerous competing viewpoints regarding what is going on. Brandl goes on to say that existing evaluation technics such as PPBS were designed for organizations with incentives to efficiently produce agreed-upon products. In contrast, the college and university is in many ways a non-organization where there is no agreement on the product, the independence of individual faculty members is highly valued, and there is no inherent push to maximize.

Hough (92) disagrees with Brandl and supports the use of indicators in education. He makes the assumption that institutions of higher learning are decision-makers in a fashion which makes them directly comparable to business firms whose operations reflect micro-economic theory. Because institutions of education possess clearly specifiable goals and instruments for attaining these goals, and because they operate in environments which constrain them, they are similar to the business and industrial operations in an economic sense. Further, according to Hough, the outputs of education can be viewed in a purely economic sense. That is, from the student's point of view, education will add to his economic rewards in terms of value added; from the public's point of view, educational outputs relate to the direct benefits to the public in terms of institutes, seminars,

training programs and making institutional facilities available to them; from the private industry point of view, educational outputs take the form of reliable sources of employees of a given quality as well as faculty consultants and physical facilities. These are the "production functions" of the educational realm. Thus, institutions of higher learning may be characterized as profit-maximizing institutions insofar as they may restrict their output, raise their prices (costs of admission) and return profits from tuition back into the organization.

Brown's (32) framework for evaluation of the outputs of education is based on the centrality of the notion that the institution acts as the environment through which the input (student) passes through to become an output. The objective of the environment is to add value to the input. The environment consists of human resources (e.g. faculty, administration), physical resources (e.g. buildings), tactics (e.g. teaching methods), and methods of relating resources to inputs (e.g. governance). According to Brown, the net value of the output equals the gross value of the output minus the gross value of the input. The similarity of his model to the Consumer Price Index reflects his economic orientation.

One of the problems with Brown's orientation and formula is its assumption that inputs are standardized. Unlike the area of economics, student inputs into the system are not equivalent to each other. It is known that the ability of different students and their final level of achievement is related to socio-economic variables, sex, race, and individual ability and motivation. These variables, as

well as previous academic experiences have to be taken into consideration when comparisons regarding student output is under consideration.

Model-building in education

Planning, according to Cammack (35) may be done without regard to fiscal implications or it may be focused almost entirely on resource requirements with little regard for the program aspects. There are dangers in either of these orientations. Planning that disregards the fiscal aspects of program development because it tends to be unrealistic, becomes an academic exercise. On the other hand, if the primary design of the plan is fiscal it can overlook program implications and thereby provide no means for innovation and/or future reevaluation. A composite approach in which some attempt is made to bring together the program delimitations and the fiscal projections are reflected in a variety of simulation models. These models provide a method for determining programmatic, fiscal and resource allocation decisions without actually committing the institution to the actuality of the experience.

By definition, a model is a representation of an object or system which is designed to look like or act like the real thing. One type of model typically used in education is the budget model which includes on the income side tuition, gifts and grants, endowments and other income. On the expense side would be instruction, library, administration and physical plant (166). Many colleges still use the budgeting model to decide resource allocation. This concept of

budget-as-planning method is fast becoming obsolete, however, because budgets consider only the fiscal aspects of a college university, the usual budget usually does not plan further ahead than one year, and the budgeting process is usually a cumbersome annual operation lacking the flexibility necessary for examination and comparison of alternatives (104).

Simulation models are often used to project the consequences of specific decisions for change as well as for situations where current trends and practices are simply extended. The use of the system is, however, only as good as the data and relationships that go into it (166). A simulation model is a mathematical description of the interrelationships of the major functions and processes which occur within the various organizational entities of an institution. These models enable the administrator quickly and precisely to test the effect of change in key factors of a college or university and operation on overall institutional performance. The model can simulate present activities with all their existing facts and constraints or use estimated future facts to simulate future activities. Several large computer simulation models have been developed and there are three that were designed to be "universal" models applicable to a variety of institutions. The three major modeling systems available to colleges and universities are RRPM (Resource Requirement Prediction Model), CAMPUS (Comprehensive Analytical Methods for Planning and University/College Systems), and SEARCH (System for Evaluating Alternative Resource Commitments in Higher Education).

RRPM-1 is concerned primarily with simulating the costs of institutional programs in Higher Education. It is anticipated that later versions will deal with the simulation of the research and public service functions of higher education. According to Gulko and Hussain (85) the development of this system will greatly facilitate the planning and decision-making process although its actual implementation on college campuses will require prior decisions concerning costs of initial installation and maintenance. The cost has been estimated by the developers to run between $10,000.00 and $38,000.00 initially and between $6,000.00 and $15,000.00 per year for recurring costs. It seems apparent that the smaller college with a limited or non-existent data base and little or no currently available knowledgeable personnel for RRPM and with no computer at its institution will have the greater cost initially as well as on a continuing basis. Further, it appears that RRPM as it is currently constructed is most useful to those institutions which have a variable enrollment, with substantial projected increases (or decreases) in student enrollment, and in which instruction is the dominant activity (143).

CAMPUS (37) is a group of computer-based simulation models for educational institutions which predict resource requirements based on student enrollments at the institutional level, at the departmental level, and at the discipline level. CAMPUS is more flexible than many models in that the administrator can decide at what level of the institution's structure he wants to begin his simulation. The decision is a major one since if he begins his simulation at too high

a level, the model will not produce enough detailed information. However, if he begins at the level of specific courses and builds up a model of his college from there, the time, effort and expense required for the collecting and sorting of so much specific data makes such an application unfeasible (36). Lombus (115) reports that the CAMPUS VII program has provided his small college with more analysis at less cost than expected and has enabled the institution to make confident decisions about program cuts and new emphasis undertaken at a new time of great flex in local and national conditions.

The objective of SEARCH (153) is to give the management of a small college a tool for examining the implications of alternative policy decisions. The inputs of the model are highly aggregated, however. SEARCH can provide estimates of several macro-variables such as departments or majors that would be helpful in deciding on the initial allocation of resources. This model, however, can be quite useful to smaller schools where there is yet little or no formal planning.

Gulko and Hussain (85) comment on the fact that although a number of sophisticated simulation models for higher education have been developed, these models have not been widely implemented at operational levels within institutions of higher education for several pratical reasons. The fact that existing demands on the institution's staff and lack of significant resources for internal management application prevent any serious attempt at implementation of these models on the part of individual institutions. Further, simulation models in higher education are not sufficiently

proven at this time to warrant a level of confidence sufficient to persuade administrators to change their current methods of budgeting and planning.

A variety of other research and evaluation models have come into existence. These models were not developed with the intention that they would be universally applicable within institutions of higher education. Hopkins' (91) Cost Simulation Model (CSM) is based on the fact that students enrolled in one program area of an institution make demands on other departments' resources and that students in both departments make demands on college-wide resources (e.g. the library). His model reflects the linear function of system activity variables on resource requirement variables. His own conclusion is that the collection and processing of data for CSM requires a major investment of time and money on the part of the institution. Further, it is fairly easy to get wrong answers to seemingly well-defined questions by blind application of the model.

Reiner and Robinson (144) have developed and tested a modification of CUES (College and University Environment Scales) that corresponds to institutional statements as a method for gathering information regarding the extent to which the educational institution is achieving its goals. The staff at the Ohio State University Evaluation Center (166) has been engaged over the past several years, in efforts to advance the science of educational evaluation. Their model, CIPP (Content, Input, Process, and Product) identifies four kinds of evaluation parameters; content evaluation (to be used when a project is first being planned), input evaluation (the identification

and assessment of relevant capabilities of the institution), process evaluation (as a method of providing periodic evaluation to project managers), and product evaluation (to determine the effectiveness of the project after it has run its full cycle). Worthen (185) comments that although this model is deceptively simple and manageable in theory, such an approach presents the evaluator with the task of making a selection of alternative actions for each decision based on a set of alternatives that are particular to that decision.

Huff (93) supports application of the "Student Flow" model developed by NCHEMS. This model, intended to be implemented once an institution knows its current program costs and outcomes, uses transitional probabilities to forecast the flow of students between majors from one year to the next. The limitations of this model relate to the fact that forecasting student demand is dependent on many uncontrolled social and student variables and unreliable student registration data may affect projections. Caldwell (34) provides a framework within which the concept of input evaluation (the assessment of inputs which an institution is willing or able to invest in order to realize certain outputs) might be viewed and suggests a systematic approach for implementing input evaluation. To end what he calls "impulsive development" and to enable the institution to withstand increasing pressures, Brien (31) advocates an administrative model incorporating a university-wide management information system.

Montor (122) points out that at present there is little information available as to how systems analysis is being used in academ-

ic institutions. Although it can be stated that there is some use, there is no systematic body of knowledge as to how systems analysis has been used and the degree of success achieved. She believes that among the needs of the educational community is a need for a system of transferring knowledge gained through institutional research at one campus to other campuses. In this way the almost total lack of unifying effort to make the results of improvements known to the academic world at large will be eliminated.

In his comments on the modeling exercises employed in higher education, Lelong (112) points out that these models are designed to make possible the optimum use of resources according to a set of carefully specified output objectives for one sector of the institution, or for the entire institution. Therefore, he says, model-building assumes the ability to quantify the desired results of institutional activity at all levels of operation. It also assumes complete knowledge of the relationships between all resource inputs and desired outputs at each level. Further, these models depend upon relationships between inputs, outputs, and production function relationships in order to answer the specific "what if" questions asked of them. Yet knowledge of these input-output relationships depends upon accumulation over several years of vast amounts of empirical data describing actual college operations. Lelong suggests that resource allocation models and similar tools will find their greatest application at top administrative levels in large universities and at the state and national levels. At these levels resource allocation decisions usually refer to larger aggregates.

Models, therefore, can help define relationships among aggregate resource inputs and show the connection to aggregate outputs.

Other methods of educational evaluation and assessment

Other attempts to evaluate the institutions of higher learning include processes known as "institutional studies and surveys". Surveys and studies of higher education's needs and problems may be national, regional, or state-wide in scope or they may pertain only to institutions of a certain type such as liberal arts colleges, land-grant colleges, graduate schools, colleges of business, community colleges, or technical institutes. The studies vary in purpose and are sponsored by many different agencies. Some are primarily collections of statistical data on such items as faculty qualifications, student enrollments, faculty salaries, and student fees. Other studies are analytical in nature and still others focus on the effectiveness or efficiency of certain types of programs or on the adequacy of existing facilities and the need for new ones (95).

An institutional survey or study conducted by an outside agency or group is considered "complete" when it includes at least six of the following areas of investigation: enrollment, organization and administration, finance, programs, faculty physical plant and control and coordination (95).

In contrast to institutional surveys or studies conducted by agencies outside the institution itself, the institutional "self-study" refers to the completion of data by those persons directly associated with the institution (65). The purpose of institutional

self-study or self-evaluation projects is the re-examination of the philosophy and objectives of the institution, the validation of existing policies and procedures, the improvement of an existing practice, and/or the institution of new practices.

The establishment of state-wide coordinating and governing boards has been based on the perceived need to establish standards among institutions of education. In 1970 there were 17 state governing boards and 27 state coordinating boards. These agencies in varying degrees, require and process data from institutions, review and approve budgets, review and approve new programs, and assign institutional roles.

Lelong (112) identifies two common approaches to resource analysis in higher education, trend analysis and comparative analysis. Trend analysis or time-series, portrays past and estimated future directions of individual variables such as enrollments, faculty members, appropriations, instructional space, budgets, and other operation characteristics. Typically included in trend analysis are pertinent ratios bearing on the deployment of resources such as student/faculty ratios, space utilization statistics, student credit hours or classroom contact hours per full time equivalent faculty member, or educational and general dollars budgeted per full time equivalent student. A second common form of resource analysis deals not with self-comparisons over time, as does trend analysis, but with comparisons of inputs with outputs among similar units. According to Lelong (112), it usually makes more sense to compare chemistry departments, schools of music, or business administration programs with

like units across institutions rather than with each other merely because they are part of the same institution. Again, enrollments, budget, faculty salaries and student/faculty ratios constitute frequent bases of comparative analysis. However, differences in objectives, programs, nature of the students, and nature of the facilities, place severe limitations on the validity and value of the comparisons made within and across institution. Only if the intent and bases of the comparison can be spelled out clearly, are comparitive studies likely to be useful in evaluations of resource utilization.

A problem with making comparisons across similar units is that it allows for the possiblity that information regarding consistent deficiencies in a particular program across institutions will never show up in the data, because the units will be equivalent to each other (e.g. if Career Development programs consistently receive less money than College Parallel programs, the data would show they are equivalent across institutions but would fail to reveal their lower priority).

Trend analysis and comparative analysis can be, and often are, combined and they sometimes point up subtle shifts in resource allocations. These types of analysis, however, exhibit the "sin of half truth"; they are incapable of telling the whole story. Lelong urges that some means of simplification enabling analysts and decision-makers to trace all the major variables of resource flow and resource productivity appears to be indispensable if we are going to improve both the utilization of resources and our capacity to explain

what is being accomplished in higher education.

Education summarized

The literature on educational assessment in the United States reveals a variety of efforts to specify the goals of education in terms that lend themselves to measurement and to establish cost-benefits analyses (both economically and socially) regarding the outputs of education. Attempts to broaden the traditional focus on the inputs of the educational system have resulted in the development of a variety of information systems reflecting a systems analysis approach that includes both inputs and outputs. The models developed thus far are limited in applicability and informational value.

Most research related to determining educational benefits centers at the institutional level or at the education system level. There is little consideration of placing educational benefits within a broader social benefits perspective - one that recognizes the interrelationships that exist between that institution and societal activities of a non-educational emphasis.

The Community College

The roles and goals of the community college

The American goal of universal higher education, recently translated into the familiar phrase "equality of educational opportunity"

reflects the normative value that higher education holds in terms of quality of life for the American people. Universal higher education has specific relevance to the development of the community college system.

The community college is an outgrowth of the idea embodied by the junior college. This idea, conceptualized by William Rainey Harper, President of the University of Chicago was to offer out-of-university programs consisting of two years of classwork beyond high school. Those students who successfully completed this work could be accepted by the University of Chicago at the third year college level. At its initial conception stage, the populations to be served (and not served) were essentially the same as those served by the university.

The ideal of providing universal education through the 14th grade, announced officially as a national goal by President Truman's Commission on Education in 1948 and reaffirmed ten years later by President Eisenhower's Committee on Education (114) and in 1964 by the National Commission on Technology, Automation and Economic Progress (131) created the impetus for the development of a unique type of institution. The community college emerged to meet the needs that other institutions could not or would not meet (114) and to respond to the cross-section of Americans who possess a wide spectrum of interests, aptitudes, backgrounds, aims, achievements, and cultural differences who were beginning to demand the exercise of their citizenship rights to higher education (56, 78).

The roles and goals of the community college have been specified by several national committees. In 1972 the American Association of Community and Junior Colleges (3) reaffirmed what has been their mission over the past several decades; to bring the concept of educational opportunity for all even closer to reality, to provide a broad spectrum of programs which will meet the individual needs of all people in the community, and to seek out potential students.

The statement by the National Advisory Committee on the Junior College (130) in 1964 reflects the idea that the community college program should not be so exclusively vocational that it shuts off the extension of cultural horizons or restricts adaptability to change on the part of any segment of the American population. The Committee stated that every two-year curriculum regardless of whether it is vocational in nature should include at least several basic courses in languages, arts, and social sciences in order to guard against "over-specialization" and to assure accommodation to societal changes on the part of the citizenry (130). Gleazer (78) supports the idea that an alternative between technical or general education should not be posed. The two should be interfused in the courses of study offered students. The Carnegie Commission (38) states that community colleges should be available within commuting distance to all persons, throughout their lives. The Commission defines community colleges as comprehensive institutions offering programs with academic occupational and general educational emphases. These institutions, in the opinion of the Commission, should remain relatively small

2-year institutions, should give the full support and status to occupational programs, should maintain an "open-door" policy for all high school graduates, should charge little or no tuition, should provide occupational and personal guidance, should be governed by local boards or at least have local advisory boards, and should be financially supported by federal, state and local governments.

Farris (74) and Roucche and Baker (148) emphasize the role of servicing the needs of students within the community college district. Because these needs are numerous, diverse and change with the changing patterns of the society, the 2-year college, according to Thornton (167) must continuously study the community to learn the educational needs of its constituency and provide courses of two years duration or less that will accomplish socially desirable results.

In 1973 there were 1,141 non-profit community colleges with a combined enrollment of 2.8 million students in the Fall of 1972 (51). Several authors reflect on the amazing growth and development of this unique institution within higher education (16, 56, 77, 88). Barbee (16) expressed the opinion that enrollment in community colleges will continue to skyrocket in the future and Ferris (75) notes that as at least a junior college education becomes more and more prevalent, information on 2-year college will be needed to a greater extent.

The vast array of the demands placed on the institution have served to blurr its image (60), and have prompted several writers

to speculate on the ability of community colleges to become in fact, open-door colleges (77). Moynihan's comments (127) reflect a lack of conviction that the community college will in fact accept the responsibility of providing universal higher education by providing the kinds of educational programs suitable for the heterogeneous population it is intended to serve. Corcoran (53) states that the primary beneficiaries of the community colleges have been middle-class students of average ability who seek an inexpensive and unpressured way to enter higher education or as an easy way to satisfy parental or peer expectations. He questions the belief expressed by the Carnegie Commission and others that by expansion of access to community colleges, the national goal of equal opportunity of education will be achieved. Cohen and Brawer (43) see many problems in the community college being "all things to all people" as it attempts to select those who will go on to 4-year colleges and universities, train workers for industry, maintain custody of young people for a few years beyond high school, and enhance the development of the general population. Cross (56) admits that some community colleges are simply weak copies of traditional higher education institutions and thus, have not broken out of the old mold of traditional higher education.

Supporters of the community college, its concepts and its goals are as numerous as critics. Harper (88) states that the majority of this country's community colleges have lived up to expectations in varied degrees. He states that the community colleges

have had a tremendous impact on the cities in which they are located in terms of meeting educational needs, providing cultural resources, contributing to the health of the economy, and improving inter-cultural relationships. The number of lives, he states, positively affected by the community colleges in these centers number in the millions. Lombardi (114) also states that there are indications that the community college has fulfilled its commitment to educational change. His rationale is based on a comparison of catalogs of 1946 with those of 1973 which reflect the tremendous changes in curricular offerings. And Medsker (117) states that the 2-year college is indeed performing its many functions and some are truly "all things to all people".

The community college as a system within a system

Commonality among community colleges allow it to be conceived of as a distinct system and examined as such. As Gleazer (78) points out: "An overview of community college activity throughout this nation shows the states using a variety of ways to organize and finance community college service. Although no national consensus is apparent, there is enough agreement to suggest a general profile of this ... institution ..." (p. 36). The common elements include: participation in the overall state educational plan, admittance to all students "who can benefit", charging little or no tuition, comprehensive programs, aid to uneducated students of post-high school age, and local control.

The specific program offerings are also well standardized. Community colleges exist to: provide a college parallel program for those wishing to transfer to 4-year institutions, provide a career program for those wishing to enter the job market, provide a program of counseling and guidance, provide a developmental program for those deficient in some academic areas, provide a broad program in adult education, and provide a broad program of community services.

Besides being a system in and of itself, the community college exists within the larger system of education and is both an actor and reactor to activities within that system. Clark's (41) examination of San Jose Junior College in California provides insight as to how this relationship operates. When the community college assumed prime responsibility for vocational education in the area, the vocational programs under high school administration needed to be redefined. Further, the existence of a 4-year institution within the region served by the community college affected, through its admission and retention policies, the number and kind of students that the community college received. If the 4-year institution lowered its entrance requirements or failed only a few students, it could immediately draw students from the community college. If it raised its standards of admission or failed large numbers of students, it could flood the community college with students. Thus, the presence of a 4-year college or university near a community college sharply affects the degree of control the community college has over its size, composition, and duration of its own student body.

The relationship of the community college to other institutions of higher education, is in many instances formalized. In 28 states the activities of the community college are coordinated to varying degrees by a state board responsible exclusively for community colleges within the state or responsible for all higher educational institutions. In five states, community colleges are coordinated or operated by the same board that is responsible for the state universities and in eight states coordination or control is achieved through staff services of the state education department (164).

The fact that the community college exists within the total social system and is influenced by societal pressures is reflected by Cohen (42). He states that community college goals are drawn from sources both extra- and intra-institutional. Whether programs are labeled liberal arts or general education, vocational preparation or community services, goals are influenced by board policies, social pressures, type of students, administrative orientation and a host of other factors. Thus the role and functions of the community colleges are determined normatively by the students, by the state, by the high school district, and the neighboring colleges and universities (41), as well as by a national political ideology.

Since the community college has become in a very short time a significant element on the social scene, it is necessary to determine if the system is fulfilling its promise. Ferris (75) calls for follow-up studies in order to provide a basis for decisions on curriculae and on the quality of instruction at the 2-year institutions.

He goes on to say that since the 2-year institution includes non-degree credit programs, information on the number of enrollees according to type of program could provide a basis for judging how adequate training facilities are relative to the need in industry. Similarily, the number of persons graduated with Arts degrees and the number certified as having completed technical and semi-professional training are needed. With approximately 30% of first-enrollments in 2-year institutions, "feeder" relations of 2-year to 4-year institutions have been studied by Knoell and Medsker (105, 106, 107).

Some writers have advanced the idea of a systems approach to the evaluation of community colleges. The American Association of Community and Junior Colleges (3) recommends that community colleges commit themselves to developing management systems for deriving and using responsible, standardized data about resource allocation, how the college programs respond to student needs, and what happens to former students. Roucche and Baker (148) present an operational plan of action for accountability within the 2-year college. According to Barbee (16), the systems approach must be applied in order to meet the challenges of increased efficiency and effectiveness in establishing and meeting institutional goals. This approach will demand a clear definition of goals and objectives, a delineation of constraints, a description of measures for effectiveness, a synthesis of alternative solutions, the establishment of cost elements, cost-effectiveness analysis to establish trade-offs among alternative solutions, and continuing evaluation and feedback. This, he states, is a necessary

process for the solution of problems confronting community colleges now and in the future.

The community college summarized

The community college system shares some of the problems of the larger educational system. The expectations regarding the societal benefits received by the inception of the system are high and varied. Although many persons in the society have been affected by the emergence of the community college, identification and measurement of actual benefits derived has not been accomplished. Therefore, this educational subsystem is taken in this research project as a vehicle for attempting to apply social indicator concepts to the educational system.

Summary of Literature Reviewed

Literature from three sources has been presented. Several parallel efforts are occurring within the areas of social indicator research and education. Writers in these fields are concerned with the need to specify the roles and goals of our institutions and to establish methods of accountability for institutions and programs. In both areas the concept "quality of life" predominates as an ideal toward which institutional activities strive.

Model building based on a systems approach has been a significant activity in both social indicator and educational research. Both

areas have attempted to adapt an economic orientation and found it inappropriate. Both are confronted by a lack of overall theory to guide their actions. Both are attempting to provide a method for accountability and both are confronted with weak data that inhibits research toward that end.

The community college, as the embodiment of equal educational opportunity, ideally provides a route toward "quality of life" for American society. Methods for assessing its actual contribution in extending and broadening educational opportunity have not been determined, although the need has been specified.

The foregoing review presents the possibility that progress and developments in the social indicator movement could help the institution of education and its component branch, the community college, toward the solution of its problems related to evaluation and assessment of benefits derived. It also appears that communication between writers in the areas of education and social indicator research would enhance the efforts of both. The research presented here represents a first step in this direction.

A model has been designed which reflects a social indicator "quality of life" orientation, a hierarchal approach for depicting the interconnections between society's subsystems and a concern for delineating social states, defining social problems and tracing social trends. The model focuses on the educational sub-system of community colleges. It was designed as an instrument for examining the social benefits derived from the existence of community colleges

and is offered as a tool for monitoring that sub-system. The purpose of this research effort is to attempt to determine the feasibility of the model for such use by community college administrators and policy-makers at the local and national levels.

CHAPTER III. METHOD OF PROCEDURE

This section is divided into two parts. The first part presents the process of model construction and the rationale behind its development. The second part presents the procedures used for testing the model including rationale behind selections of variables examined.

The Model

Development of the model

The final form in which the model is presented (from the most abstract global level of social indicators to the lowest level of specific educational indicators) does not reflect the sequence of activity involved in its construction and development. Rather, a more inductive approach as recommended by Wilcox and Klonglan was used (177).

Initial development of the total model began with Figure #3 (Activities of the Community College) depicts the six program areas offered by community colleges. Figures #4 through #9 were developed at the second stage of the model-building effort. This step involved identifying those input and output variables significant to each of the program areas. The input items were fairly easy to determine since the majority of the educational assessment data involves these constructs. Most of the input items, although not all, reflect the data usually accumulated in studies on education. The development of the output variables required specification of significant and

measurable proxies for abstract educational goals such as "learning", "responsible citizenship", and "values".

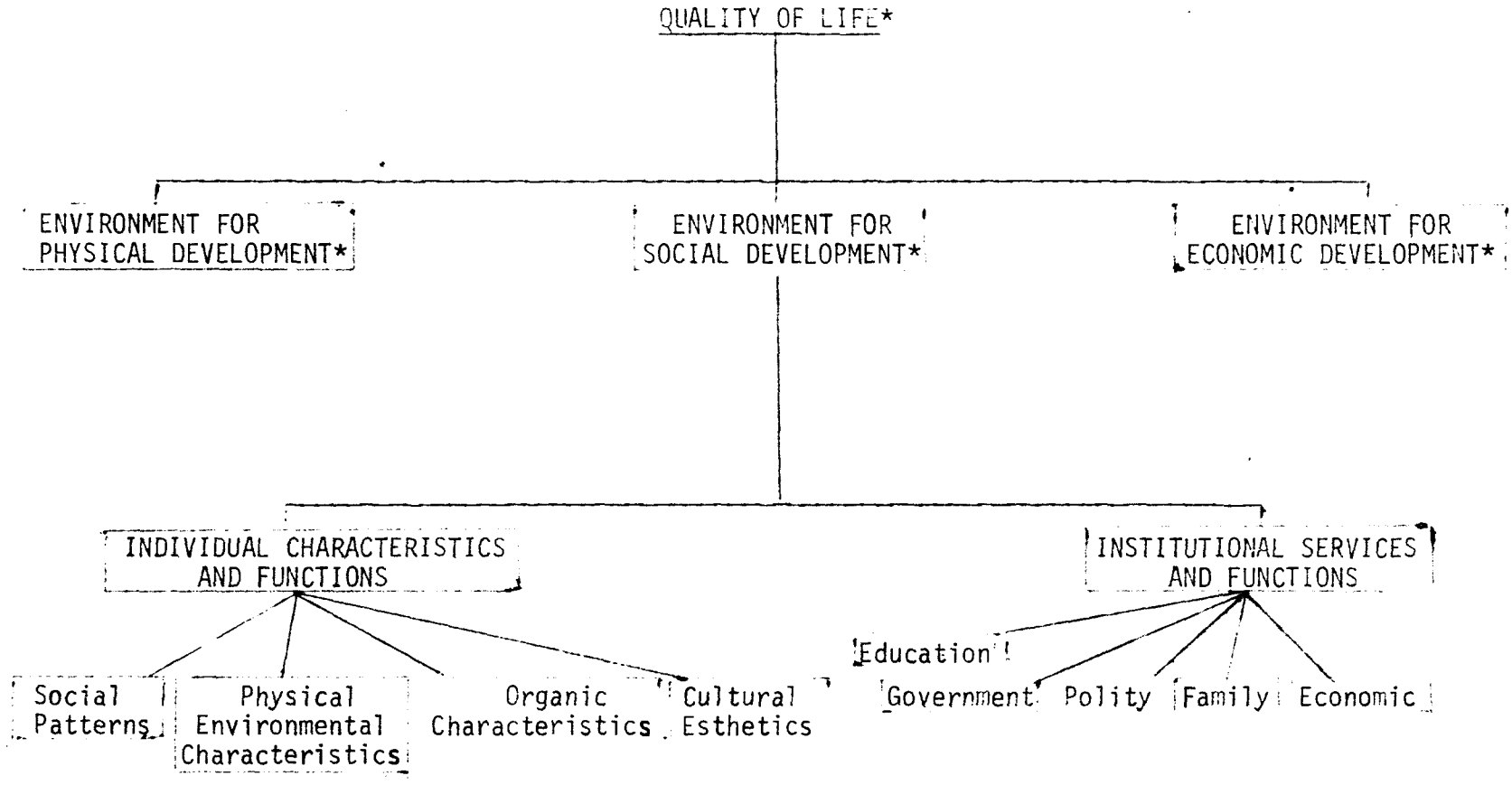
The final step of the model-building effort involved the development of Figures #1 and #2 which depict the position of the institution of education within the "quality of life" hierarchy and the position of the community college within the educational system.

In its final form the total model reflects the "top-down" approach used by Becker and de Brigard (21). Each subsequently lower level acts as the apex for increasingly more restrictive hierarchies. The topmost level of the total model, "quality of life", reflects Gross's (82) "grand abstraction" level. Subsequent levels become less abstract and consequently lend themselves to measurement.

Beginning with Figure #4, the model specifies the input and output variables for each program area and reflects possible relationships between these variables within the single program area. This allows a variety of inputs into any one program area to be evaluated in terms of its impact on the outputs in that same area. The model does not graphically present the fact that variables in one program area may interact with variables from another program area since such a representation would be unduly cumbersome and difficult to understand. It is the intent that such interrelationships between program areas be accomplished by statistical procedures.

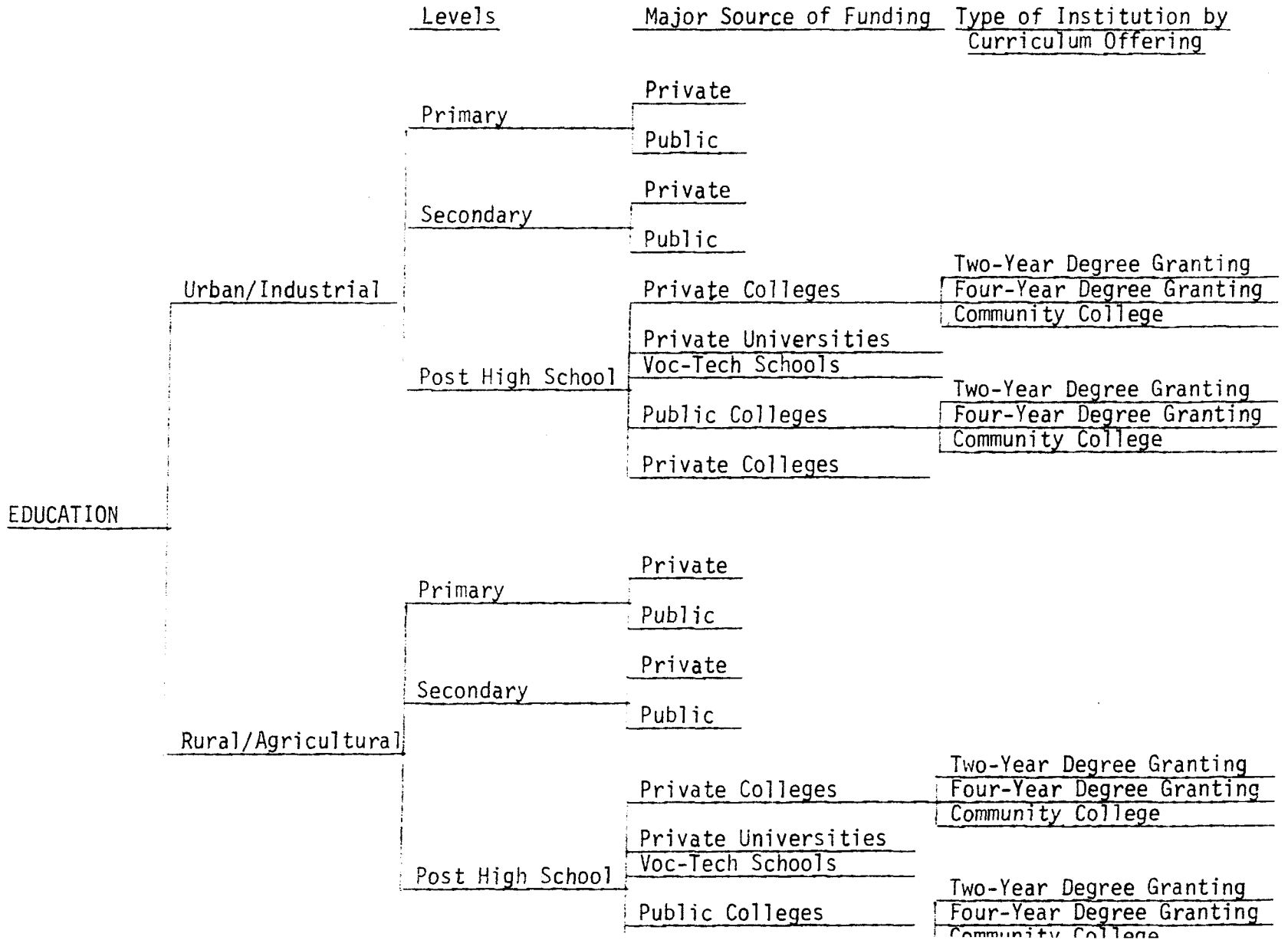
Rationale for the model

Figures #1 and #2 are included in the model in order to clearly show the total rationale behind the evaluation of community college



* From Becker and de Bregard's Taxonomy.

Figure 1: Position of Education in Explication of Quality of Life


Levels
Major Source of Funding
Type of Institution by Curriculum Offering
EDUCATION
Urban/Industrial
Rural/Agricultural
Primary
Secondary
Post High School
Private
Public
Private Colleges
Private Universities
Voc-Tech Schools
Public Colleges
Two-Year Degree Granting
Four-Year Degree Granting
Community College

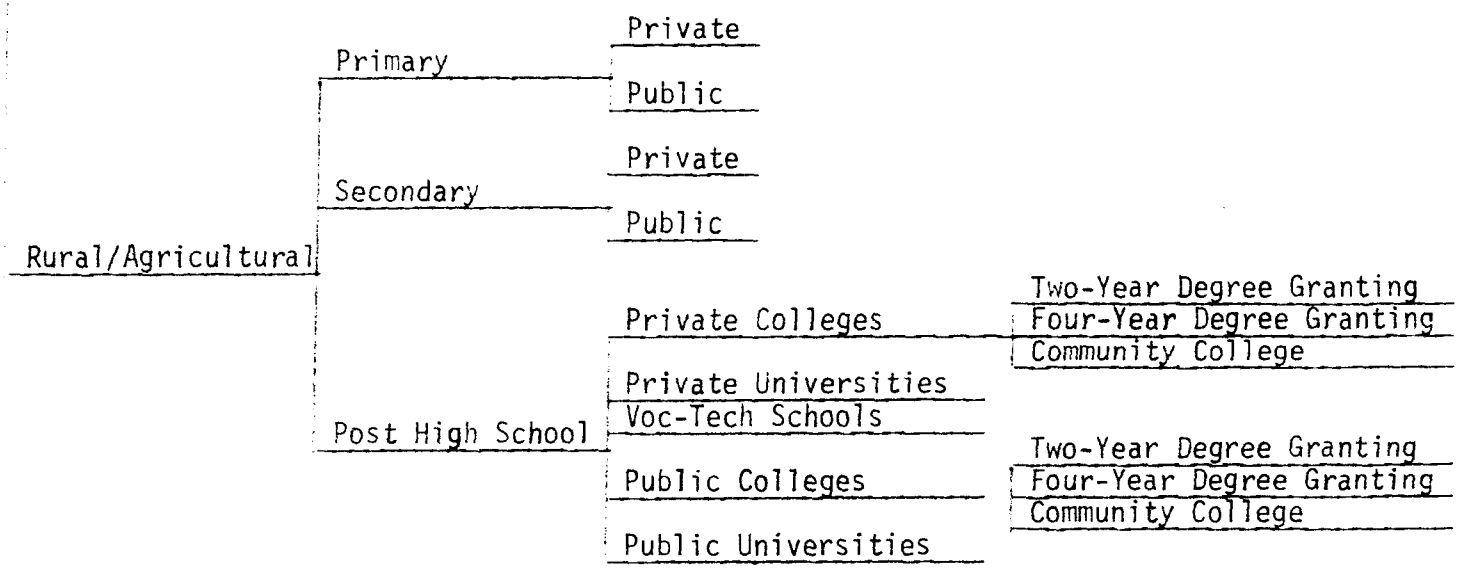


Figure 2: Position of Community College within Educational Institution Schema

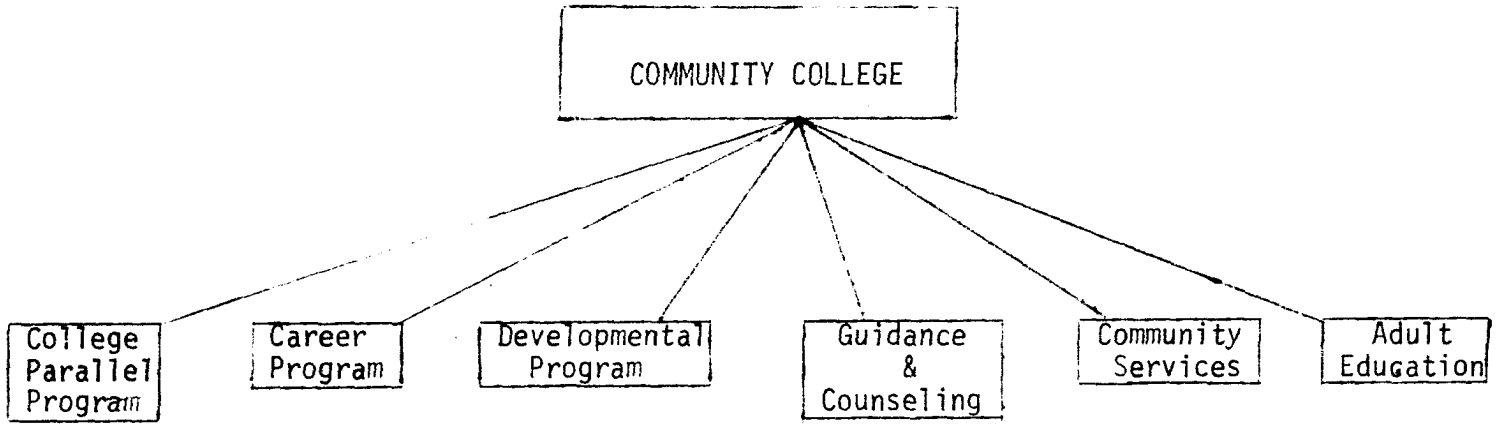
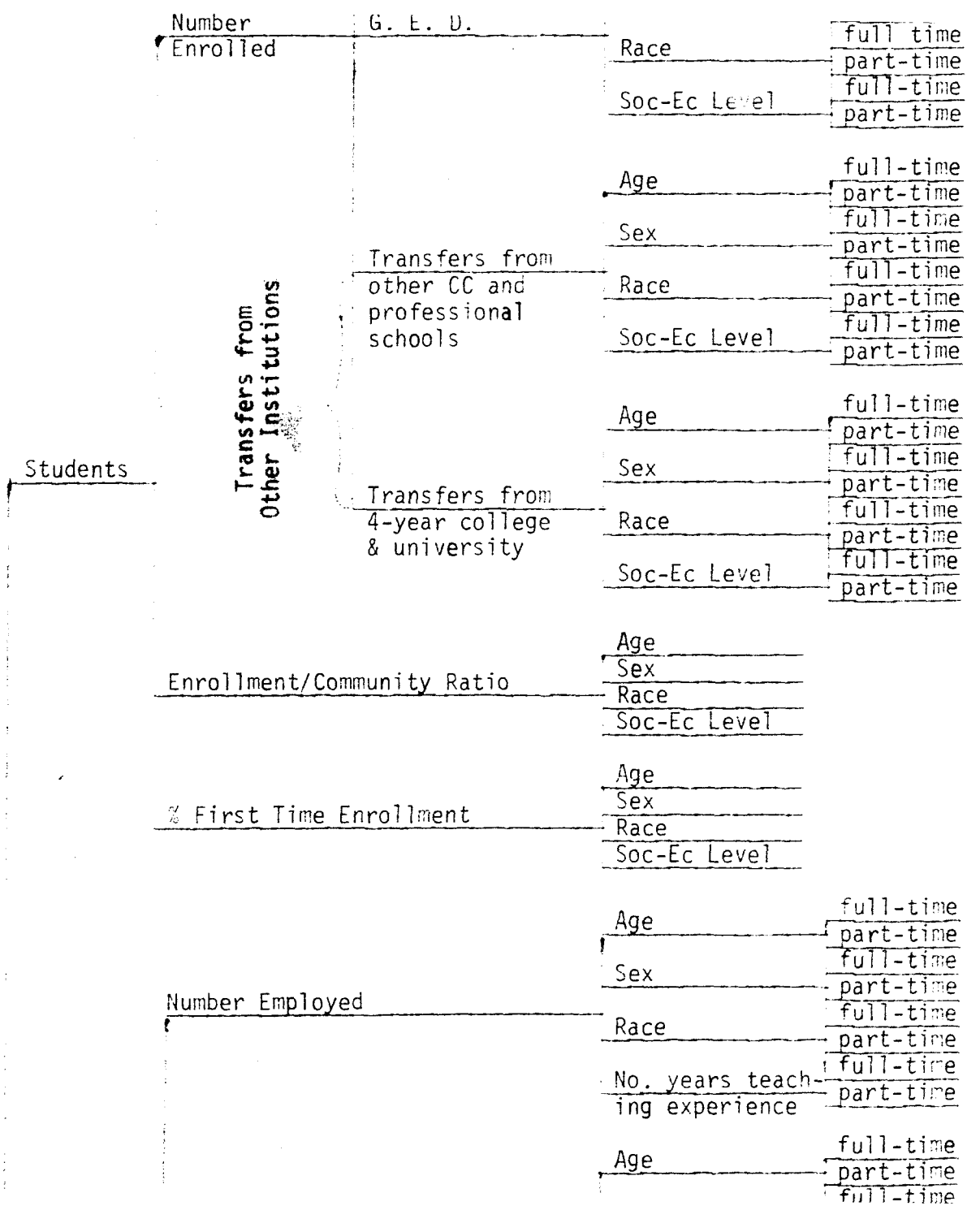
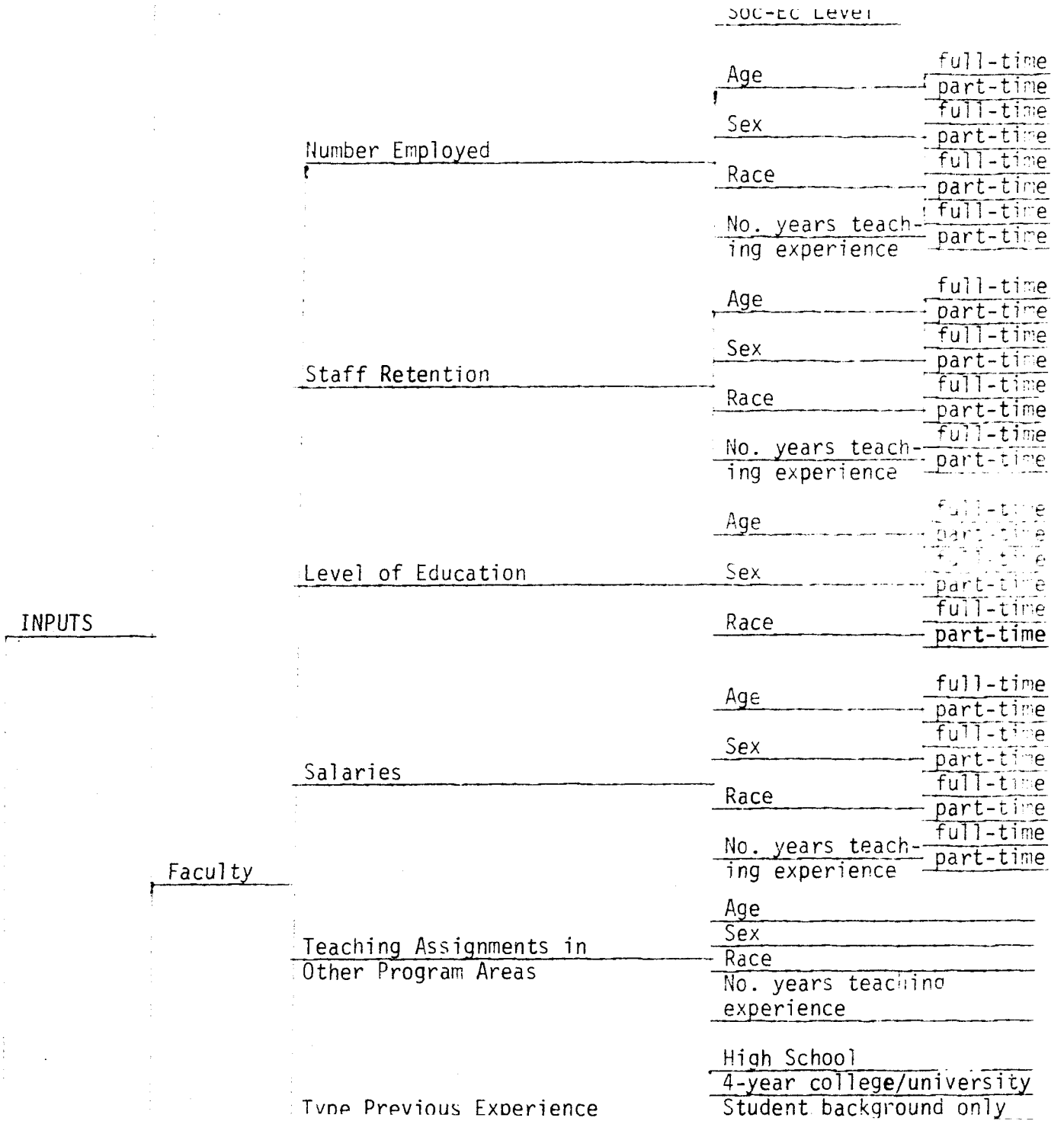
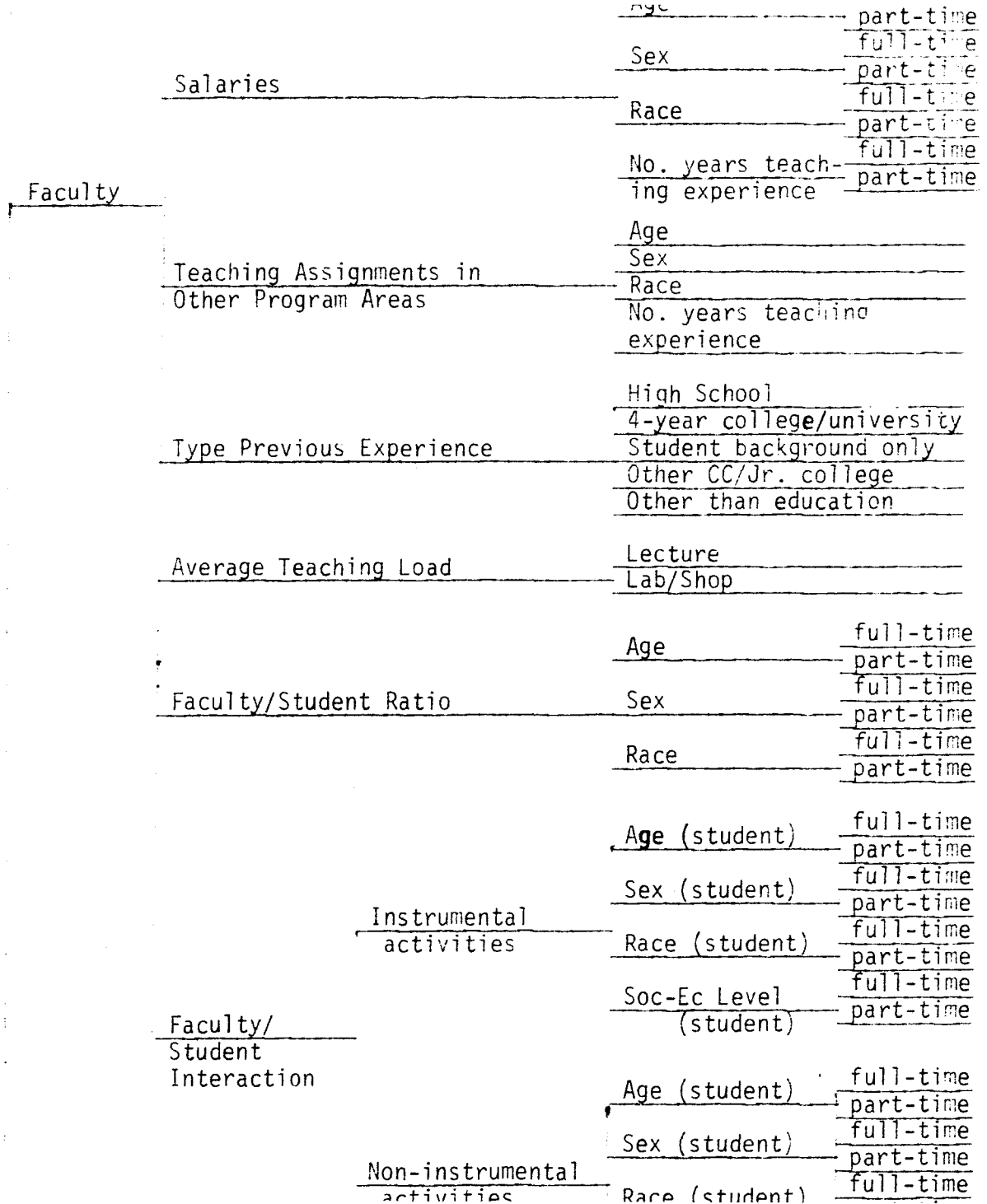


Figure 3: Activities of the Community College (Stated Goals)

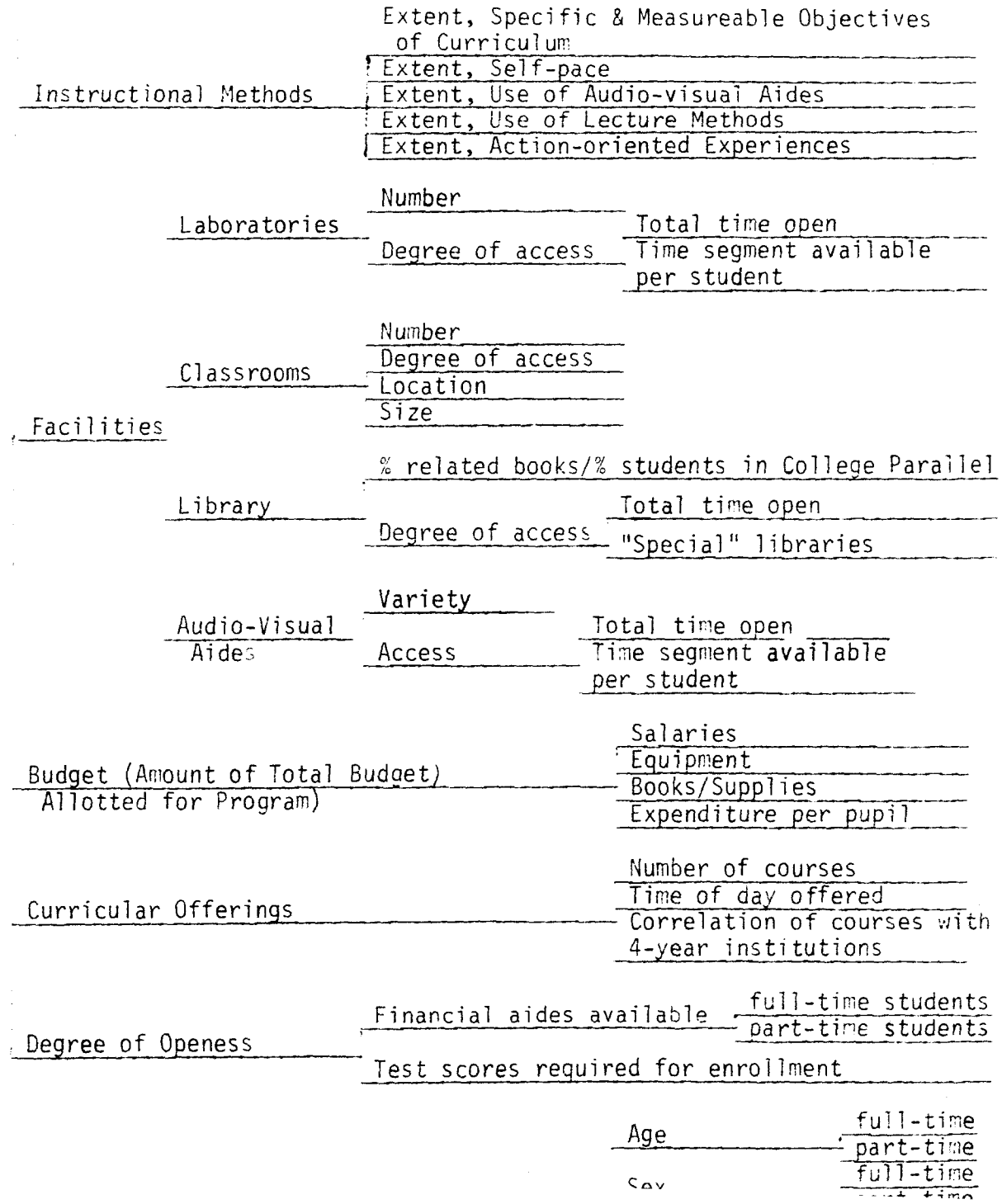
Transfers from Other Programs within Institution
Number Enrolled
H. S. diploma
Transfers from career programs
Transfers from developmental programs
G. E. D.
Age
Sex
Race
Soc-Ec Level
full-time
part-time

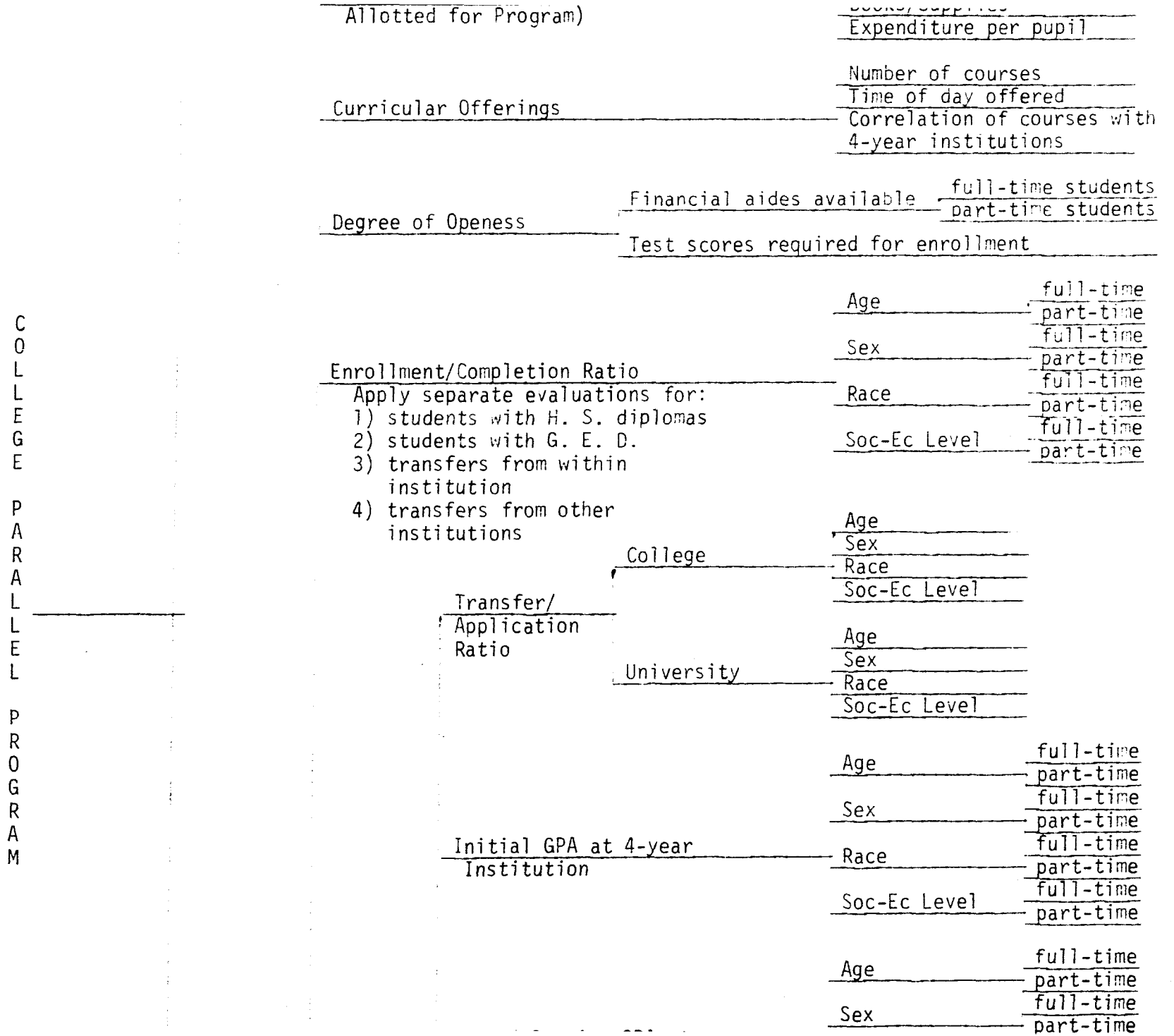

Students
Number Enrolled
G. E. D.
Race
full time
part-time
Soc-Ec Level
full-time
part-time
Transfers from Other Institutions
Transfers from other CC and professional schools
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Transfers from 4-year college & university
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Enrollment/Community Ratio
Age
Sex
Race
Soc-Ec Level
% First Time Enrollment
Age
Sex
Race
Soc-Ec Level
Number Employed
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Age
full-time
part-time
full-time


INPUTS
Faculty
Number Employed
Staff Retention
Level of Education
Salaries
Teaching Assignments in Other Program Areas
Type Previous Experience
Soc-Ec Level
Age
Sex
Race
No. years teaching experience
full-time
part-time
High School
4-year college/university
Student background only


Faculty
Salaries
Age
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Teaching Assignments in Other Program Areas
Age
Sex
Race
No. years teaching experience
Type Previous Experience
High School
4-year college/university
Student background only
Other CC/Jr. college
Other than education
Average Teaching Load
Lecture
Lab/Shop
Faculty/Student Ratio
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Faculty/ Student Interaction
Instrumental activities
Age (student)
full-time
part-time
Sex (student)
full-time
part-time
Race (student)
full-time
part-time
Soc-Ec Level (student)
full-time
part-time
Non-instrumental activities
Age (student)
full-time
part-time
Sex (student)
full-time
part-time
Race (student)
full-time

- Faculty/Student Ratio
  - Sex
    - full-time
    - part-time
  - Race
    - full-time
    - part-time
- Faculty/Student Interaction
  - Instrumental activities
    - Age (student)
      - full-time
      - part-time
    - Sex (student)
      - full-time
      - part-time
    - Race (student)
      - full-time
      - part-time
    - Soc-Ec Level (student)
      - full-time
      - part-time
  - Non-instrumental activities
    - Age (student)
      - full-time
      - part-time
    - Sex (student)
      - full-time
      - part-time
    - Race (student)
      - full-time
      - part-time
    - Soc-Ec Level (student)
      - full-time
      - part-time
- Instructional Methods
  - Extent, Specific & Measureable Objectives of Curriculum
  - Extent, Self-pace
  - Extent, Use of Audio-visual Aides
  - Extent, Use of Lecture Methods
  - Extent, Action-oriented Experiences
- Facilities
  - Laboratories
    - Number
    - Degree of access
      - Total time open
      - Time segment available per student
  - Classrooms
    - Number
    - Degree of access
    - Location
    - Size
  - Library
    - % related books/% students in College Parallel
    - Degree of access
      - Total time open
      - "Special" libraries


Instructional Methods
Extent, Specific & Measureable Objectives of Curriculum
Extent, Self-pace
Extent, Use of Audio-visual Aides
Extent, Use of Lecture Methods
Extent, Action-oriented Experiences
Facilities
Laboratories
Number
Degree of access
Total time open
Time segment available per student
Classrooms
Number
Degree of access
Location
Size
Library
% related books/% students in College Parallel
Degree of access
Total time open
"Special" libraries
Audio-Visual Aides
Variety
Access
Total time open
Time segment available per student
Budget (Amount of Total Budget Allotted for Program)
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Curricular Offerings
Number of courses
Time of day offered
Correlation of courses with 4-year institutions
Degree of Openess
Financial aides available
full-time students
part-time students
Test scores required for enrollment
Age
full-time
part-time
Sex
full-time


COLLEGE PARALLEL PROGRAM
Allotted for Program)
Books/Supplies
Expenditure per pupil
Curricular Offerings
Number of courses
Time of day offered
Correlation of courses with 4-year institutions
Degree of Openess
Financial aides available
full-time students
part-time students
Test scores required for enrollment
Enrollment/Completion Ratio
Apply separate evaluations for:
1) students with H. S. diplomas
2) students with G. E. D.
3) transfers from within institution
4) transfers from other institutions
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Transfer/ Application Ratio
College
Age
Sex
Race
Soc-Ec Level
University
Age
Sex
Race
Soc-Ec Level
Initial GPA at 4-year Institution
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Age
full-time
part-time
Sex
full-time
part-time

PARALLEL PROGRAM

- Transfer/ Application Ratio
  - College
    - Race
    - Soc-Ec Level
  - University
    - Age
    - Sex
    - Race
    - Soc-Ec Level
- Initial GPA at 4-year Institution
  - Age — full-time / part-time
  - Sex — full-time / part-time
  - Race — full-time / part-time
  - Soc-Ec Level — full-time / part-time
- Second Session GPA at 4-year Institution
  - Age — full-time / part-time
  - Sex — full-time / part-time
  - Race — full-time / part-time
  - Soc-Ec Level — full-time / part-time
- Transfer Success

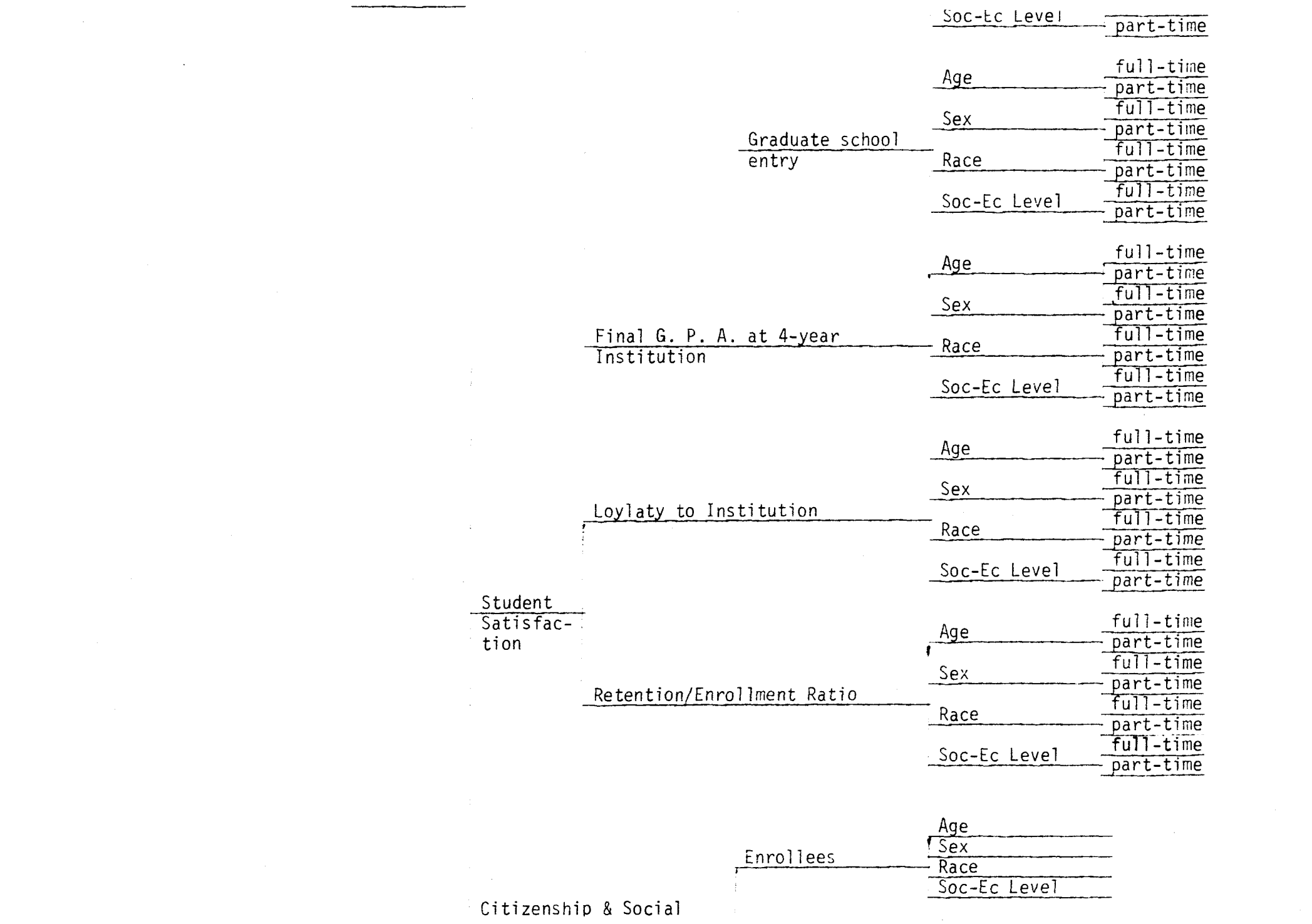
  Apply separate evaluations for:
  1) students with H. S. diploma
  2) students with G.E.D.
  3) transfers from within institutions
  4) transfers from other institutions

  - One Year
    - Age — full-time / part-time
    - Sex — full-time / part-time
    - Race — full-time / part-time
    - Soc-Ec Level — full-time / part-time
  - Two years non-graduate
    - Age — full-time / part-time
    - Sex — full-time / part-time
    - Race — full-time / part-time
    - Soc-Ec Level — full-time / part-time

OUTPUTS

- Transfer Success
  - Apply separate evaluations for:
    1) students with H. S. diploma
    2) students with G.E.D.
    3) transfers from within institutions
    4) transfers from other institutions
  - Length of time at 4-year institutions
    - One Year
      - Soc-Ec Level — full-time / part-time
      - Age — full-time / part-time
      - Sex — full-time / part-time
      - Race — full-time / part-time
      - Soc-Ec Level — full-time / part-time
    - Two years non-graduate
      - Age — full-time / part-time
      - Sex — full-time / part-time
      - Race — full-time / part-time
      - Soc-Ec Level — full-time / part-time
    - Graduation from 4-year institution
      - Age — full-time / part-time
      - Sex — full-time / part-time
      - Race — full-time / part-time
      - Soc-Ec Level — full-time / part-time
    - Graduate school entry
      - Age — full-time / part-time
      - Sex — full-time / part-time
      - Race — full-time / part-time
      - Soc-Ec Level — full-time / part-time
      - Age — full-time / part-time
      - Sex — full-time / part-time
      - full-time

Final G. P. A. at 4 year


Soc-Ec Level
part-time
Age
full-time
part-time
Sex
full-time
part-time
Graduate school entry
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Age
full-time
part-time
Sex
full-time
part-time
Final G. P. A. at 4-year Institution
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Age
full-time
part-time
Sex
full-time
part-time
Loylaty to Institution
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Student Satisfac-tion
Age
full-time
part-time
Sex
full-time
part-time
Retention/Enrollment Ratio
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Age
Sex
Enrollees
Race
Soc-Ec Level
Citizenship & Social

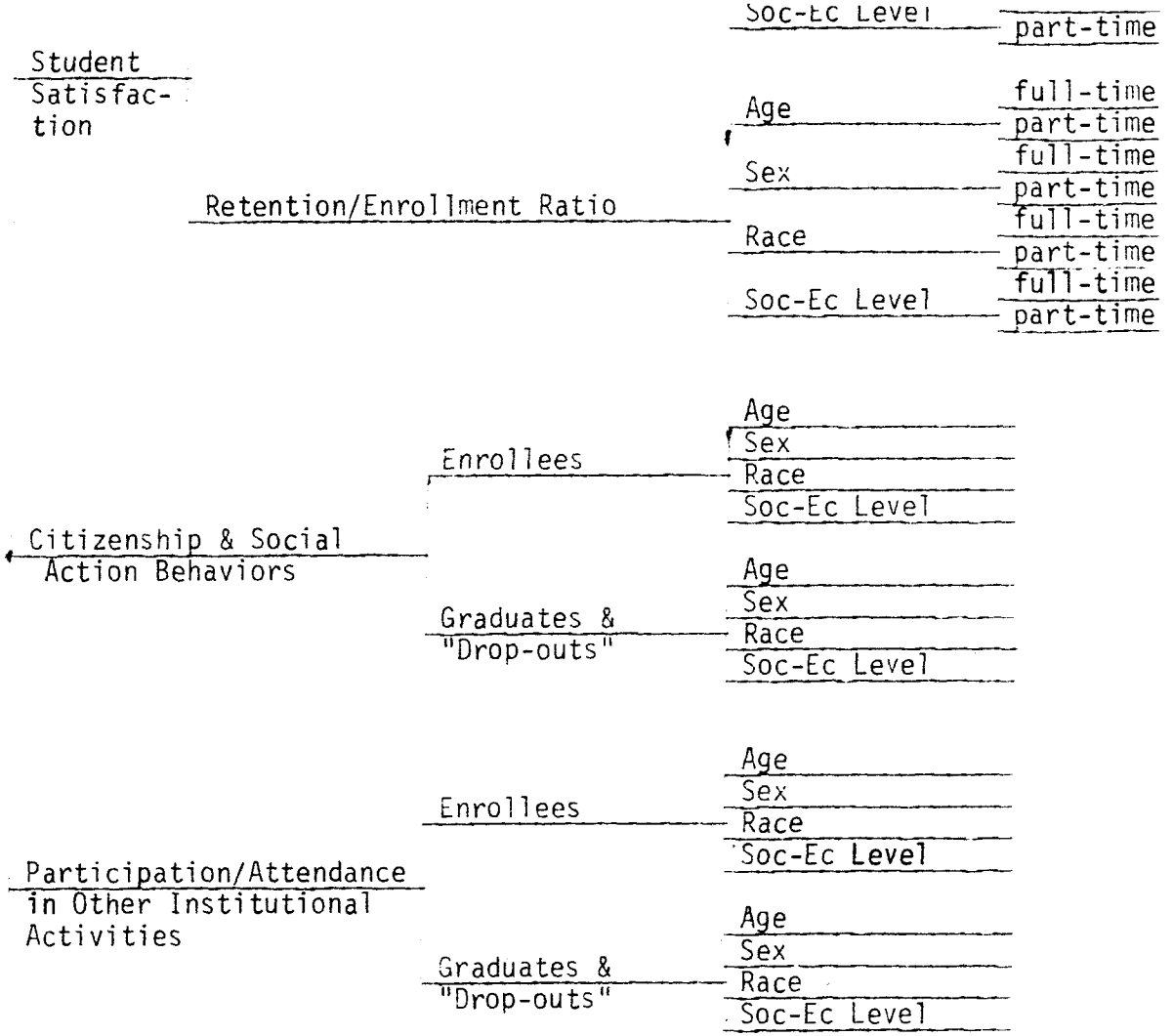
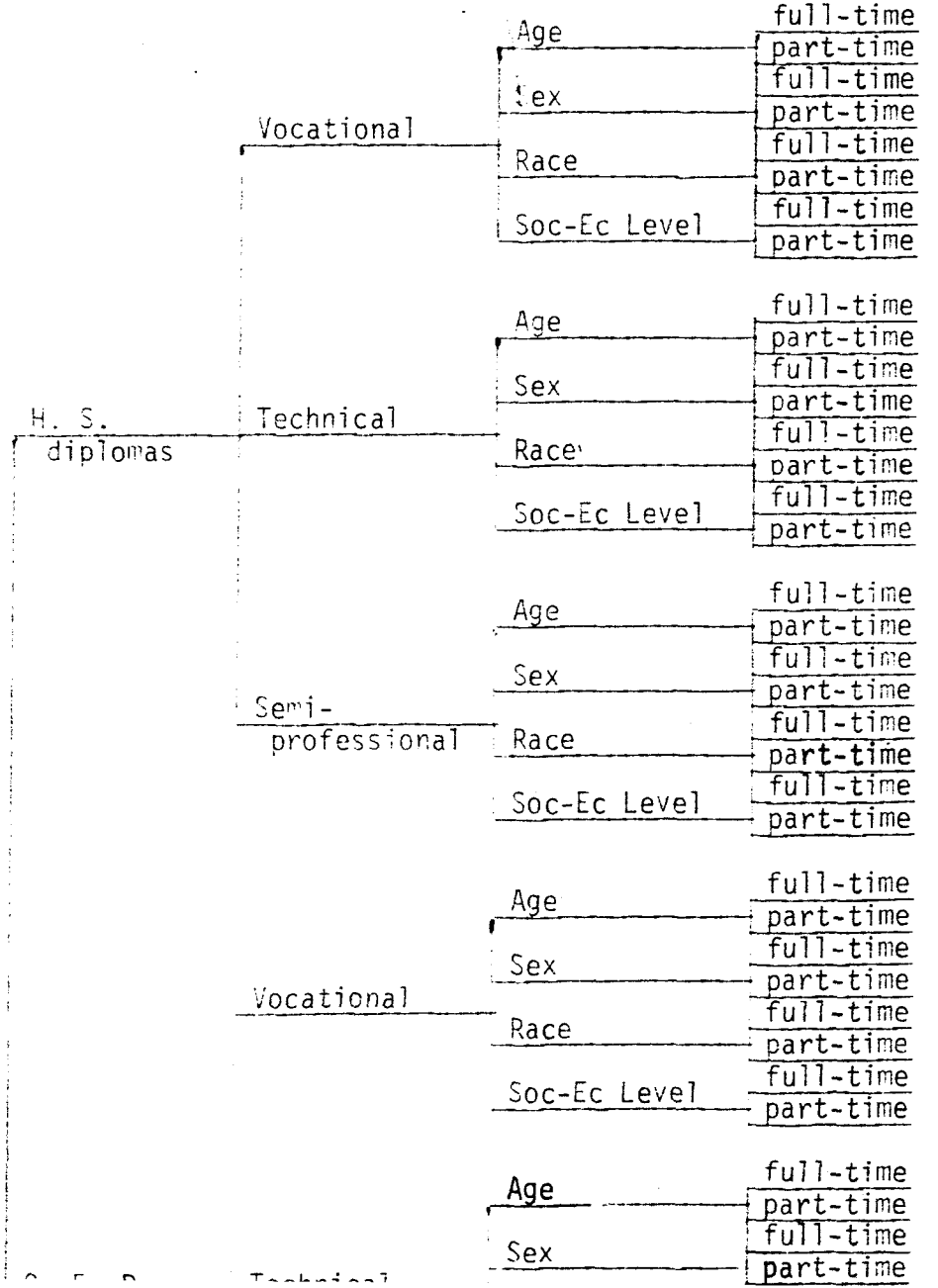
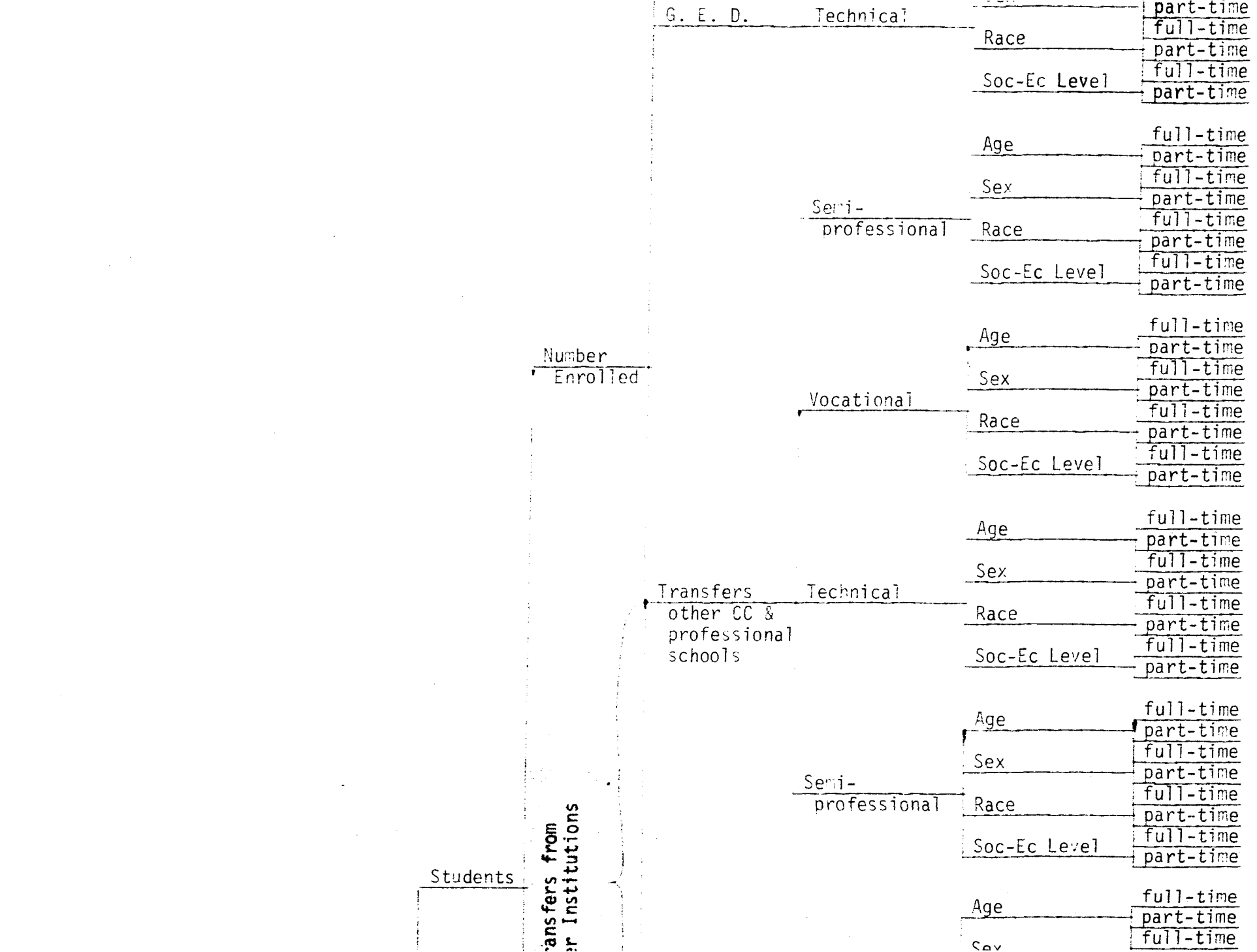
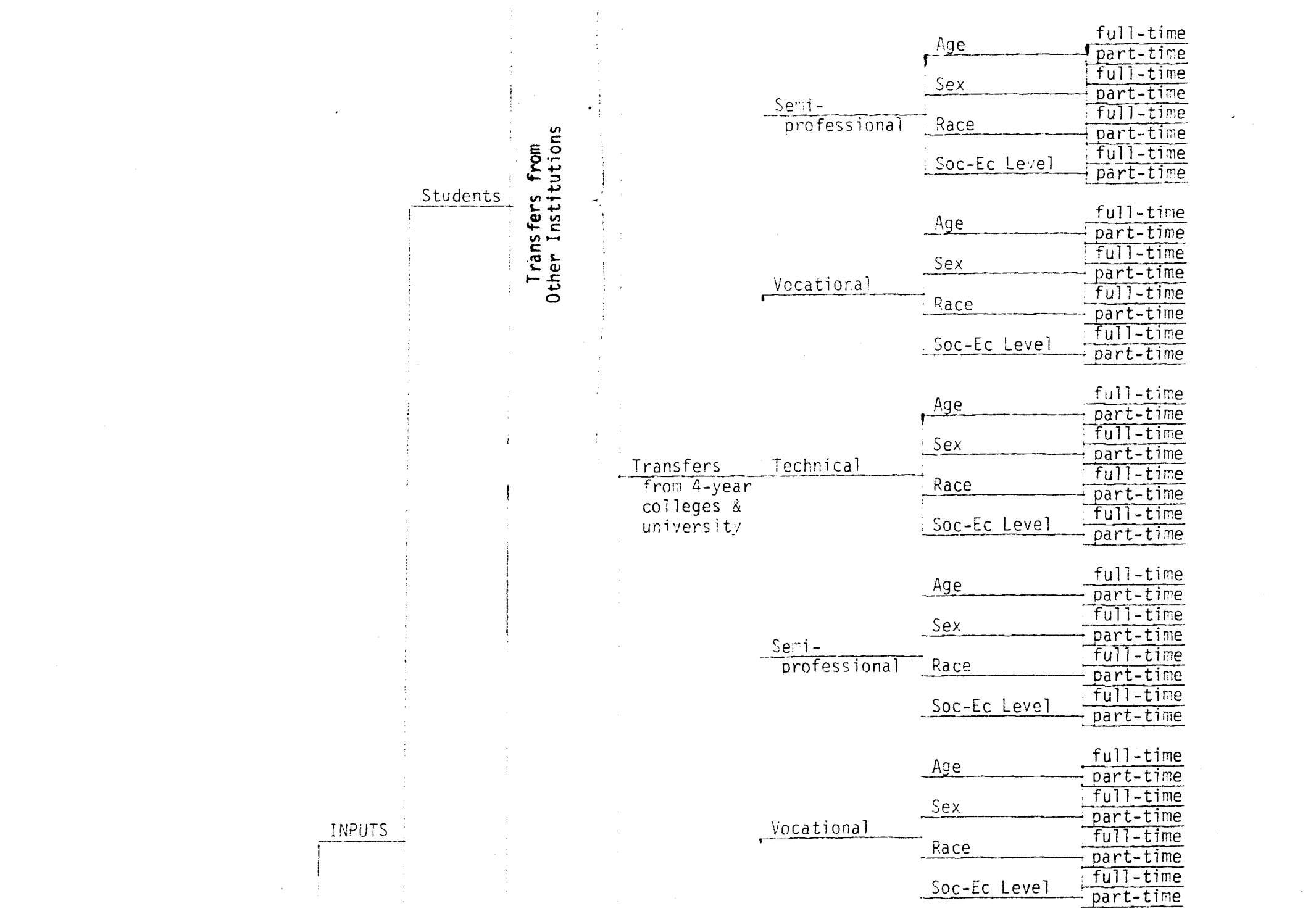


Figure 4: College Parallel Program

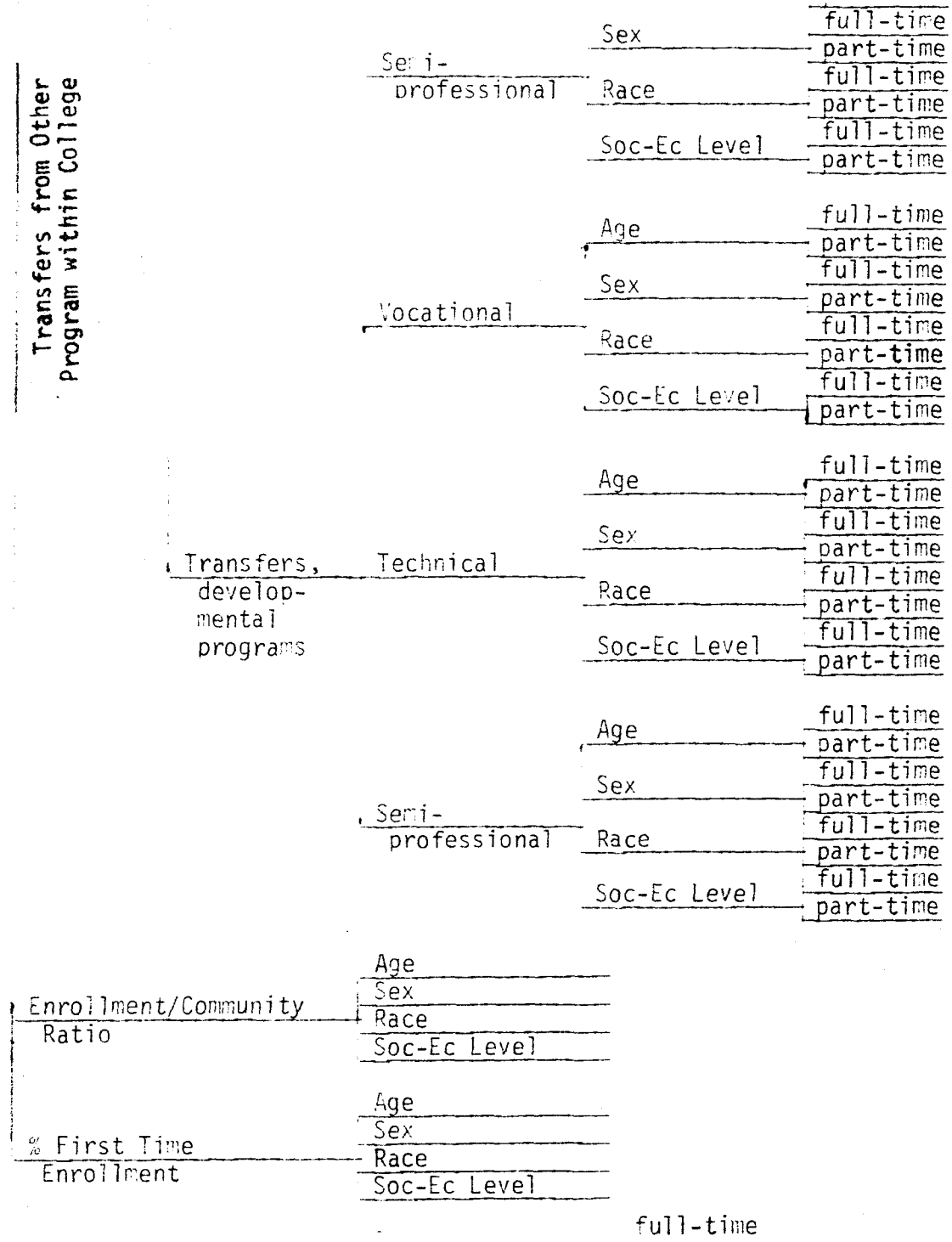

H. S. diplomas
Vocational
Age
Sex
Race
Soc-Ec Level
full-time
part-time
Technical
Semi-professional
Vocational
Technical

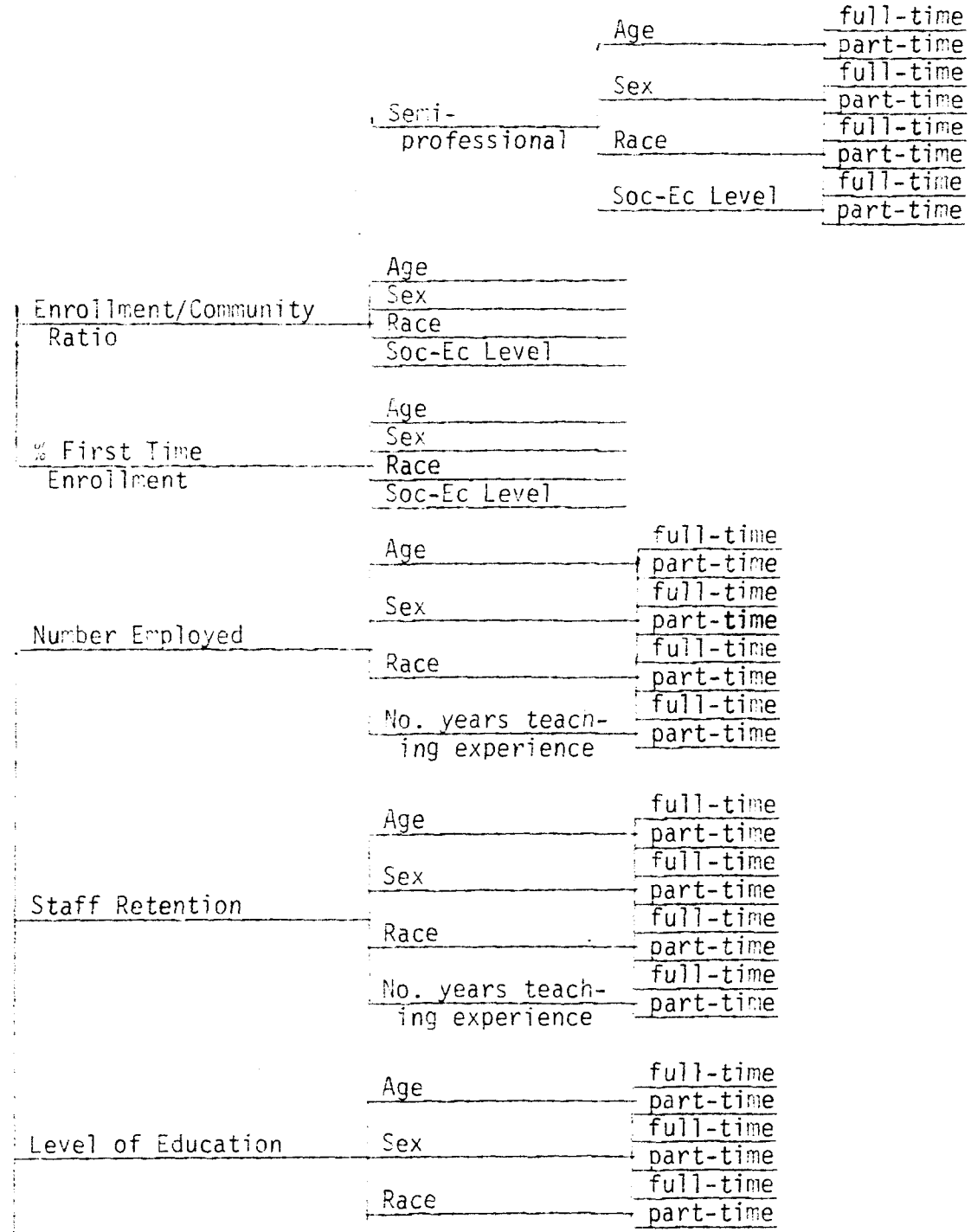

G. E. D.
Technical
Race
Soc-Ec Level
part-time
full-time
part-time
full-time
part-time
Age
Sex
Semi-
professional
Race
Soc-Ec Level
full-time
part-time
full-time
part-time
full-time
part-time
full-time
part-time
Number
Enrolled
Age
Sex
Vocational
Race
Soc-Ec Level
full-time
part-time
full-time
part-time
full-time
part-time
full-time
part-time
Transfers
other CC &
professional
schools
Technical
Age
Sex
Race
Soc-Ec Level
full-time
part-time
full-time
part-time
full-time
part-time
full-time
part-time
Semi-
professional
Age
Sex
Race
Soc-Ec Level
full-time
part-time
full-time
part-time
full-time
part-time
full-time
part-time
Students
ransfers from
r Institutions
Age
Sex
full-time
part-time
full-time

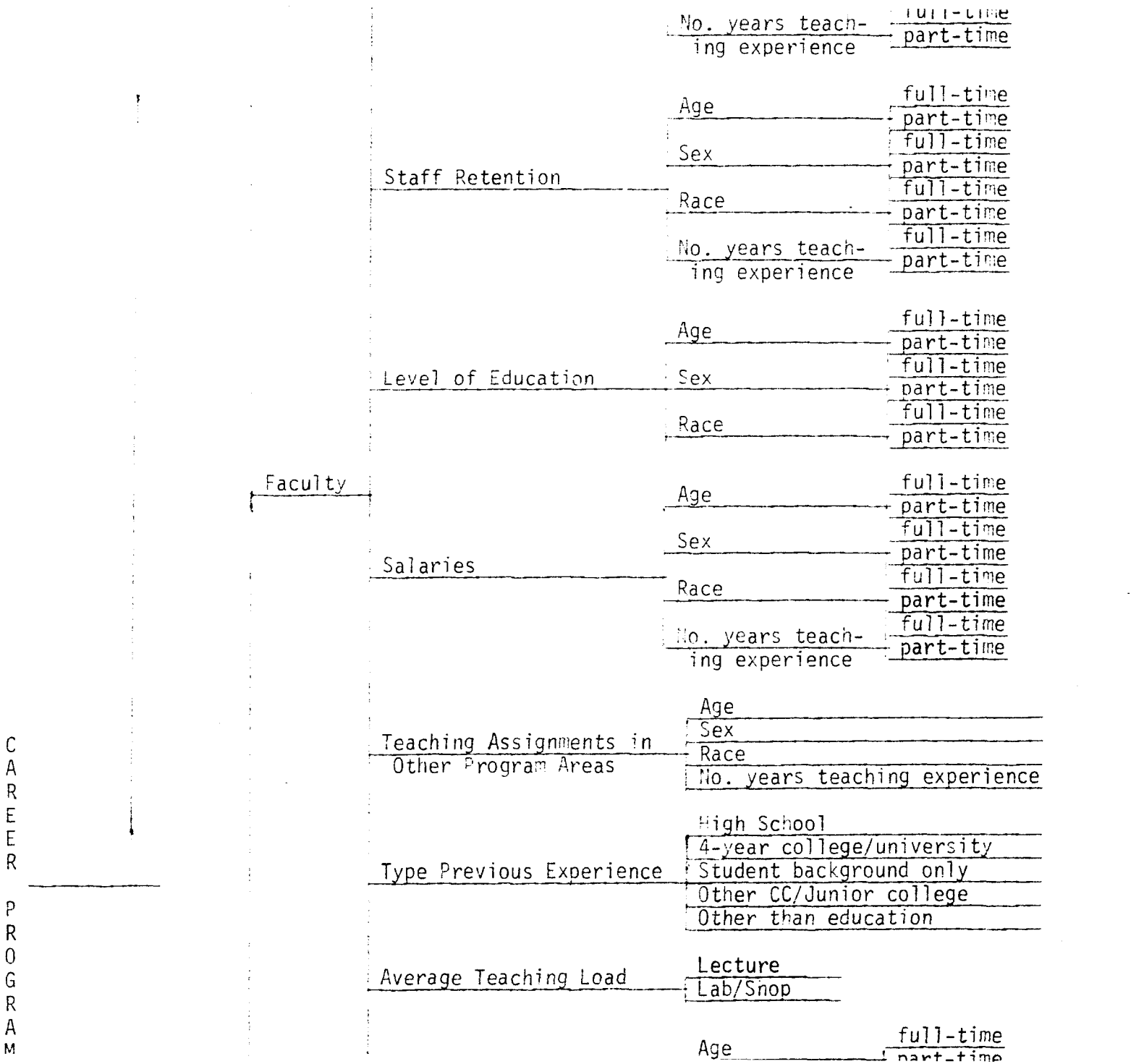

INPUTS
Students
Transfers from Other Institutions
Transfers from 4-year colleges & university
Technical
Semi-professional
Vocational
Technical
Semi-professional
Vocational
Age
Sex
Race
Soc-Ec Level
full-time
part-time

INPUTS

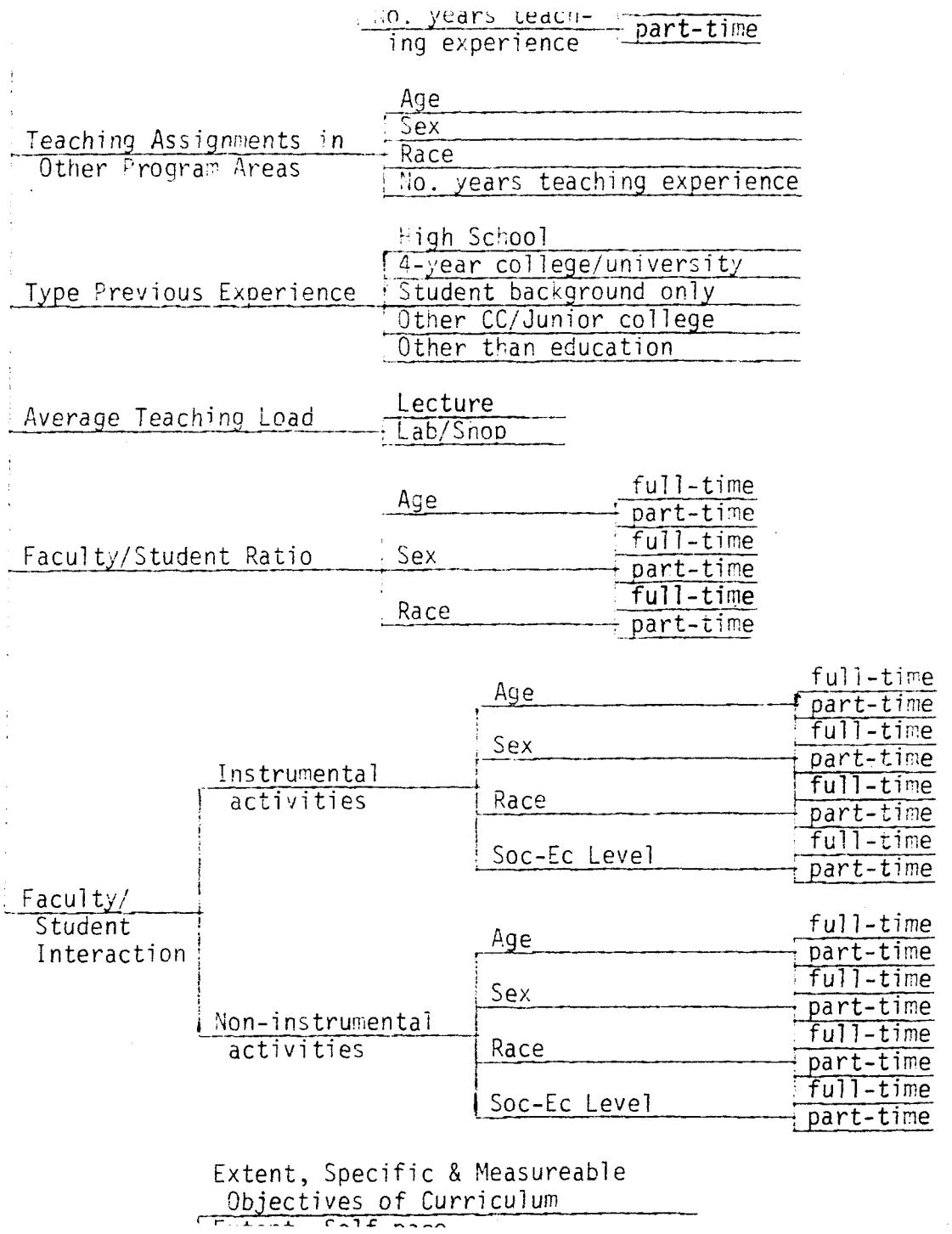
- Transfers, college parallel program
  - Technical
    - Age: full-time / part-time
    - Sex: full-time / part-time
    - Race: full-time / part-time
    - Soc-Ec Level: full-time / part-time
  - Semi-professional
    - Sex: part-time
    - Race: full-time / part-time
    - Soc-Ec Level: full-time / part-time
  - Vocational
    - Age: full-time / part-time
    - Sex: full-time / part-time
    - Race: full-time / part-time
    - Soc-Ec Level: full-time / part-time
- Transfers from Other Program within College
  - Semi-professional
    - Age: full-time / part-time
    - Sex: full-time / part-time
    - Race: full-time / part-time
    - Soc-Ec Level: full-time / part-time
  - Vocational
    - Age: full-time / part-time
    - Sex: full-time / part-time
    - Race: full-time / part-time
    - Soc-Ec Level: full-time / part-time
  - Age: full-time / part-time / full-time

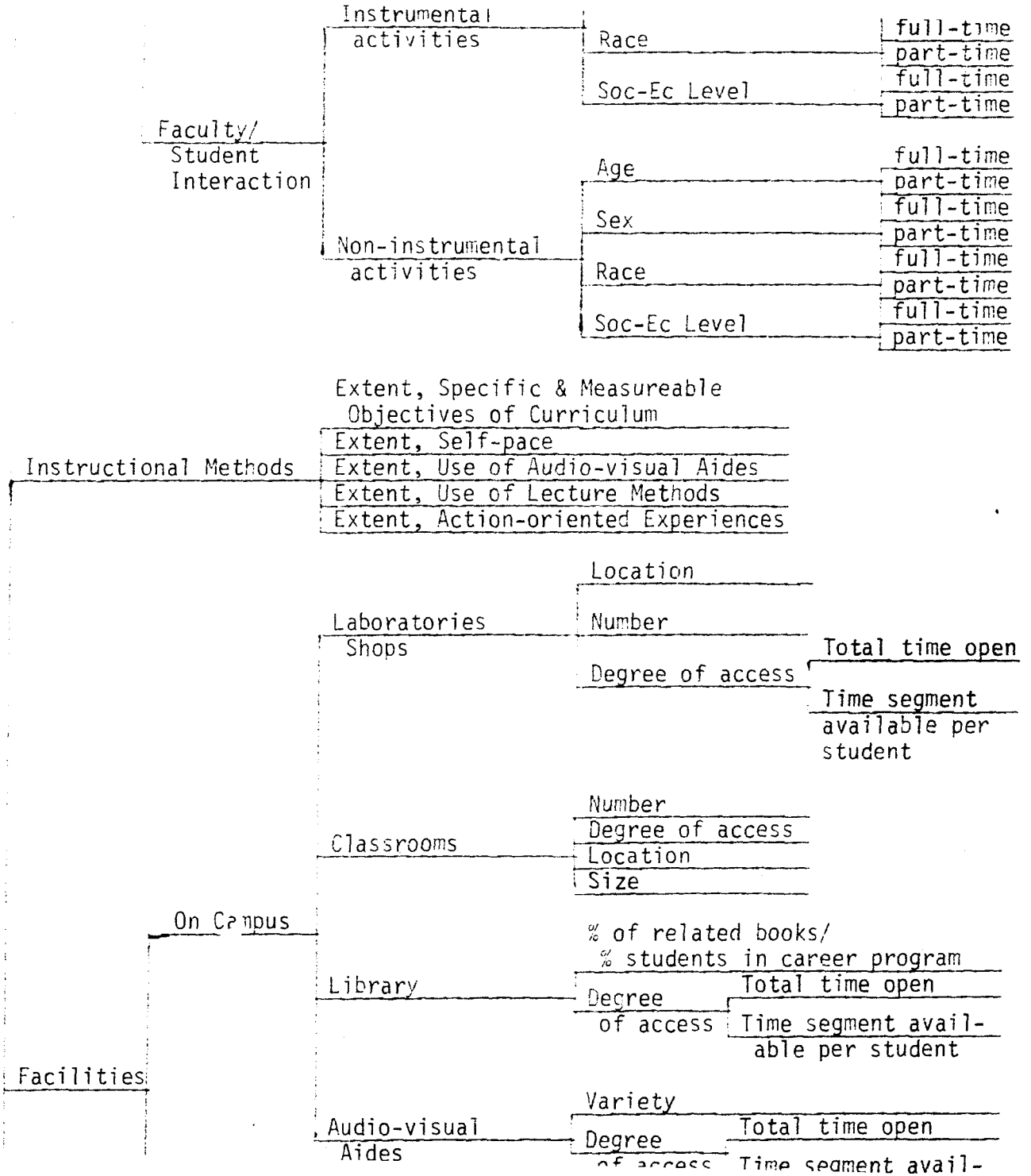

Transfers from Other Program within College
Semi-professional
Sex
Race
Soc-Ec Level
full-time
part-time
Vocational
Age
Sex
Race
Soc-Ec Level
Transfers, developmental programs
Technical
Semi-professional
Enrollment/Community Ratio
% First Time Enrollment

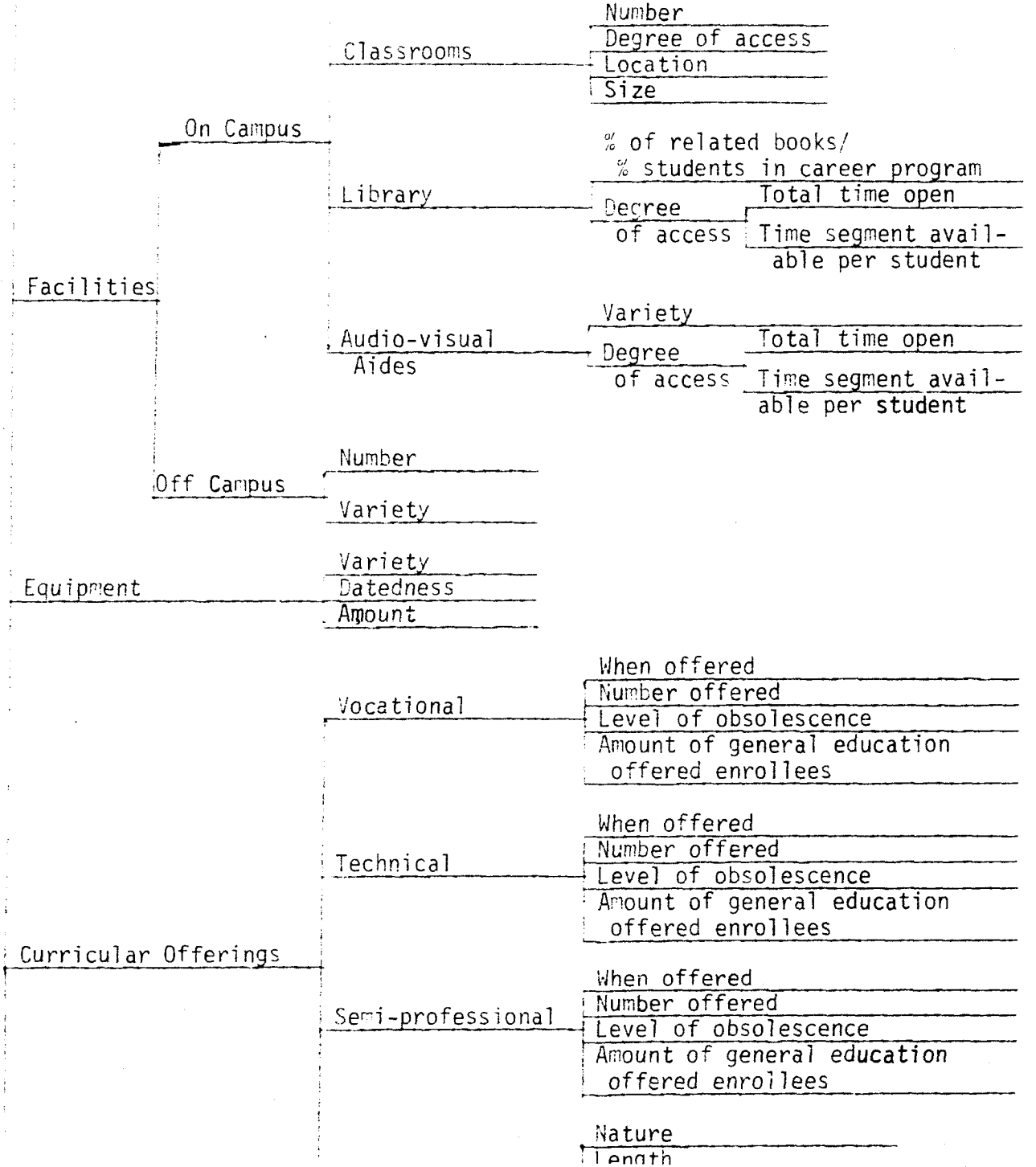

Semi-professional
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Enrollment/Community Ratio
Age
Sex
Race
Soc-Ec Level
% First Time Enrollment
Age
Sex
Race
Soc-Ec Level
Number Employed
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Staff Retention
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Level of Education
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time

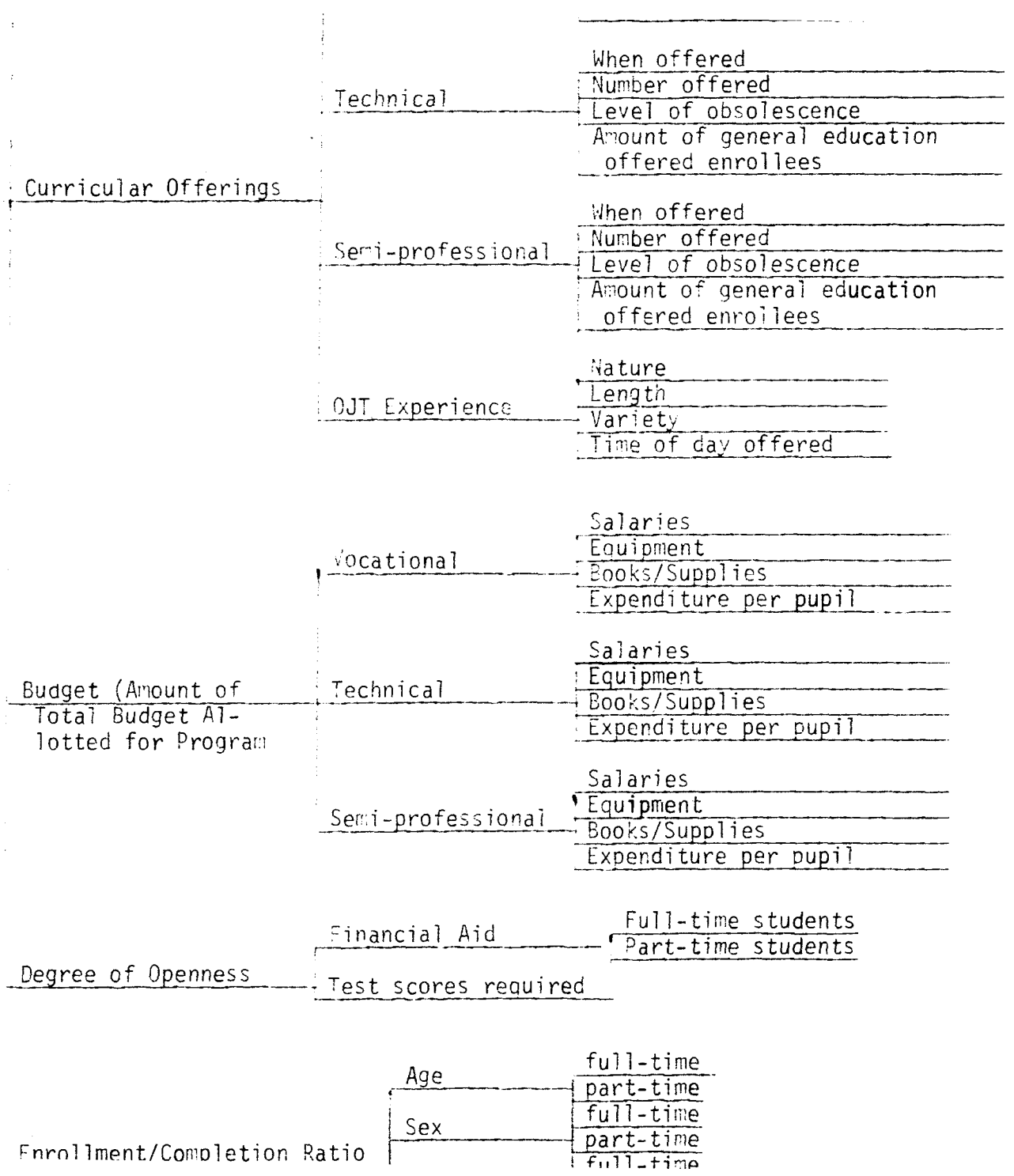

CAREER PROGRAM
Faculty
Staff Retention
No. years teaching experience
full-time
part-time
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Level of Education
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Salaries
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Teaching Assignments in Other Program Areas
Age
Sex
Race
No. years teaching experience
Type Previous Experience
High School
4-year college/university
Student background only
Other CC/Junior college
Other than education
Average Teaching Load
Lecture
Lab/Snop
Age
full-time
part-time

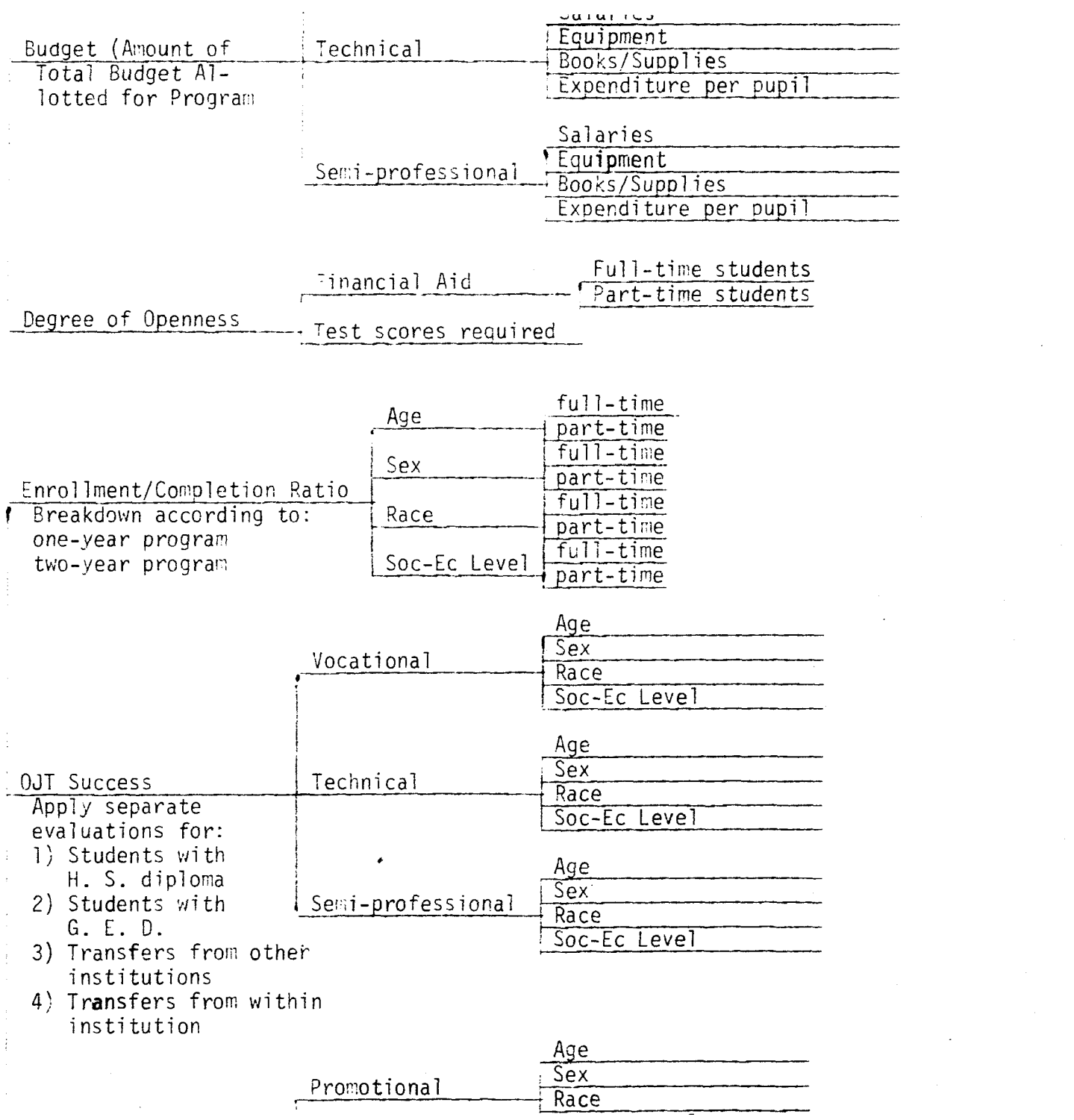
CAREER PROGRAMS

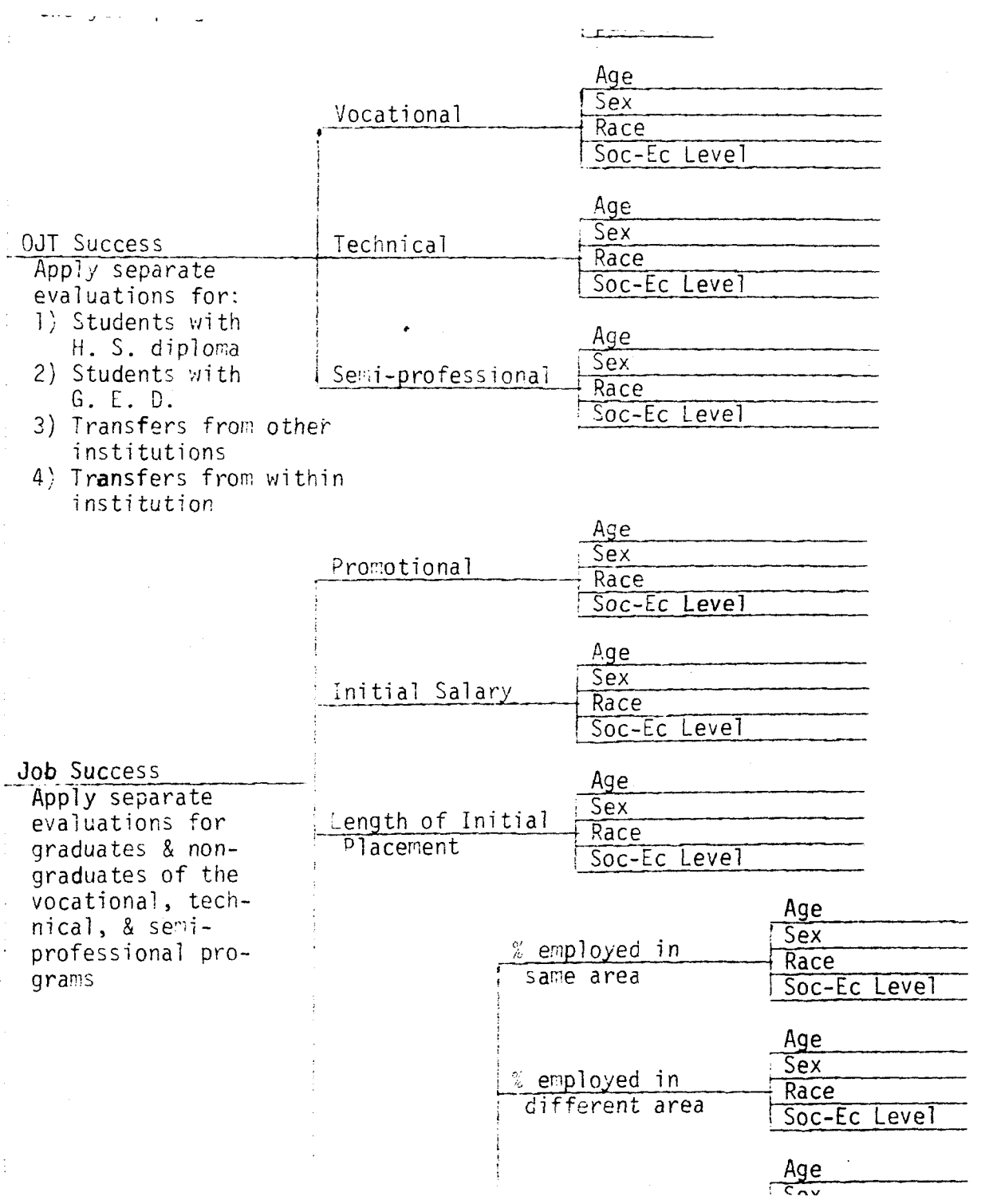


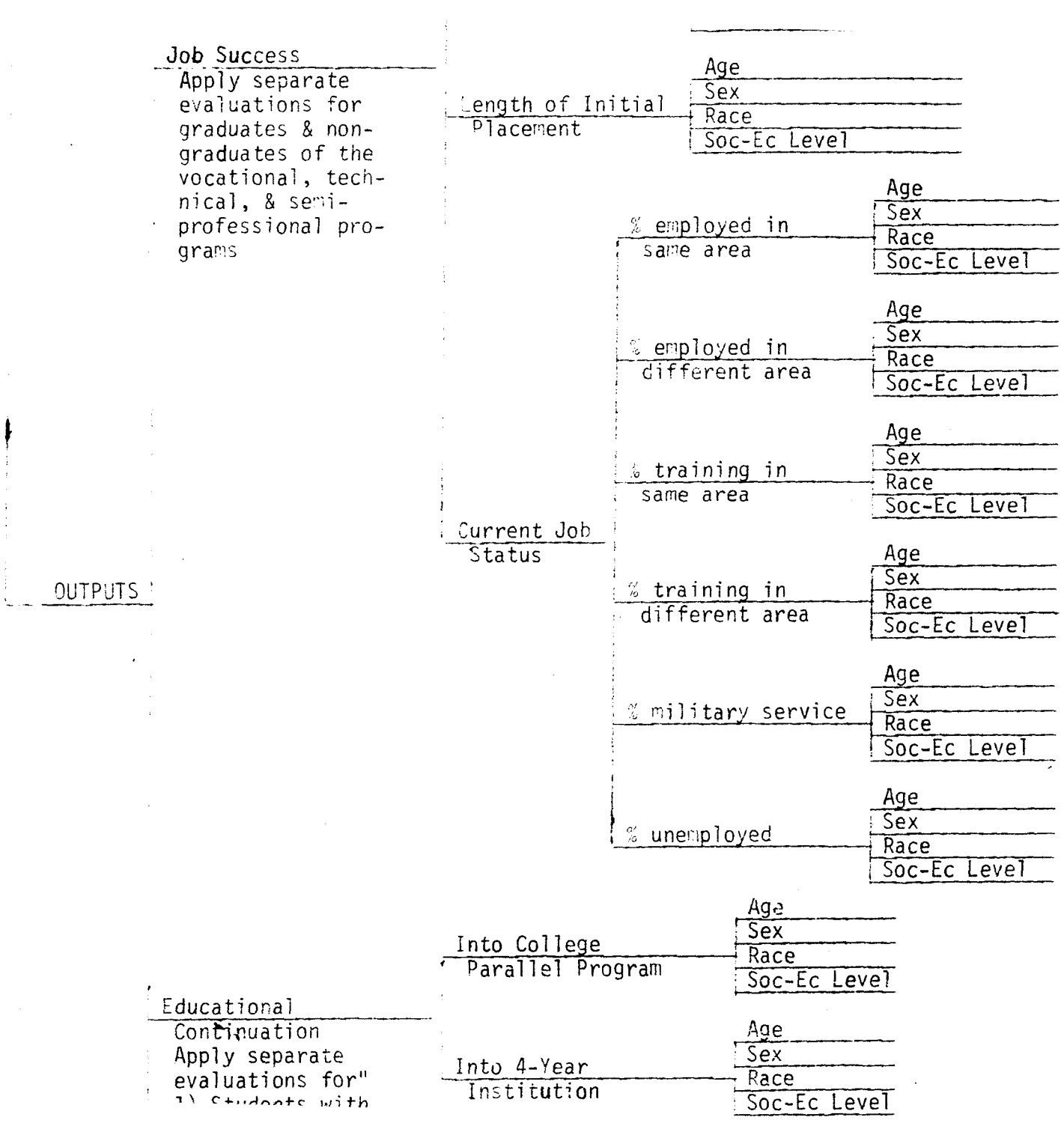

Faculty/ Student Interaction
Instrumental activities
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Non-instrumental activities
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
Instructional Methods
Extent, Specific & Measureable Objectives of Curriculum
Extent, Self-pace
Extent, Use of Audio-visual Aides
Extent, Use of Lecture Methods
Extent, Action-oriented Experiences
Facilities
On Campus
Laboratories Shops
Location
Number
Degree of access
Total time open
Time segment available per student
Classrooms
Number
Degree of access
Location
Size
Library
% of related books/ % students in career program
Degree of access
Total time open
Time segment available per student
Audio-visual Aides
Variety
Degree of access
Total time open
Time segment avail-

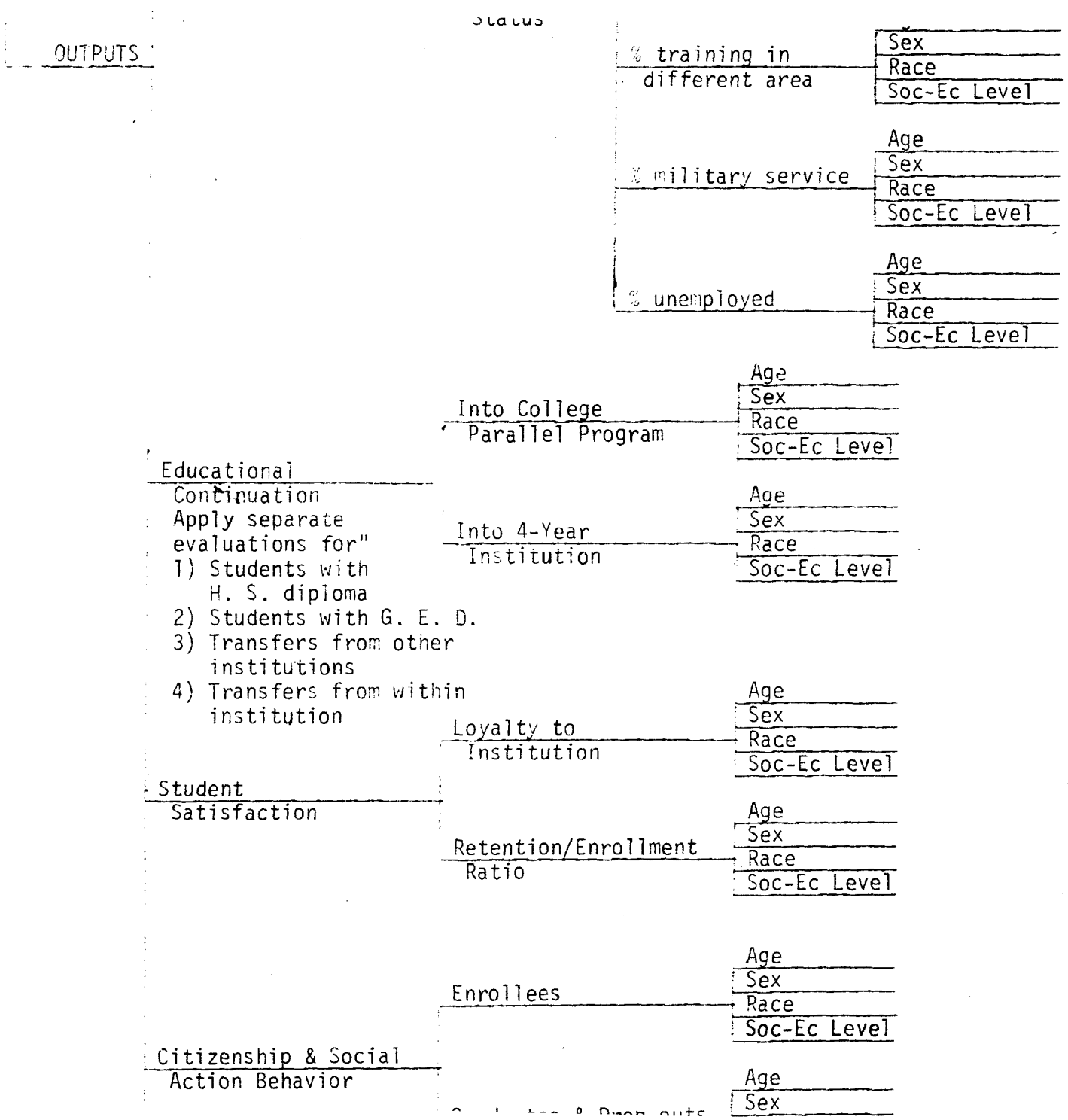

Facilities
On Campus
Classrooms
Number
Degree of access
Location
Size
Library
% of related books/
% students in career program
Degree of access
Total time open
Time segment available per student
Audio-visual Aides
Variety
Degree of access
Total time open
Time segment available per student
Off Campus
Number
Variety
Equipment
Variety
Datedness
Amount
Curricular Offerings
Vocational
When offered
Number offered
Level of obsolescence
Amount of general education offered enrollees
Technical
When offered
Number offered
Level of obsolescence
Amount of general education offered enrollees
Semi-professional
When offered
Number offered
Level of obsolescence
Amount of general education offered enrollees
Nature
Length


Curricular Offerings
Technical
When offered
Number offered
Level of obsolescence
Amount of general education offered enrollees
Semi-professional
When offered
Number offered
Level of obsolescence
Amount of general education offered enrollees
OJT Experience
Nature
Length
Variety
Time of day offered
Budget (Amount of Total Budget Allotted for Program
Vocational
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Technical
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Semi-professional
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Degree of Openness
Financial Aid
Full-time students
Part-time students
Test scores required
Enrollment/Completion Ratio
Age
full-time
part-time
Sex
full-time
part-time
full-time


Budget (Amount of Total Budget Allotted for Program
Technical
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Semi-professional
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Degree of Openness
Financial Aid
Full-time students
Part-time students
Test scores required
Enrollment/Completion Ratio
Breakdown according to:
one-year program
two-year program
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Soc-Ec Level
full-time
part-time
OJT Success
Apply separate evaluations for:
1) Students with H. S. diploma
2) Students with G. E. D.
3) Transfers from other institutions
4) Transfers from within institution
Vocational
Age
Sex
Race
Soc-Ec Level
Technical
Age
Sex
Race
Soc-Ec Level
Semi-professional
Age
Sex
Race
Soc-Ec Level
Promotional
Age
Sex
Race


OJT Success
Apply separate evaluations for:
1) Students with H. S. diploma
2) Students with G. E. D.
3) Transfers from other institutions
4) Transfers from within institution
Vocational
Technical
Semi-professional
Age
Sex
Race
Soc-Ec Level
Job Success
Apply separate evaluations for graduates & non-graduates of the vocational, technical, & semi-professional programs
Promotional
Initial Salary
Length of Initial Placement
% employed in same area
% employed in different area
Age
Sex
Race
Soc-Ec Level


OUTPUTS
Job Success
Apply separate evaluations for graduates & non-graduates of the vocational, technical, & semi-professional programs
Length of Initial Placement
Age
Sex
Race
Soc-Ec Level
Current Job Status
% employed in same area
% employed in different area
% training in same area
% training in different area
% military service
% unemployed
Educational Continuation
Apply separate evaluations for"
Into College Parallel Program
Into 4-Year Institution


Status
OUTPUTS
% training in different area
Sex
Race
Soc-Ec Level
% military service
Age
Sex
Race
Soc-Ec Level
% unemployed
Age
Sex
Race
Soc-Ec Level
Educational Continuation
Apply separate evaluations for"
1) Students with H. S. diploma
2) Students with G. E. D.
3) Transfers from other institutions
4) Transfers from within institution
Into College Parallel Program
Age
Sex
Race
Soc-Ec Level
Into 4-Year Institution
Age
Sex
Race
Soc-Ec Level
Loyalty to Institution
Age
Sex
Race
Soc-Ec Level
Student Satisfaction
Retention/Enrollment Ratio
Age
Sex
Race
Soc-Ec Level
Enrollees
Age
Sex
Race
Soc-Ec Level
Citizenship & Social Action Behavior
Age
Sex

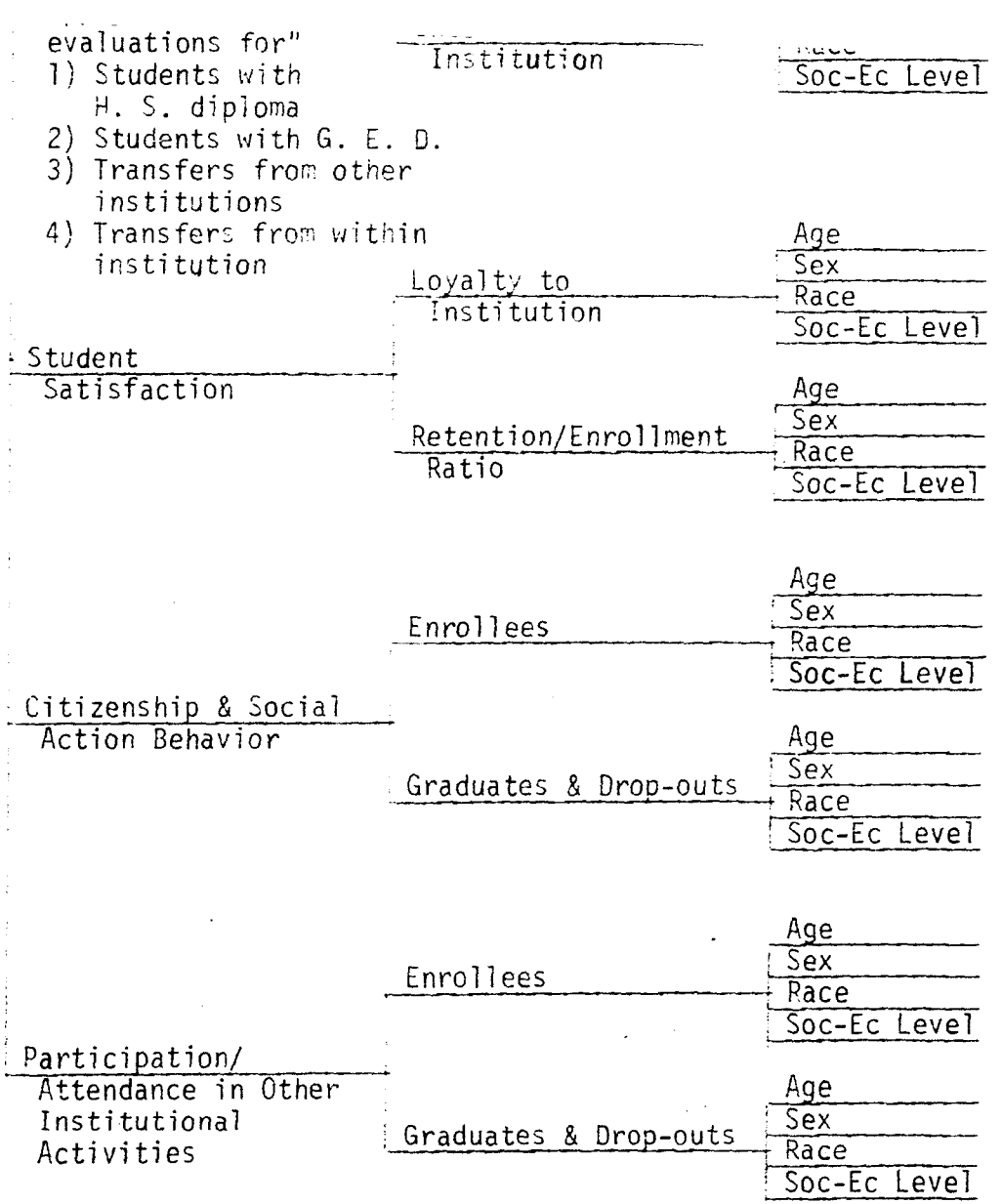
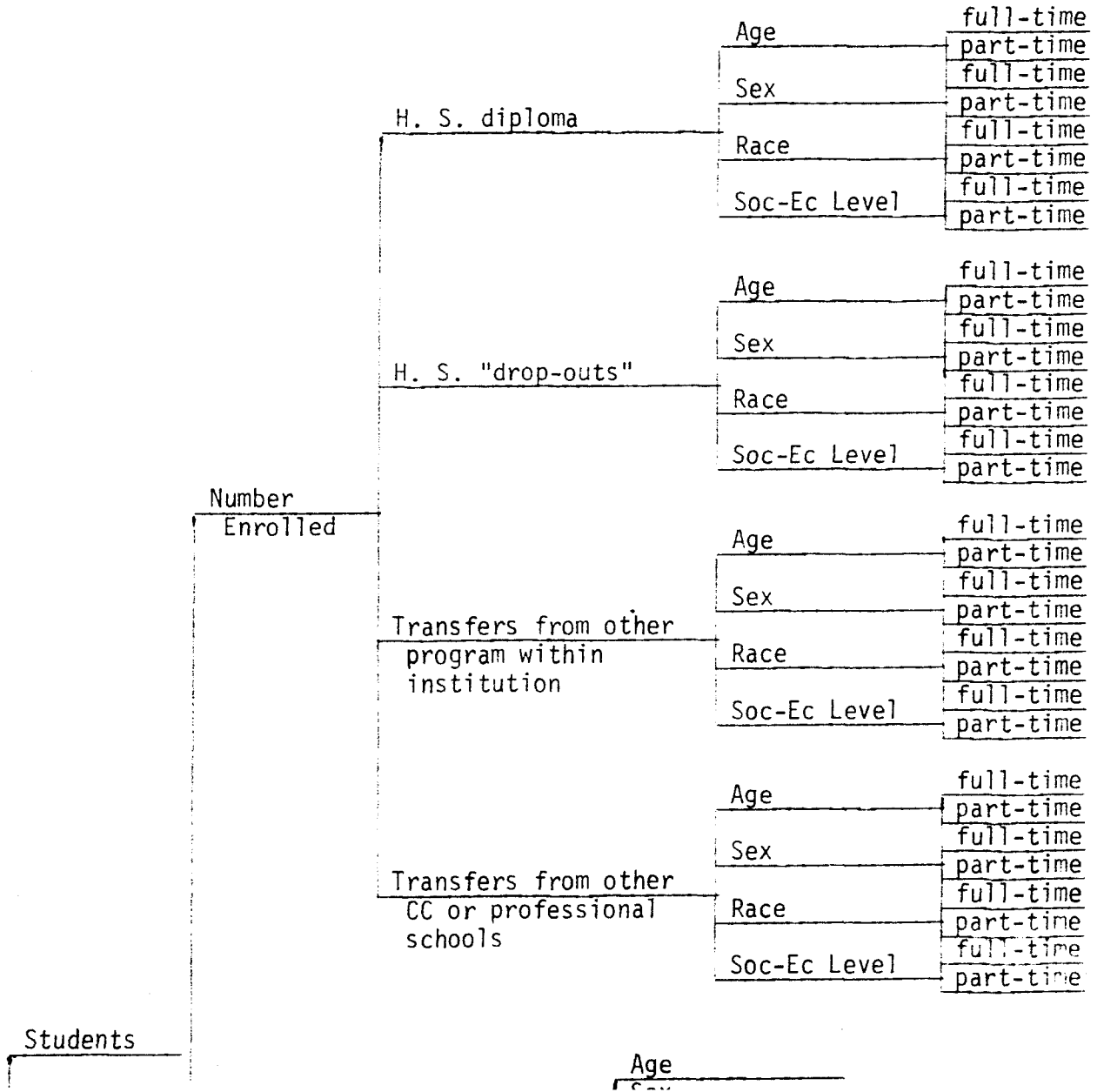
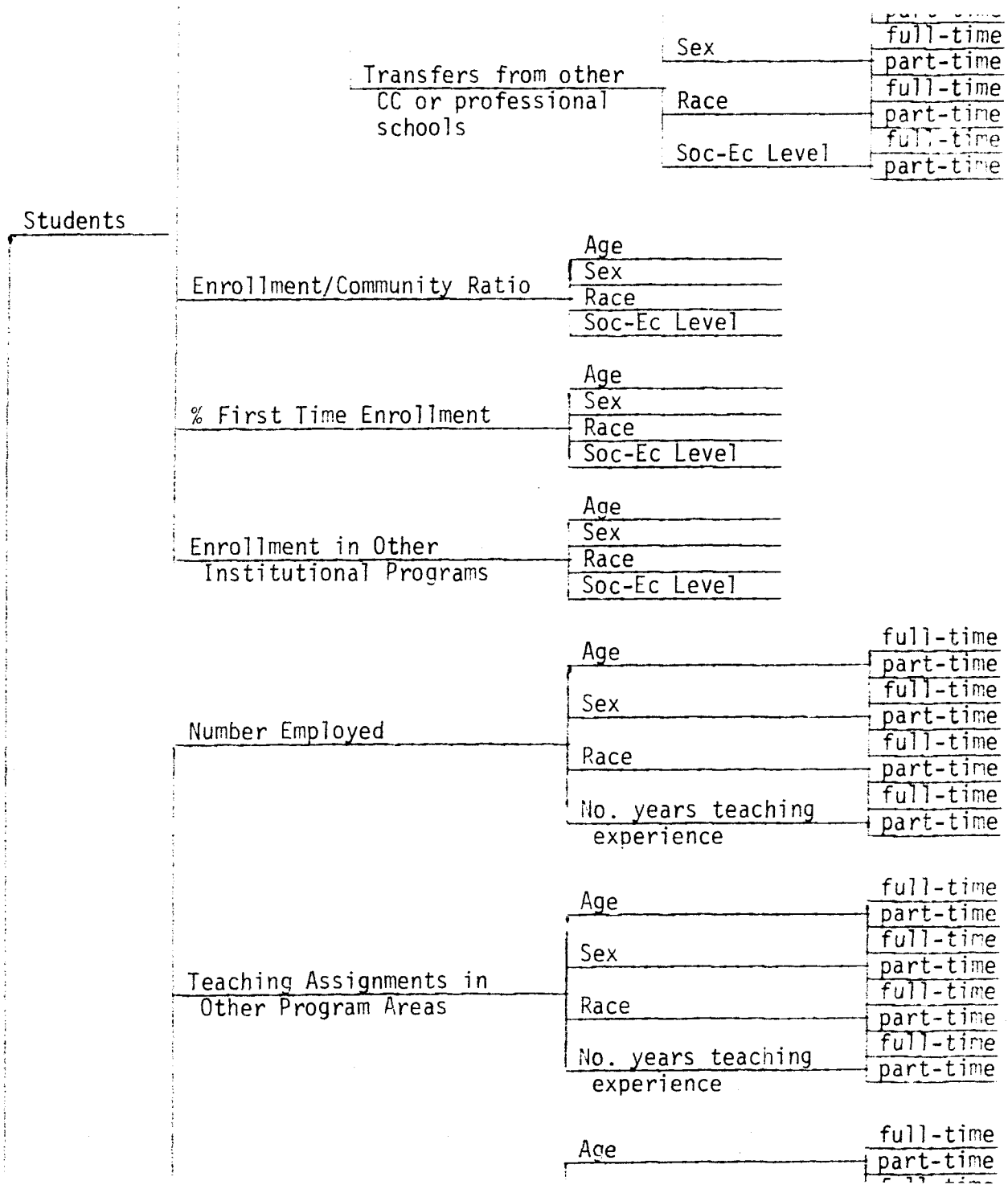
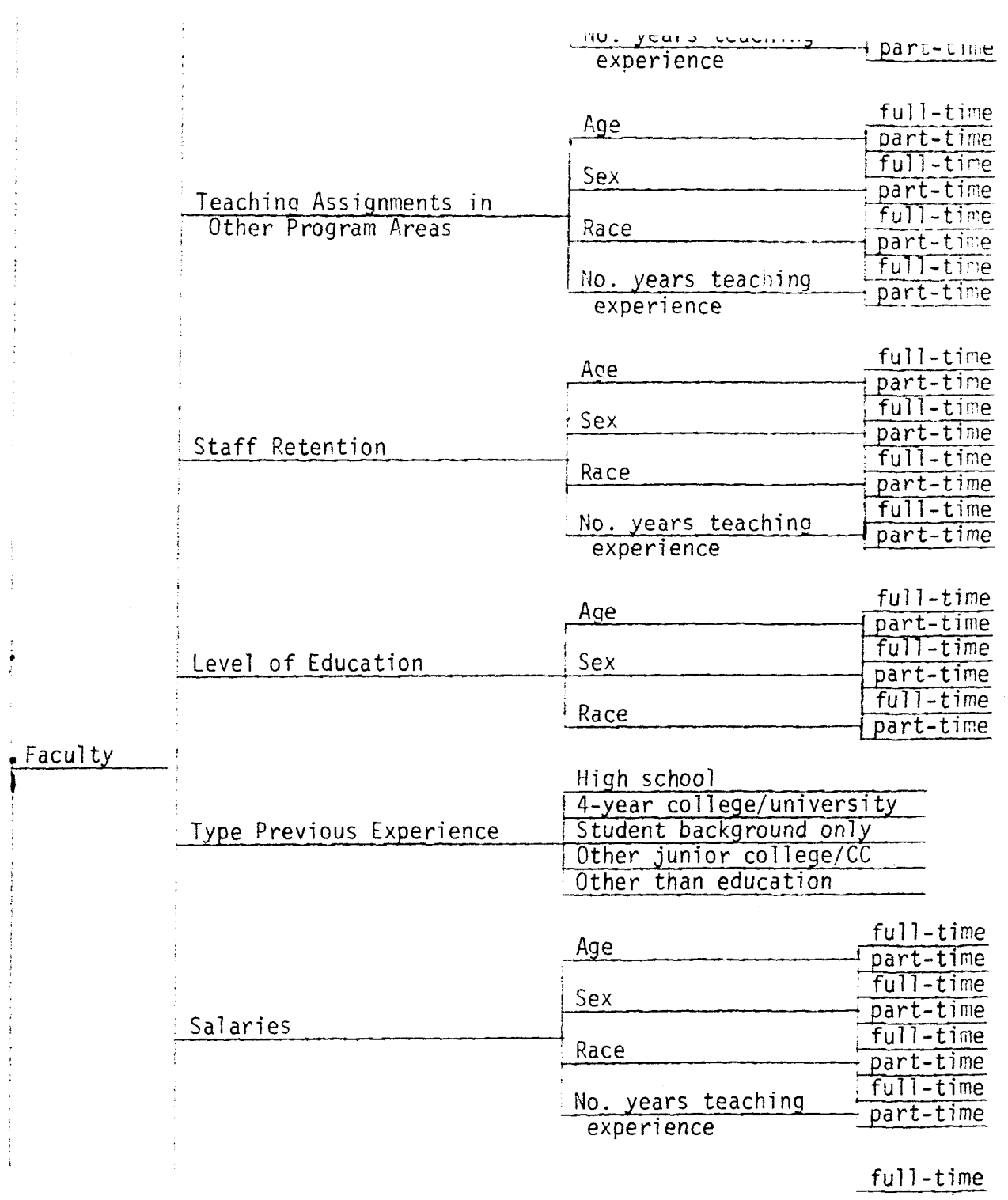
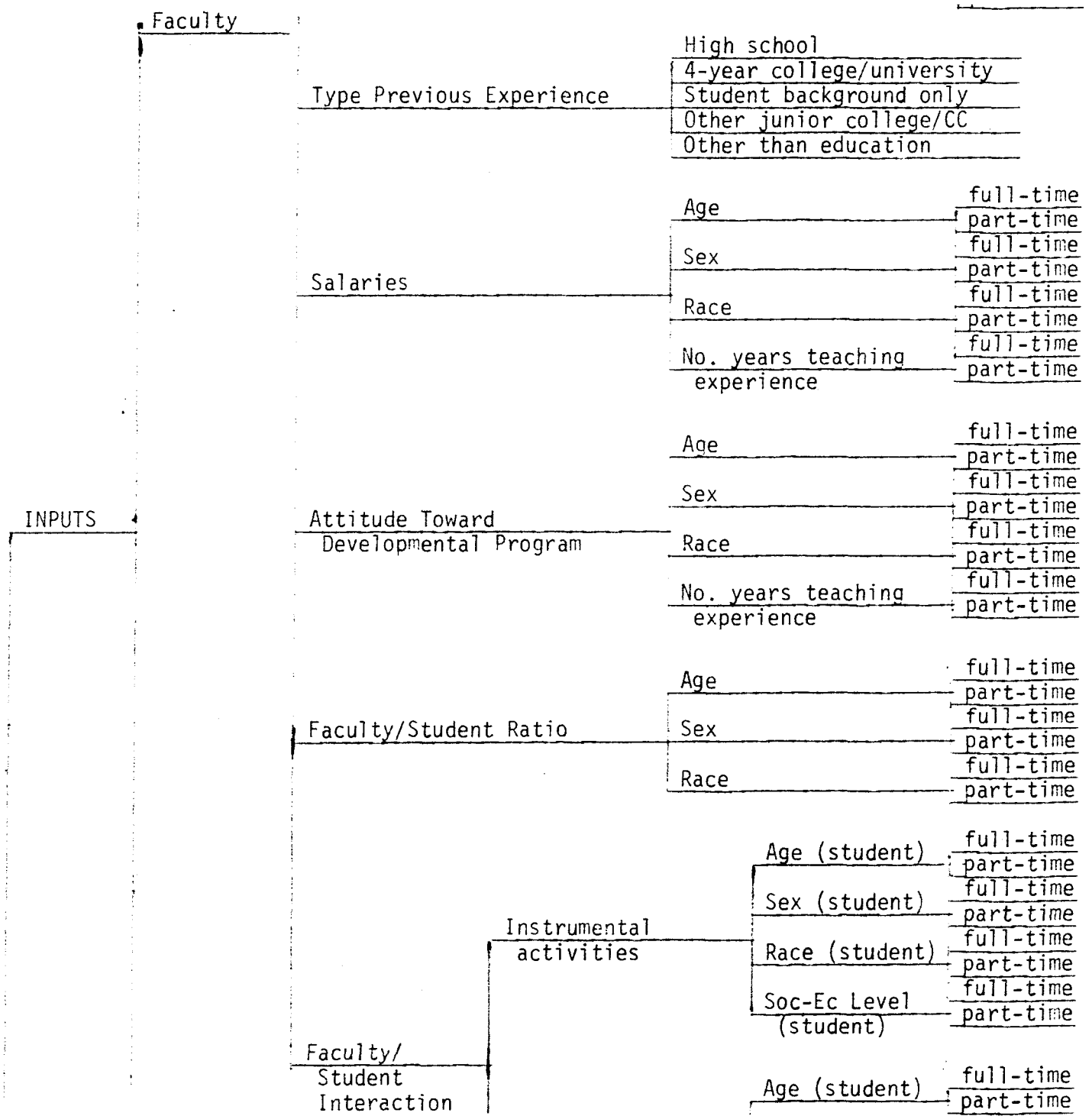


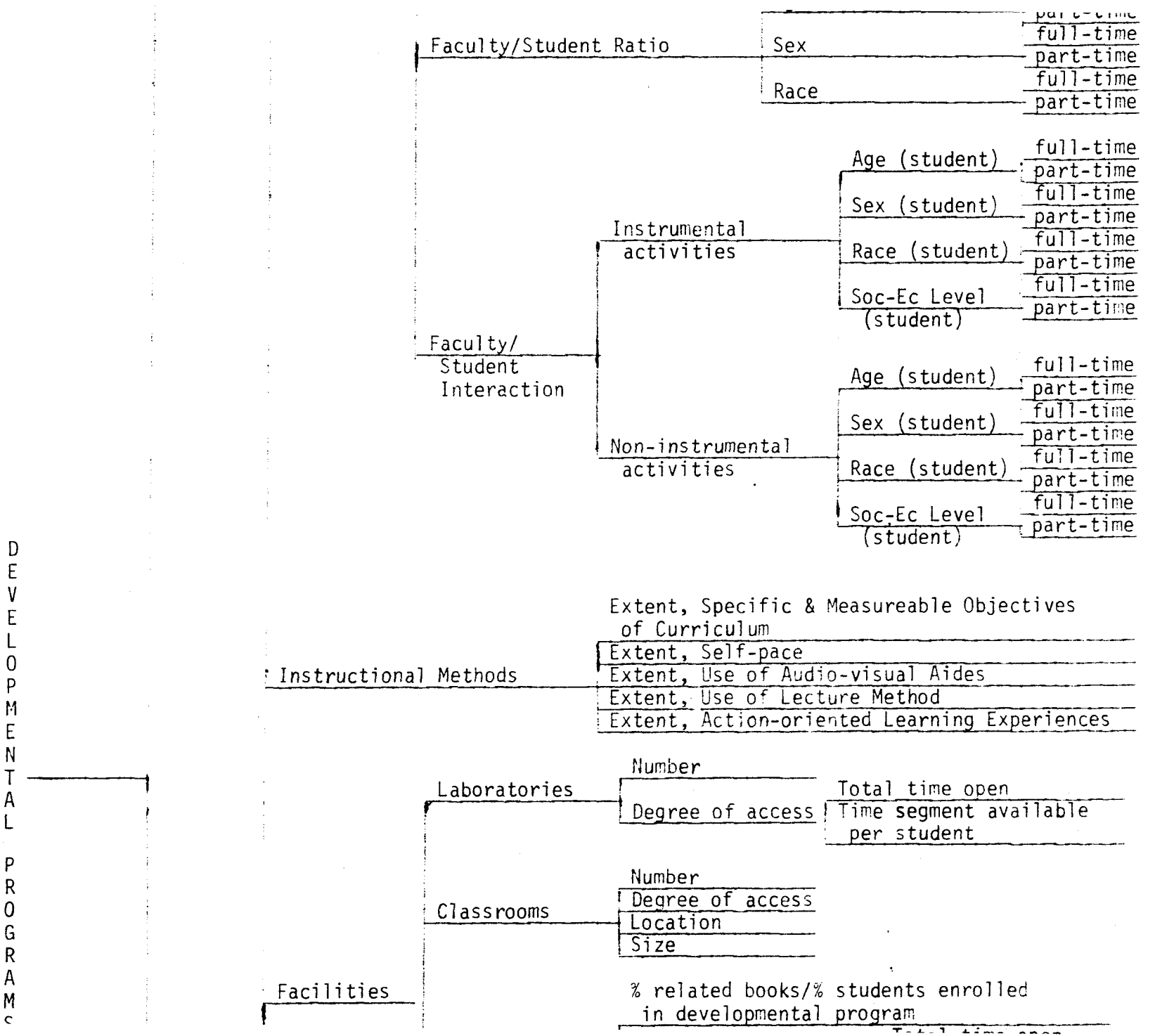
Figure 5: Career Programs


Students
Number Enrolled
H. S. diploma
H. S. "drop-outs"
Transfers from other program within institution
Transfers from other CC or professional schools
Age
Sex
Race
Soc-Ec Level
full-time
part-time
Age


Transfers from other CC or professional schools
Sex
Race
Soc-Ec Level
full-time
part-time
full-time
part-time
full-time
part-time
Students
Enrollment/Community Ratio
Age
Sex
Race
Soc-Ec Level
% First Time Enrollment
Age
Sex
Race
Soc-Ec Level
Enrollment in Other Institutional Programs
Age
Sex
Race
Soc-Ec Level
Number Employed
Age
Sex
Race
No. years teaching experience
full-time
part-time
full-time
part-time
full-time
part-time
full-time
part-time
Teaching Assignments in Other Program Areas
Age
Sex
Race
No. years teaching experience
full-time
part-time
full-time
part-time
full-time
part-time
full-time
part-time
Age
full-time
part-time

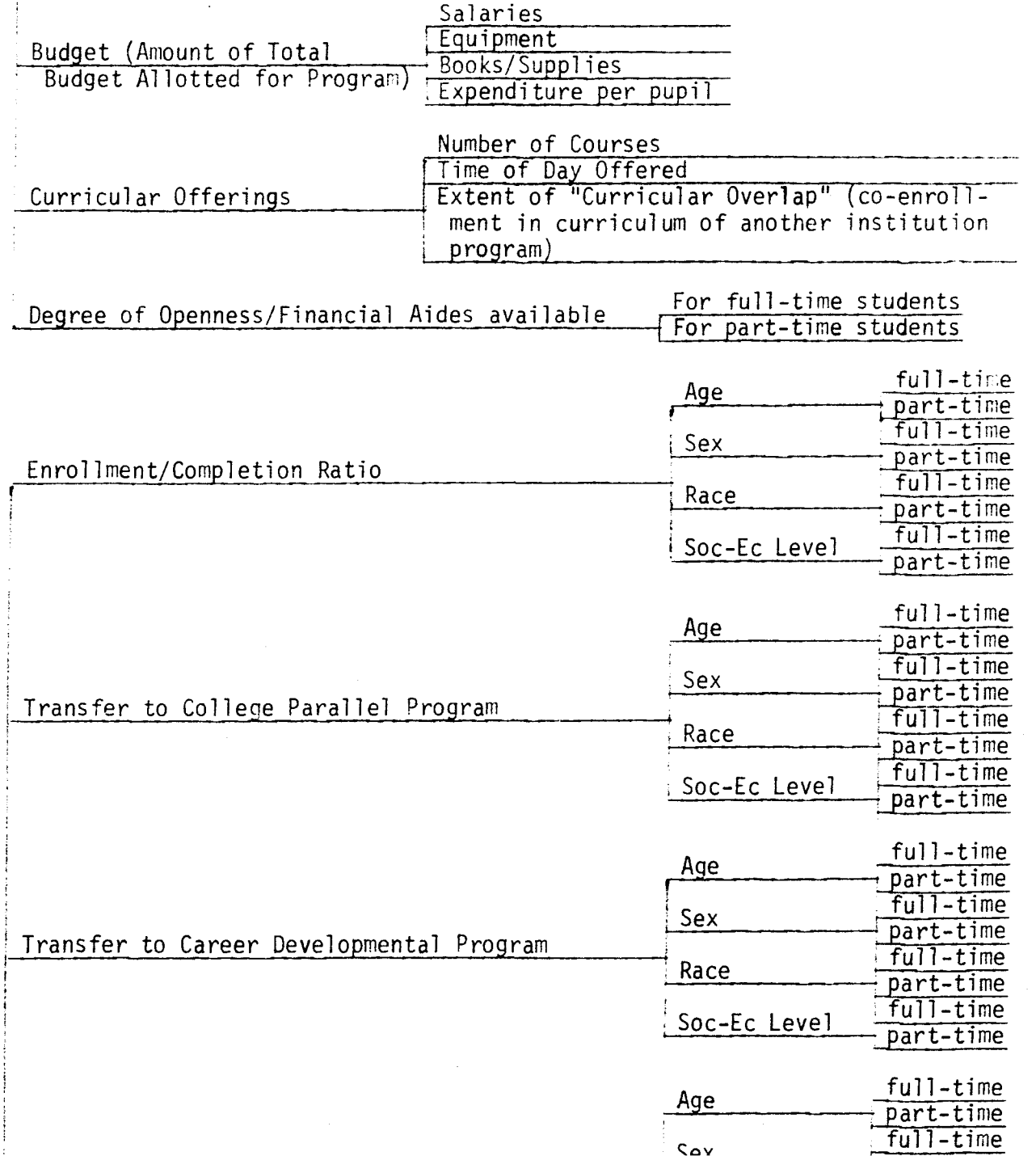

Faculty
Teaching Assignments in Other Program Areas
Staff Retention
Level of Education
Type Previous Experience
Salaries
Age
Sex
Race
No. years teaching experience
full-time
part-time
High school
4-year college/university
Student background only
Other junior college/CC
Other than education

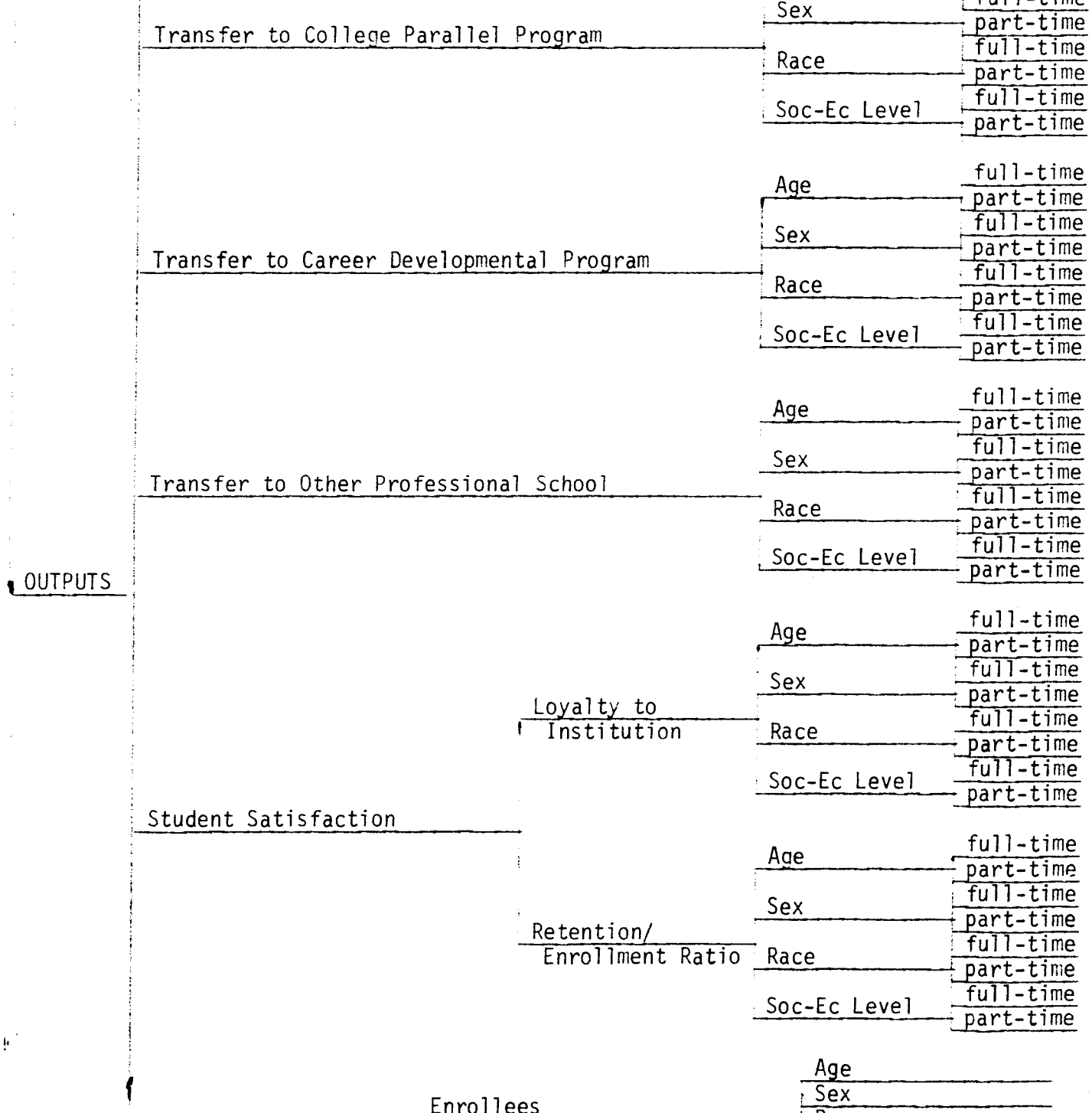

INPUTS
Faculty
Type Previous Experience
High school
4-year college/university
Student background only
Other junior college/CC
Other than education
Salaries
Age
Sex
Race
No. years teaching experience
full-time
part-time
Attitude Toward Developmental Program
Age
Sex
Race
No. years teaching experience
full-time
part-time
Faculty/Student Ratio
Age
Sex
Race
full-time
part-time
Faculty/ Student Interaction
Instrumental activities
Age (student)
Sex (student)
Race (student)
Soc-Ec Level (student)
full-time
part-time


DEVELOPMENTAL PROGRAMS
Faculty/Student Ratio
Sex
full-time
part-time
Race
full-time
part-time
Faculty/ Student Interaction
Instrumental activities
Age (student)
full-time
part-time
Sex (student)
full-time
part-time
Race (student)
full-time
part-time
Soc-Ec Level (student)
full-time
part-time
Non-instrumental activities
Age (student)
full-time
part-time
Sex (student)
full-time
part-time
Race (student)
full-time
part-time
Soc-Ec Level (student)
full-time
part-time
Instructional Methods
Extent, Specific & Measureable Objectives of Curriculum
Extent, Self-pace
Extent, Use of Audio-visual Aides
Extent, Use of Lecture Method
Extent, Action-oriented Learning Experiences
Facilities
Laboratories
Number
Degree of access
Total time open
Time segment available per student
Classrooms
Number
Degree of access
Location
Size
% related books/% students enrolled in developmental program

DEVELOPMENTAL PROGRAMS

- Instructional Methods
  - of Curriculum
  - Extent, Self-pace
  - Extent, Use of Audio-visual Aides
  - Extent, Use of Lecture Method
  - Extent, Action-oriented Learning Experiences
- Facilities
  - Laboratories
    - Number
    - Degree of access
      - Total time open
      - Time segment available per student
  - Classrooms
    - Number
    - Degree of access
    - Location
    - Size
  - Library
    - % related books/% students enrolled in developmental program
    - Degree of access
      - Total time open
      - Special libraries
  - Audio-Visual Aides
    - Variety
    - Access
      - Total time open
      - Time segment available per student
- Budget (Amount of Total Budget Allotted for Program)
  - Salaries
  - Equipment
  - Books/Supplies
  - Expenditure per pupil
- Curricular Offerings
  - Number of Courses
  - Time of Day Offered
  - Extent of "Curricular Overlap" (co-enrollment in curriculum of another institution program)
- Degree of Openness/Financial Aides available
  - For full-time students
  - For part-time students
- Enrollment/Completion Ratio
  - Age
    - full-time
    - part-time
  - Sex
    - full-time
    - part-time
  - Race
    - full-time


Budget (Amount of Total Budget Allotted for Program)
Salaries
Equipment
Books/Supplies
Expenditure per pupil
Curricular Offerings
Number of Courses
Time of Day Offered
Extent of "Curricular Overlap" (co-enrollment in curriculum of another institution program)
Degree of Openness/Financial Aides available
For full-time students
For part-time students
Enrollment/Completion Ratio
Age
Sex
Race
Soc-Ec Level
full-time
part-time
Transfer to College Parallel Program
Transfer to Career Developmental Program


OUTPUTS
Transfer to College Parallel Program
Transfer to Career Developmental Program
Transfer to Other Professional School
Student Satisfaction
Loyalty to Institution
Retention/ Enrollment Ratio
Enrollees
Sex
Race
Soc-Ec Level
Age
full-time
part-time

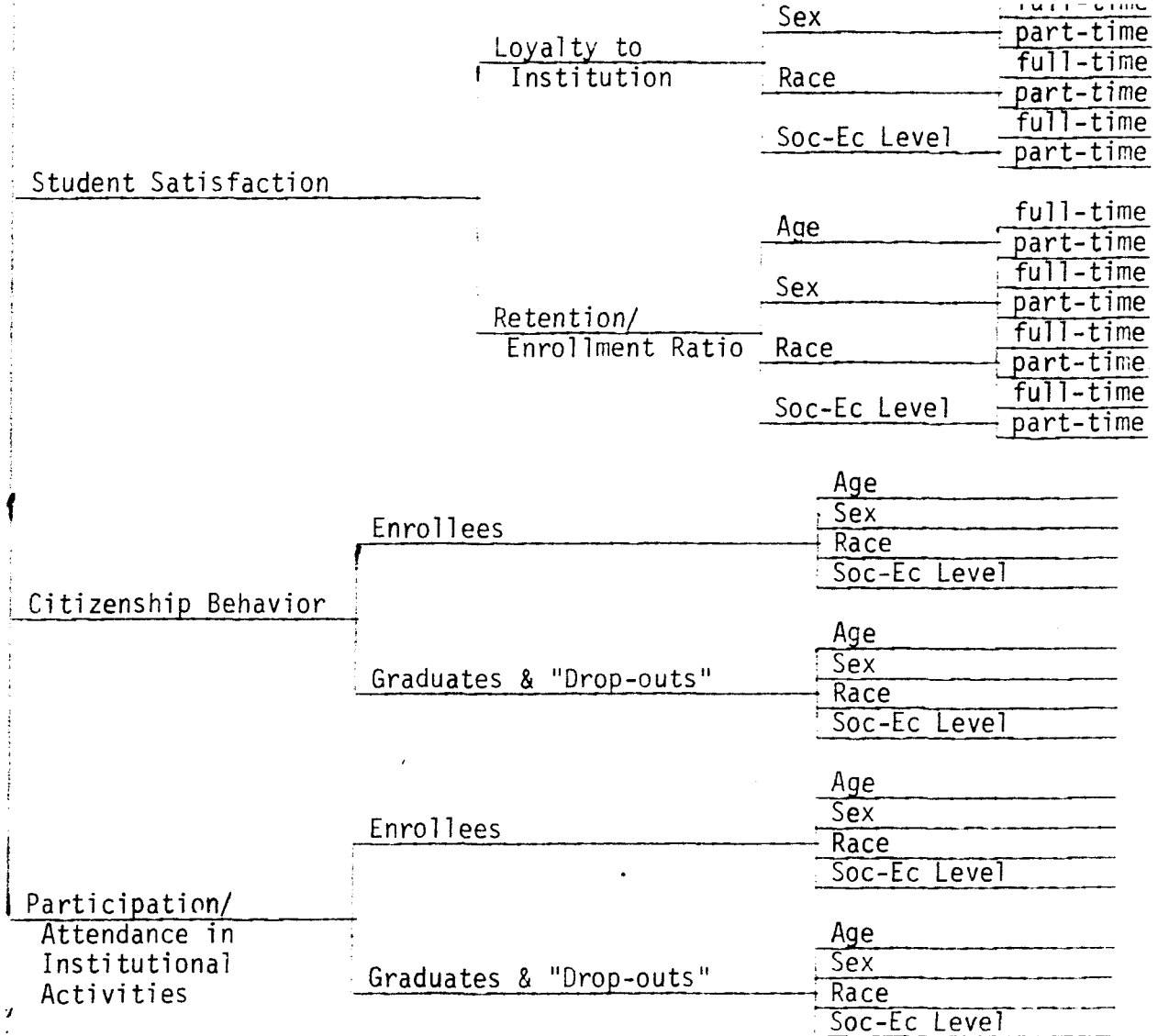
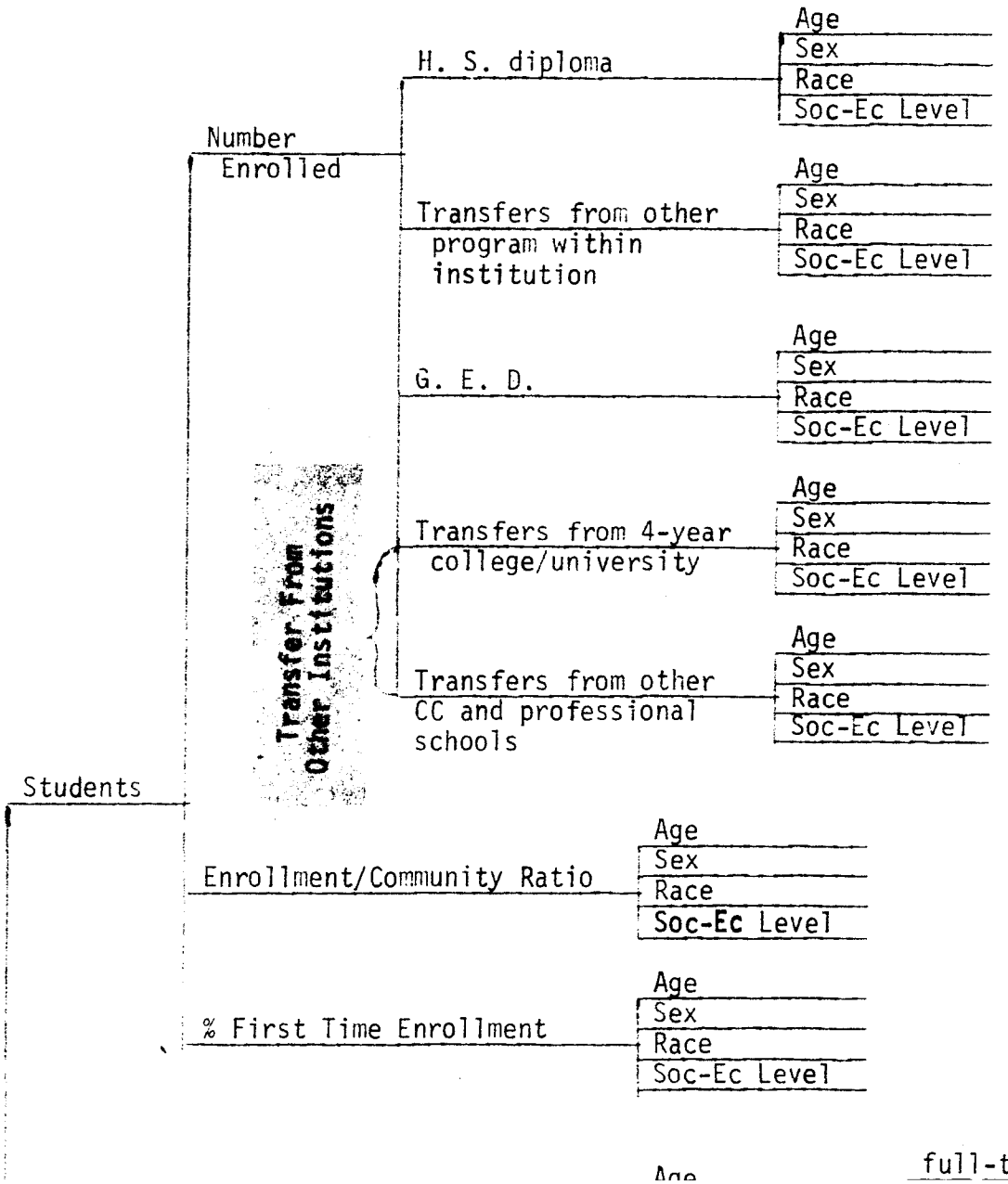
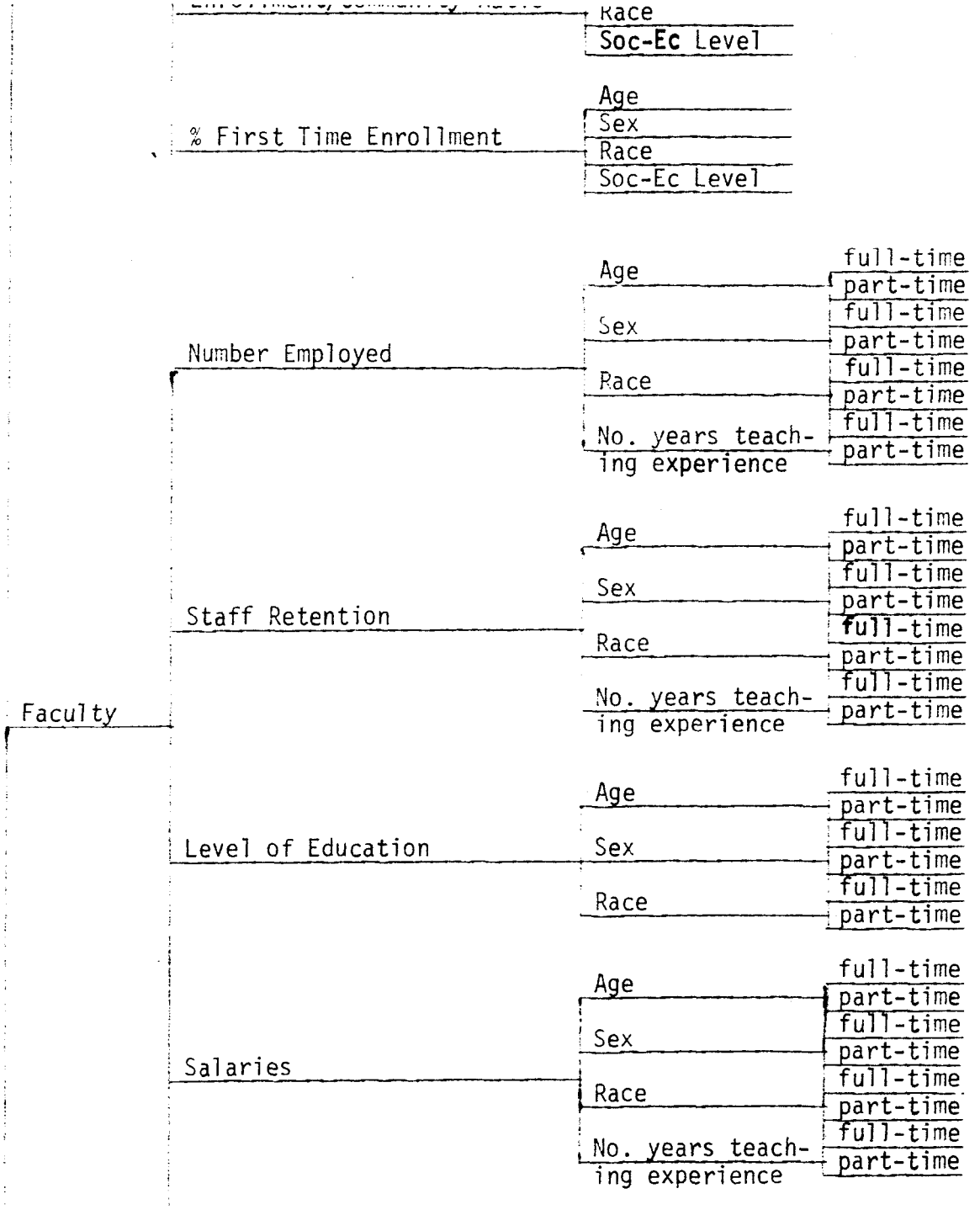
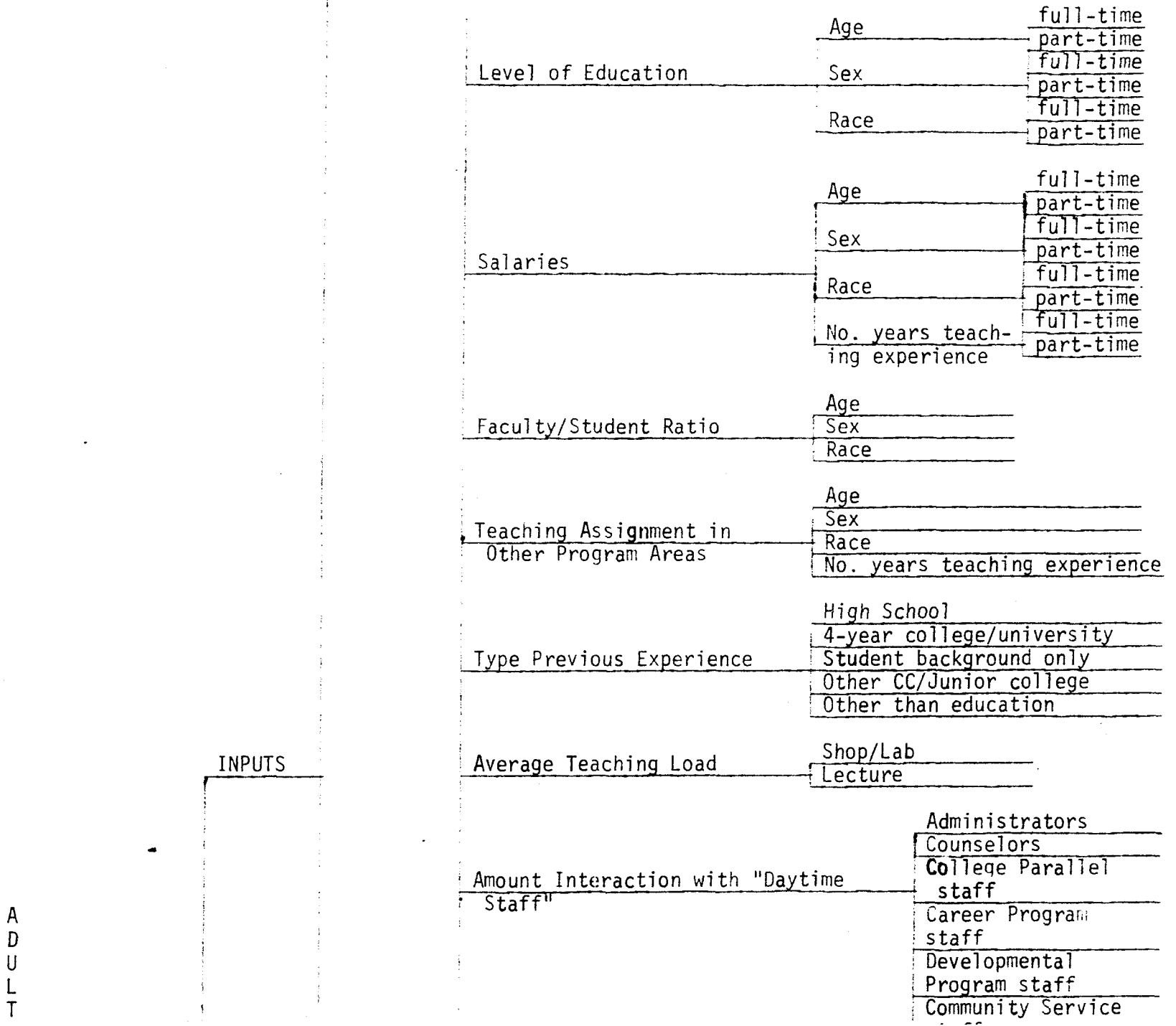
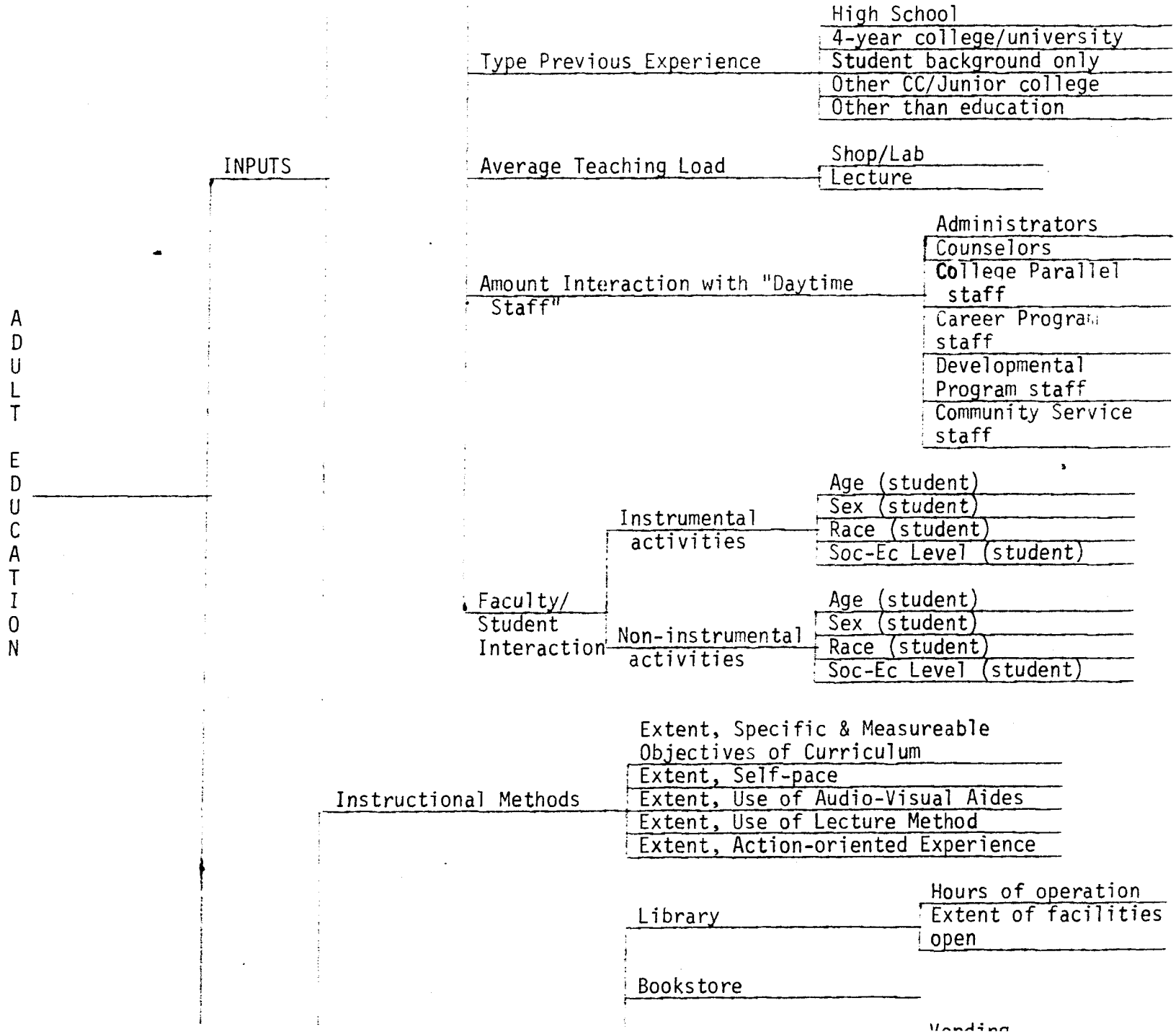


Figure 6: Developmental Programs

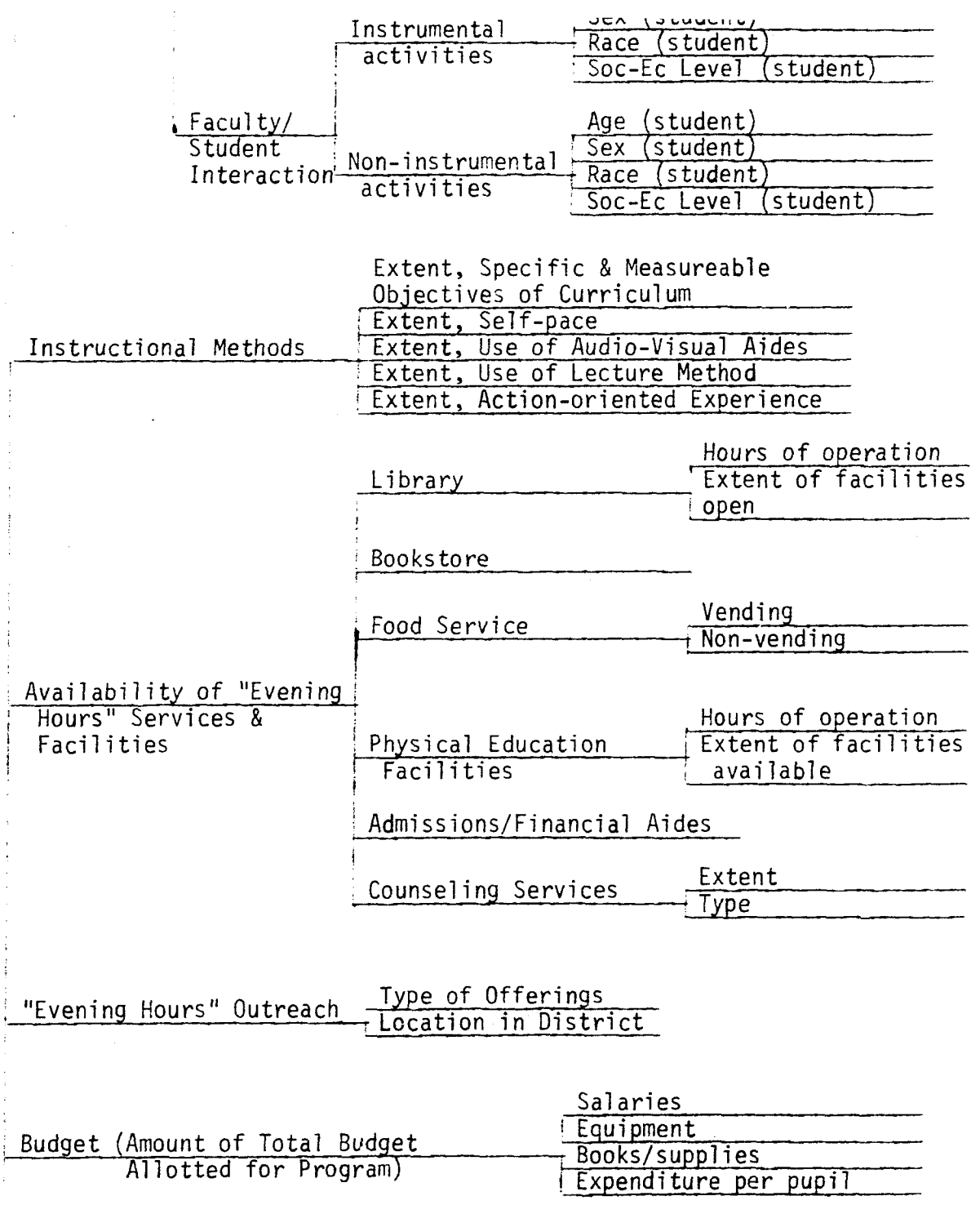

Students
Number Enrolled
H. S. diploma
Transfers from other program within institution
G. E. D.
Transfers from 4-year college/university
Transfers from other CC and professional schools
Transfer From Other Institutions
Age
Sex
Race
Soc-Ec Level
Enrollment/Community Ratio
% First Time Enrollment
full-time

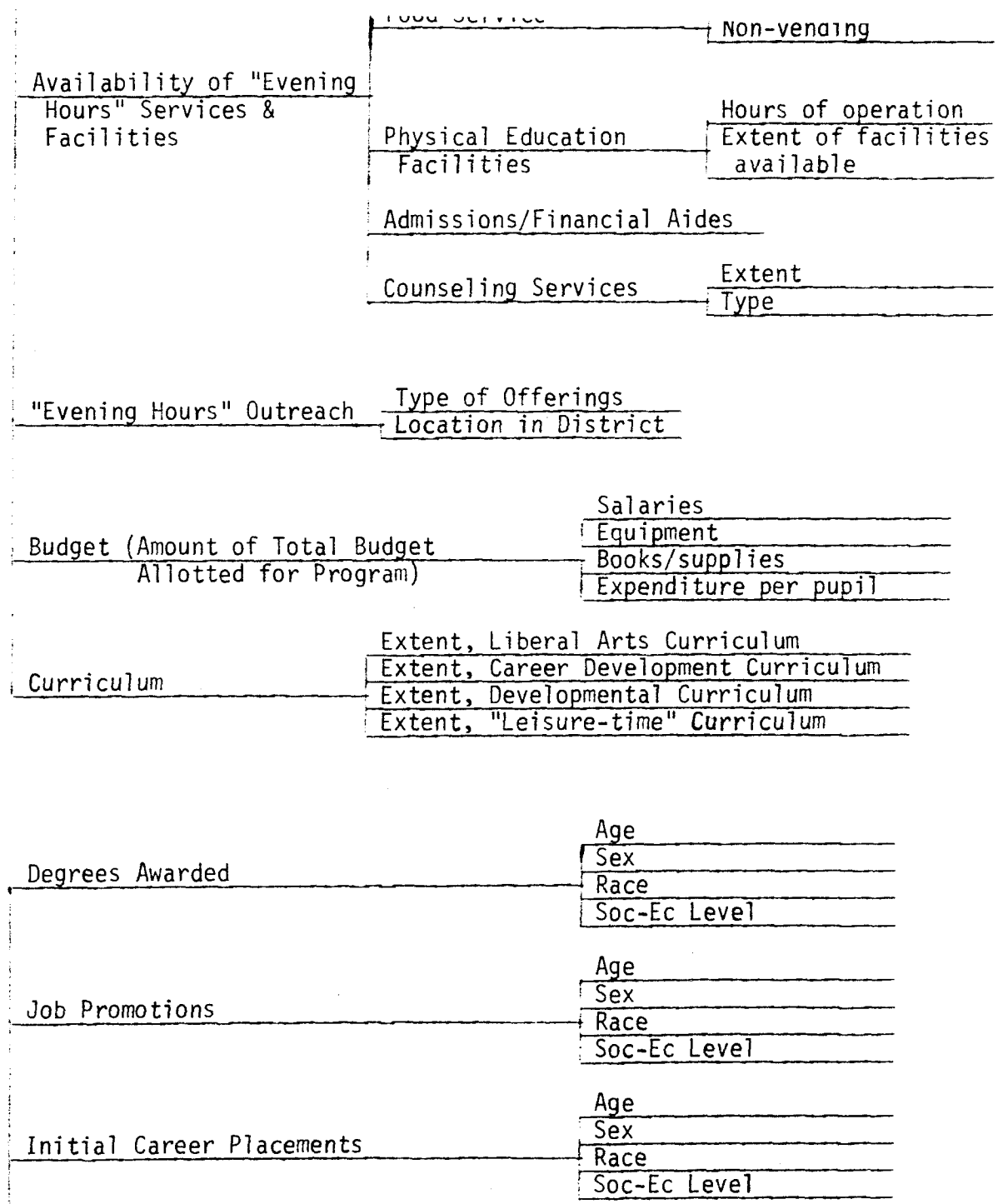

Race
Soc-Ec Level
% First Time Enrollment
Age
Sex
Race
Soc-Ec Level
Number Employed
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teach-ing experience
full-time
part-time
Staff Retention
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teach-ing experience
full-time
part-time
Faculty
Level of Education
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Salaries
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teach-ing experience
full-time
part-time


ADULT
INPUTS
Level of Education
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Salaries
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
No. years teaching experience
full-time
part-time
Faculty/Student Ratio
Age
Sex
Race
Teaching Assignment in Other Program Areas
Age
Sex
Race
No. years teaching experience
Type Previous Experience
High School
4-year college/university
Student background only
Other CC/Junior college
Other than education
Average Teaching Load
Shop/Lab
Lecture
Amount Interaction with "Daytime Staff"
Administrators
Counselors
College Parallel staff
Career Program staff
Developmental Program staff
Community Service


ADULT EDUCATION
INPUTS
Type Previous Experience
High School
4-year college/university
Student background only
Other CC/Junior college
Other than education
Average Teaching Load
Shop/Lab
Lecture
Amount Interaction with "Daytime Staff"
Administrators
Counselors
College Parallel staff
Career Program staff
Developmental Program staff
Community Service staff
Faculty/ Student Interaction
Instrumental activities
Age (student)
Sex (student)
Race (student)
Soc-Ec Level (student)
Non-instrumental activities
Age (student)
Sex (student)
Race (student)
Soc-Ec Level (student)
Instructional Methods
Extent, Specific & Measureable Objectives of Curriculum
Extent, Self-pace
Extent, Use of Audio-Visual Aides
Extent, Use of Lecture Method
Extent, Action-oriented Experience
Library
Hours of operation
Extent of facilities open
Bookstore

U
C
A
T
I
O
N


Faculty/ Student Interaction
Instrumental activities
Sex (student)
Race (student)
Soc-Ec Level (student)
Non-instrumental activities
Age (student)
Sex (student)
Race (student)
Soc-Ec Level (student)
Instructional Methods
Extent, Specific & Measureable Objectives of Curriculum
Extent, Self-pace
Extent, Use of Audio-Visual Aides
Extent, Use of Lecture Method
Extent, Action-oriented Experience
Availability of "Evening Hours" Services & Facilities
Library
Hours of operation
Extent of facilities open
Bookstore
Food Service
Vending
Non-vending
Physical Education Facilities
Hours of operation
Extent of facilities available
Admissions/Financial Aides
Counseling Services
Extent
Type
"Evening Hours" Outreach
Type of Offerings
Location in District
Budget (Amount of Total Budget Allotted for Program)
Salaries
Equipment
Books/supplies
Expenditure per pupil


Food Service
Non-vending
Availability of "Evening Hours" Services & Facilities
Hours of operation
Physical Education Facilities
Extent of facilities available
Admissions/Financial Aides
Counseling Services
Extent
Type
"Evening Hours" Outreach
Type of Offerings
Location in District
Budget (Amount of Total Budget Allotted for Program)
Salaries
Equipment
Books/supplies
Expenditure per pupil
Curriculum
Extent, Liberal Arts Curriculum
Extent, Career Development Curriculum
Extent, Developmental Curriculum
Extent, "Leisure-time" Curriculum
Degrees Awarded
Age
Sex
Race
Soc-Ec Level
Job Promotions
Age
Sex
Race
Soc-Ec Level
Initial Career Placements
Age
Sex
Race
Soc-Ec Level

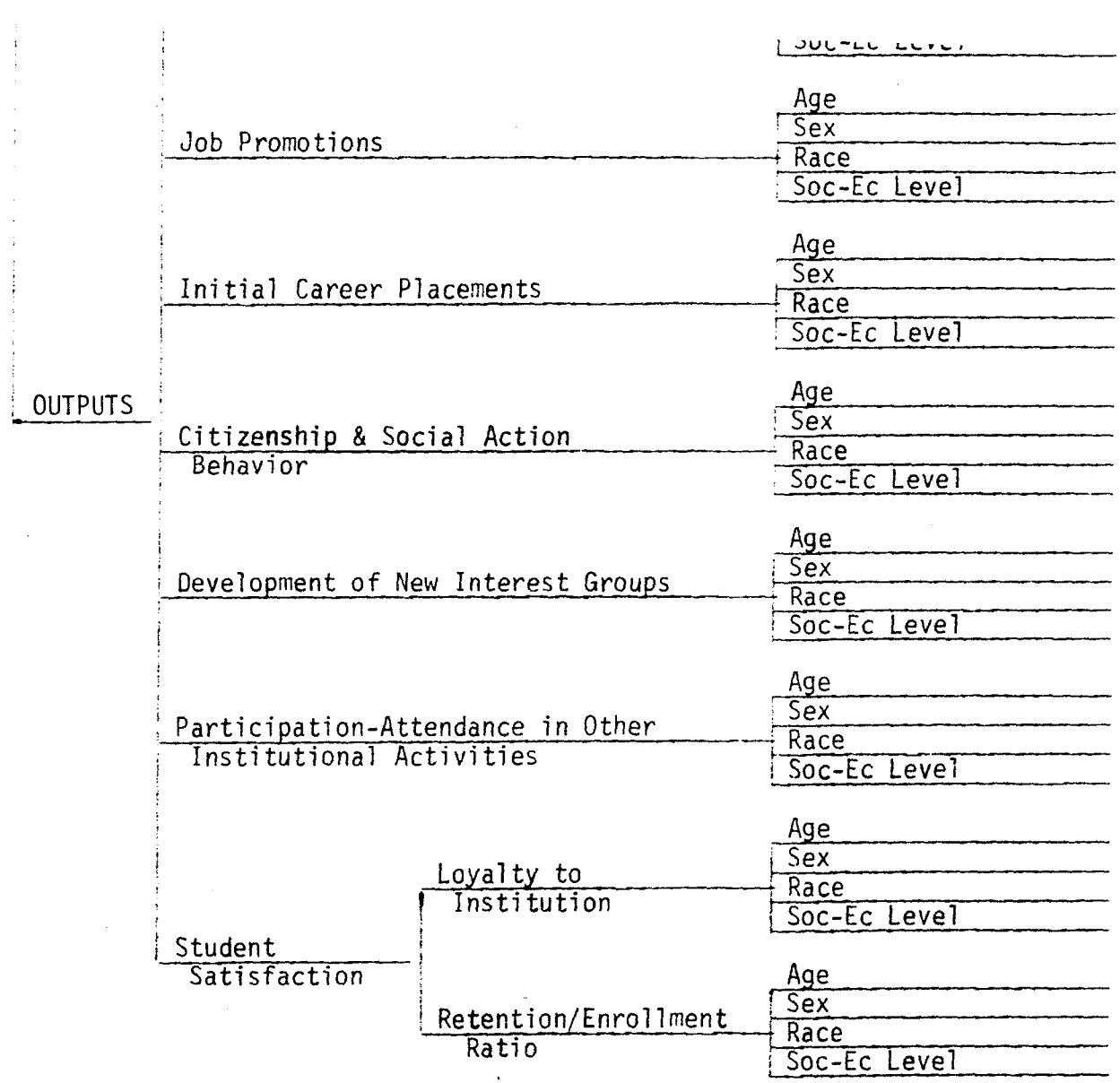
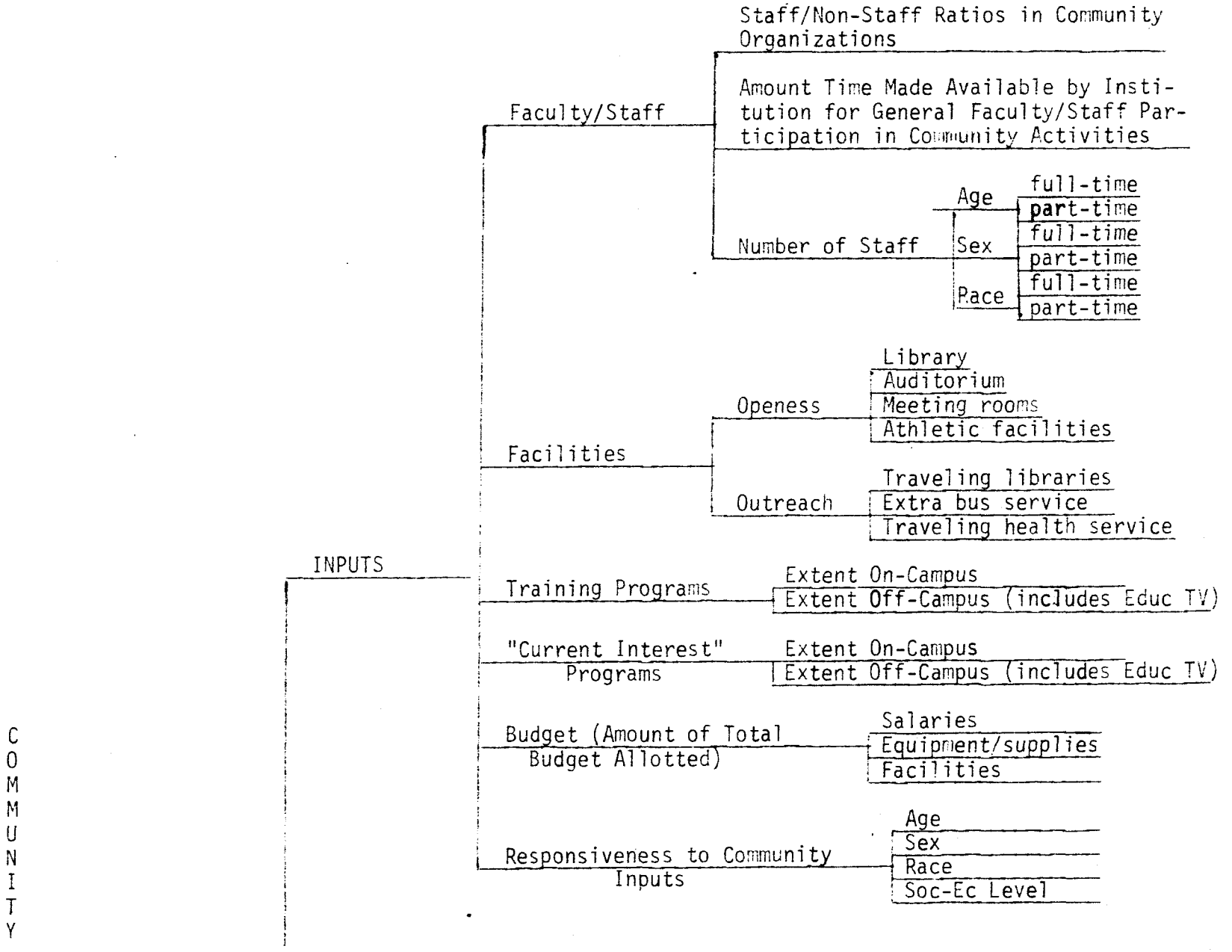
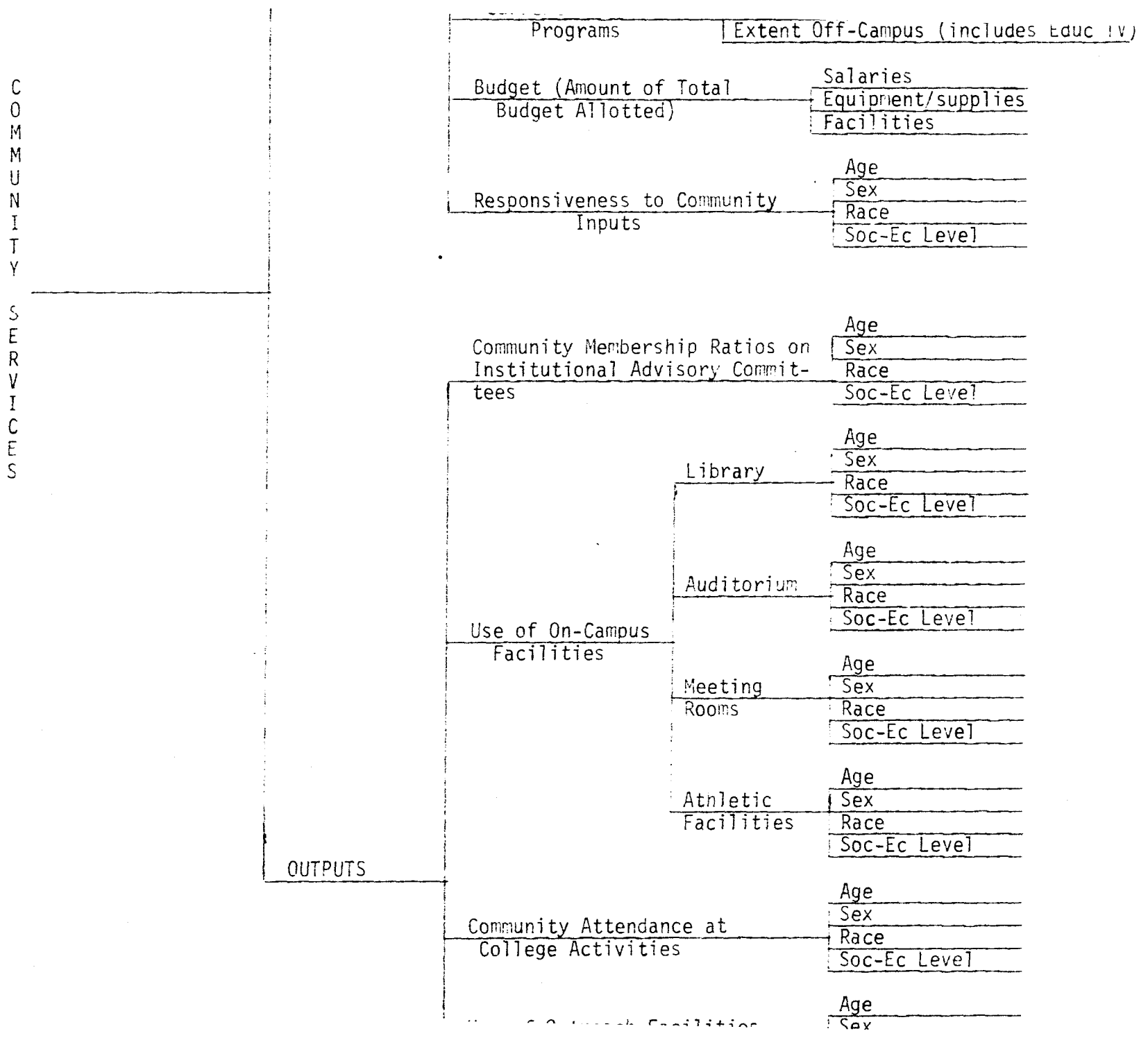


Figure 7: Adult Education


COMMUNITY
INPUTS
Faculty/Staff
Staff/Non-Staff Ratios in Community Organizations
Amount Time Made Available by Institution for General Faculty/Staff Participation in Community Activities
Number of Staff
Age
Sex
Race
full-time
part-time
full-time
part-time
full-time
part-time
Facilities
Openess
Outreach
Library
Auditorium
Meeting rooms
Athletic facilities
Traveling libraries
Extra bus service
Traveling health service
Training Programs
Extent On-Campus
Extent Off-Campus (includes Educ TV)
"Current Interest" Programs
Extent On-Campus
Extent Off-Campus (includes Educ TV)
Budget (Amount of Total Budget Allotted)
Salaries
Equipment/supplies
Facilities
Responsiveness to Community Inputs
Age
Sex
Race
Soc-Ec Level


COMMUNITY SERVICES
OUTPUTS
Programs
Extent Off-Campus (includes Educ TV)
Budget (Amount of Total Budget Allotted)
Salaries
Equipment/supplies
Facilities
Responsiveness to Community Inputs
Age
Sex
Race
Soc-Ec Level
Community Membership Ratios on Institutional Advisory Committees
Age
Sex
Race
Soc-Ec Level
Use of On-Campus Facilities
Library
Age
Sex
Race
Soc-Ec Level
Auditorium
Age
Sex
Race
Soc-Ec Level
Meeting Rooms
Age
Sex
Race
Soc-Ec Level
Athletic Facilities
Age
Sex
Race
Soc-Ec Level
Community Attendance at College Activities
Age
Sex
Race
Soc-Ec Level
Age
Sex

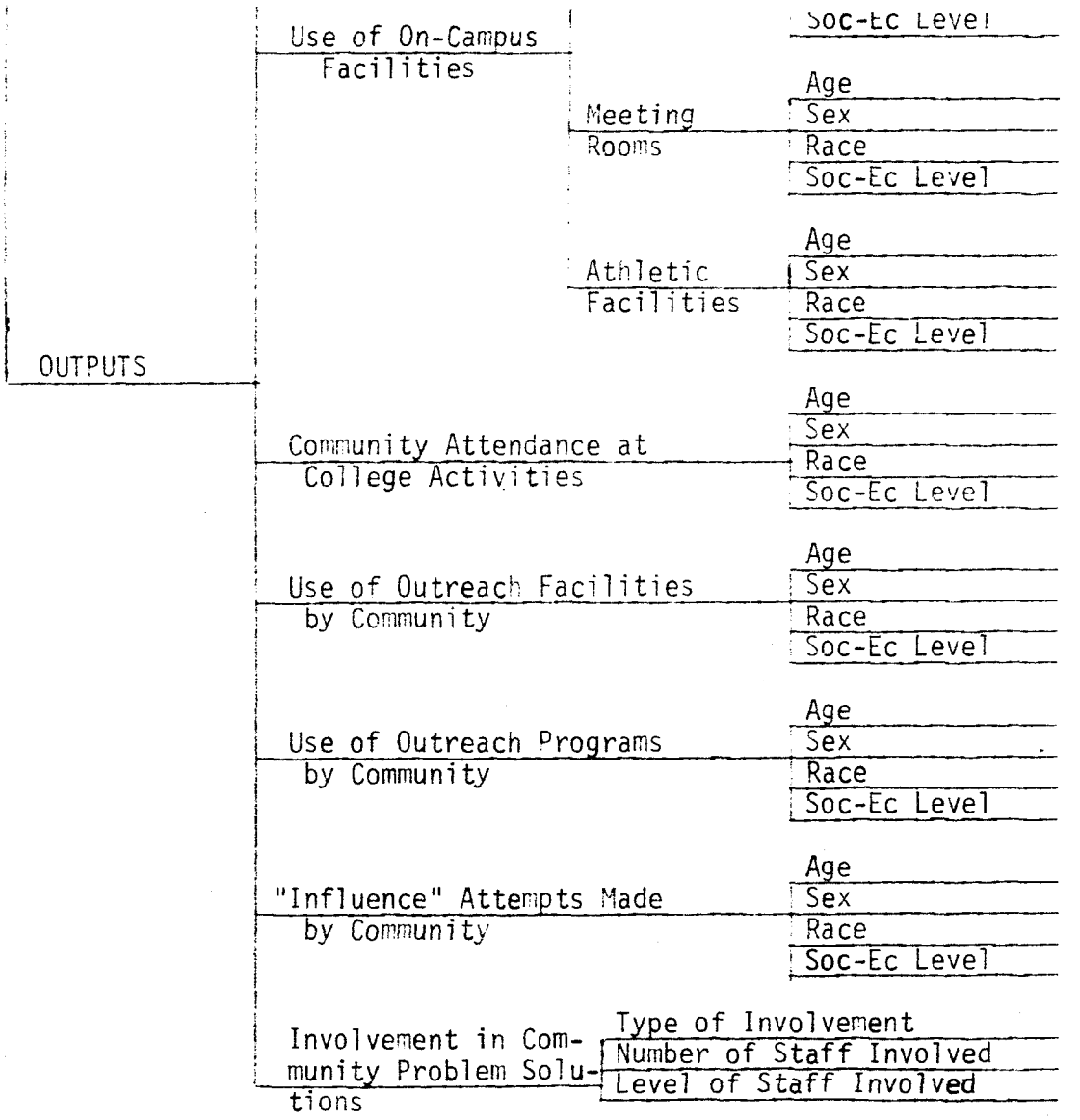
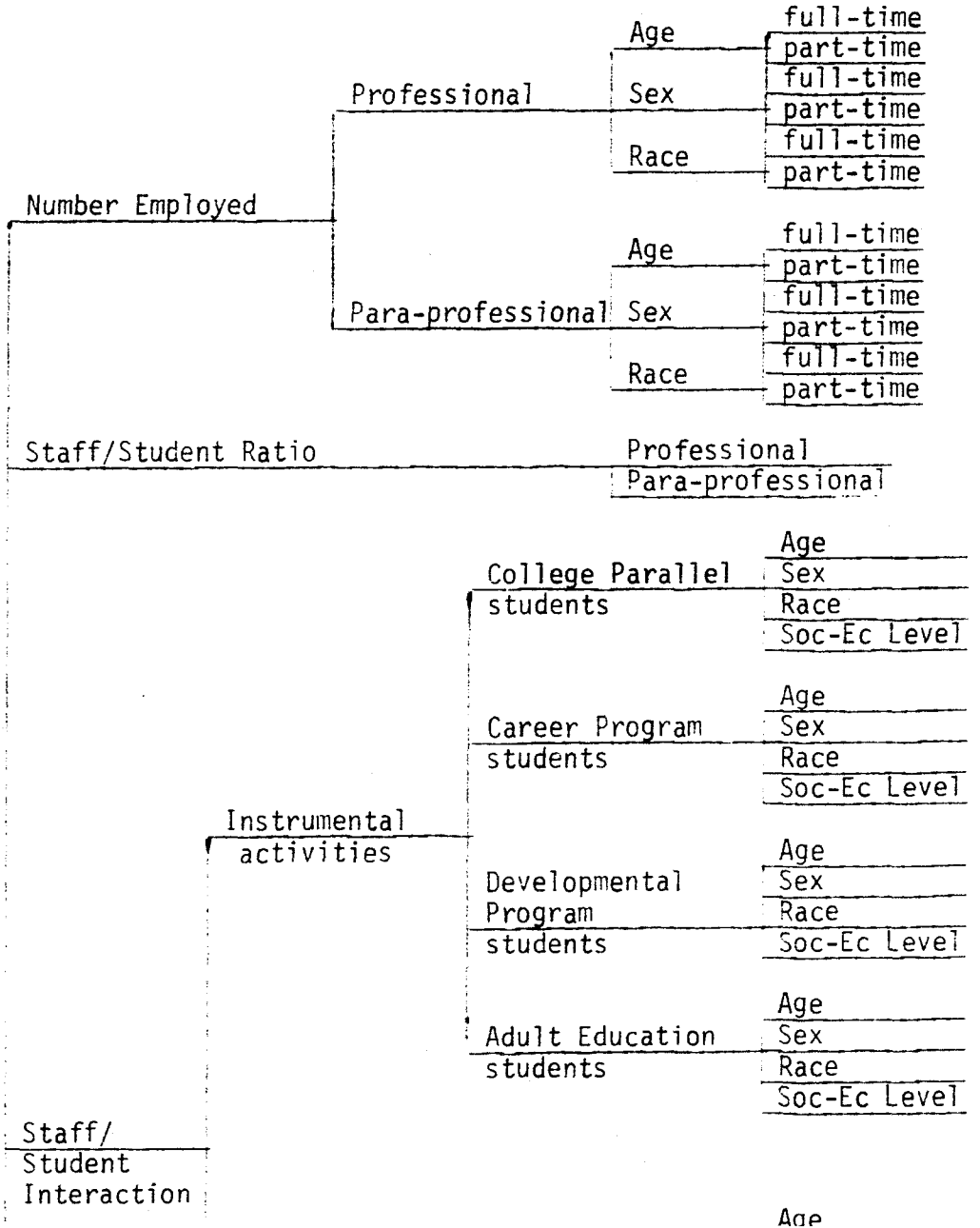
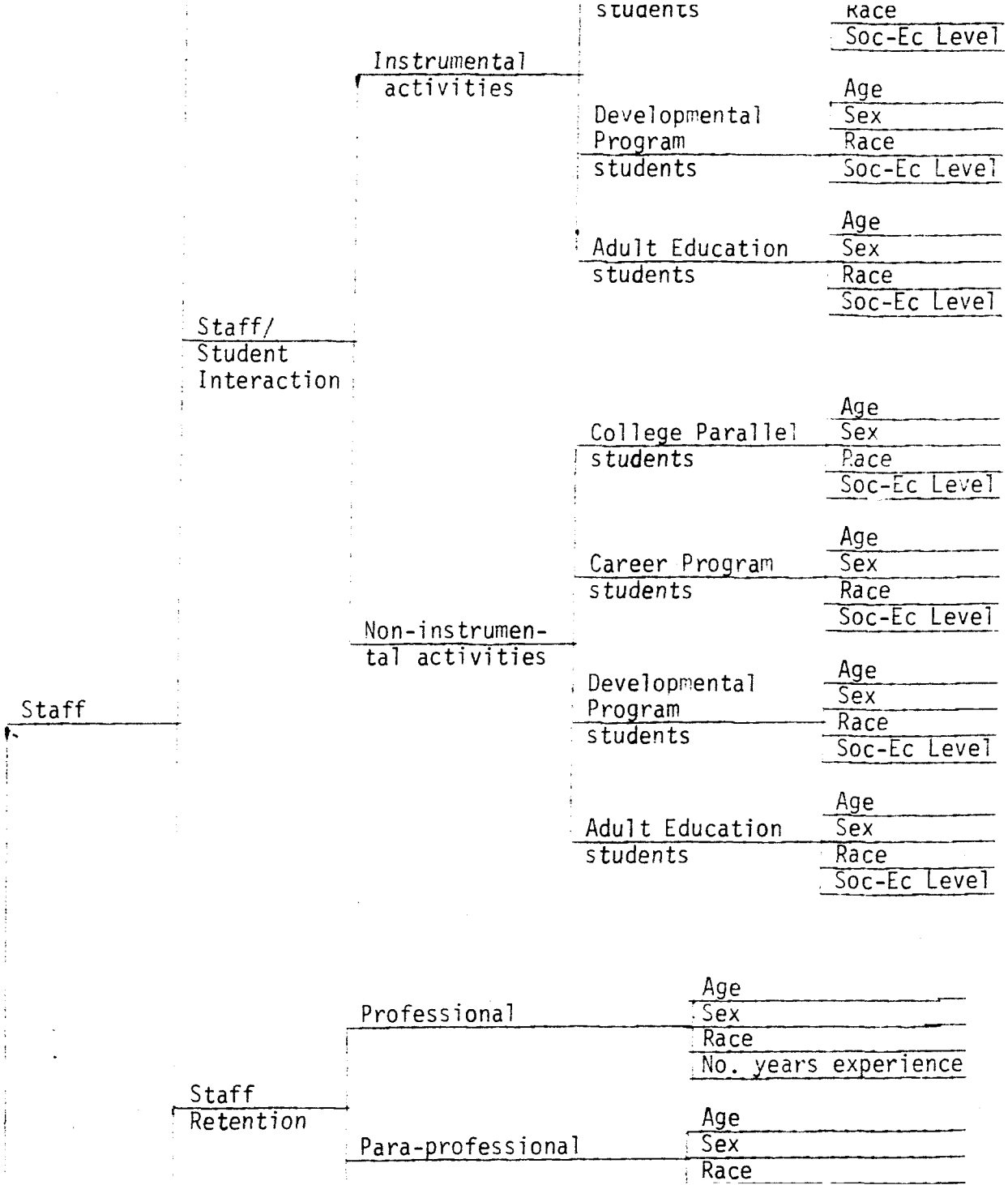
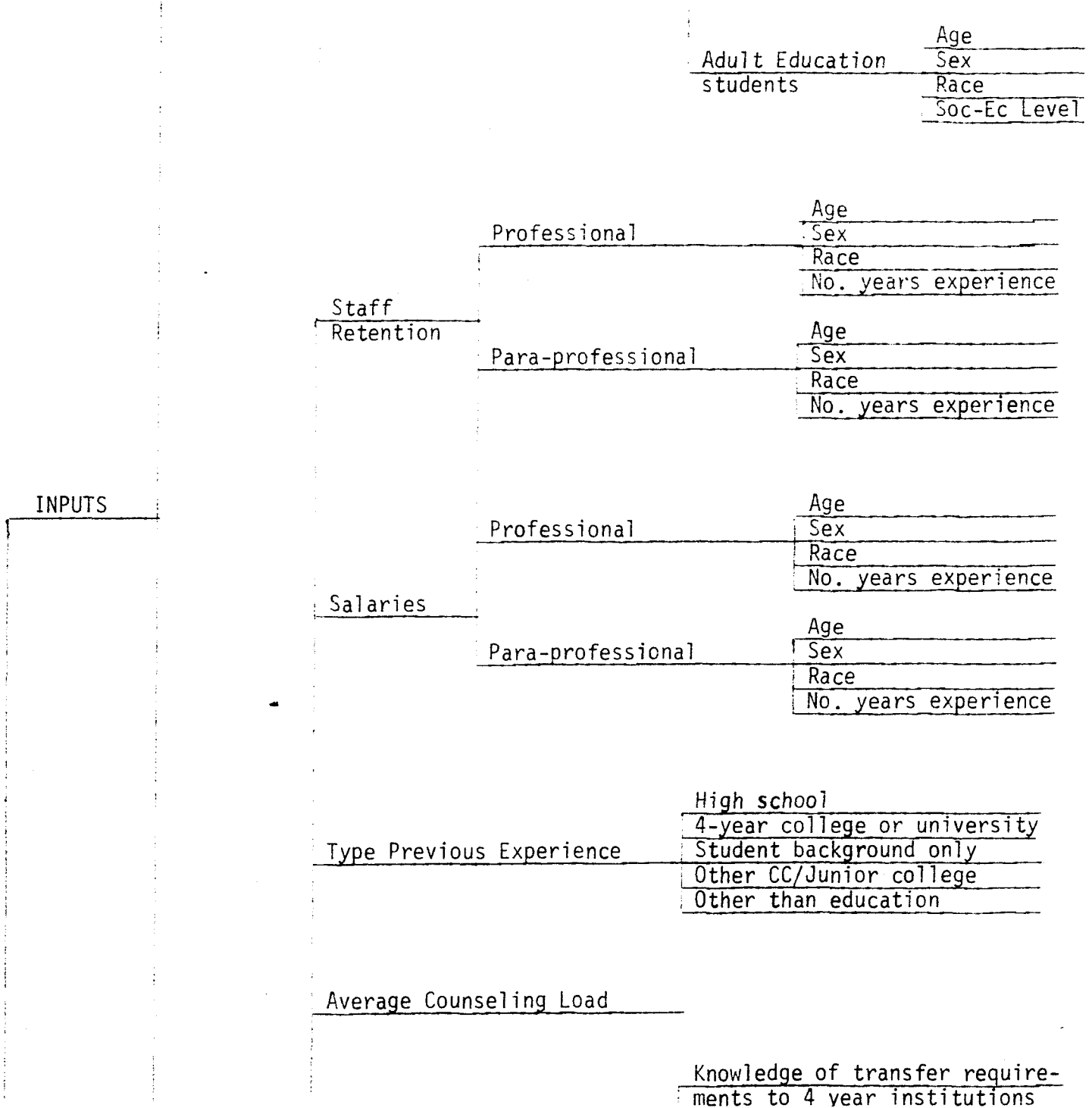
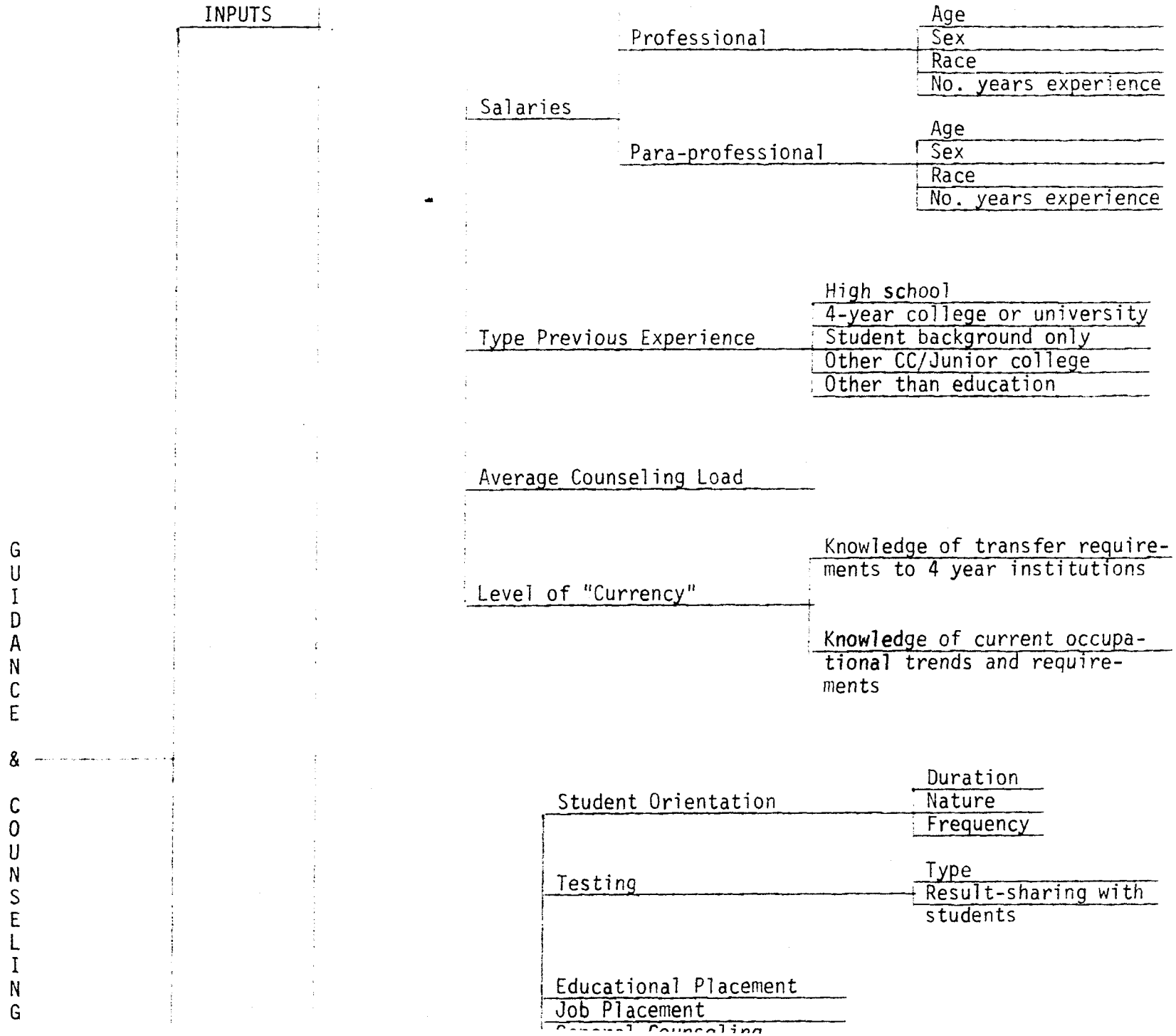


Figure 8: Community Services


Number Employed
Professional
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Para-professional
Age
full-time
part-time
Sex
full-time
part-time
Race
full-time
part-time
Staff/Student Ratio
Professional
Para-professional
Instrumental activities
College Parallel students
Age
Sex
Race
Soc-Ec Level
Career Program students
Age
Sex
Race
Soc-Ec Level
Developmental Program students
Age
Sex
Race
Soc-Ec Level
Adult Education students
Age
Sex
Race
Soc-Ec Level
Staff/ Student Interaction
Age


students
Race
Soc-Ec Level
Instrumental activities
Age
Developmental Program
Sex
Race
students
Soc-Ec Level
Age
Adult Education
Sex
students
Race
Soc-Ec Level
Staff/ Student Interaction
Age
College Parallel
Sex
students
Race
Soc-Ec Level
Age
Career Program
Sex
students
Race
Soc-Ec Level
Non-instrumental activities
Age
Developmental Program
Sex
Staff
Race
students
Soc-Ec Level
Age
Adult Education
Sex
students
Race
Soc-Ec Level
Age
Professional
Sex
Race
No. years experience
Staff Retention
Age
Para-professional
Sex
Race


INPUTS
Adult Education students
Age
Sex
Race
Soc-Ec Level
Staff Retention
Professional
Age
Sex
Race
No. years experience
Para-professional
Age
Sex
Race
No. years experience
Salaries
Professional
Age
Sex
Race
No. years experience
Para-professional
Age
Sex
Race
No. years experience
Type Previous Experience
High school
4-year college or university
Student background only
Other CC/Junior college
Other than education
Average Counseling Load
Knowledge of transfer require-
ments to 4 year institutions


INPUTS
GUIDANCE & COUNSELING
Salaries
Professional
Age
Sex
Race
No. years experience
Para-professional
Age
Sex
Race
No. years experience
Type Previous Experience
High school
4-year college or university
Student background only
Other CC/Junior college
Other than education
Average Counseling Load
Level of "Currency"
Knowledge of transfer requirements to 4 year institutions
Knowledge of current occupational trends and requirements
Student Orientation
Duration
Nature
Frequency
Testing
Type
Result-sharing with students
Educational Placement
Job Placement

GUIDANCE & COUNSELING

Level of "Currency"
- Knowledge of transfer requirements to 4 year institutions
- Knowledge of current occupational trends and requirements

Student Orientation
- Duration
- Nature
- Frequency

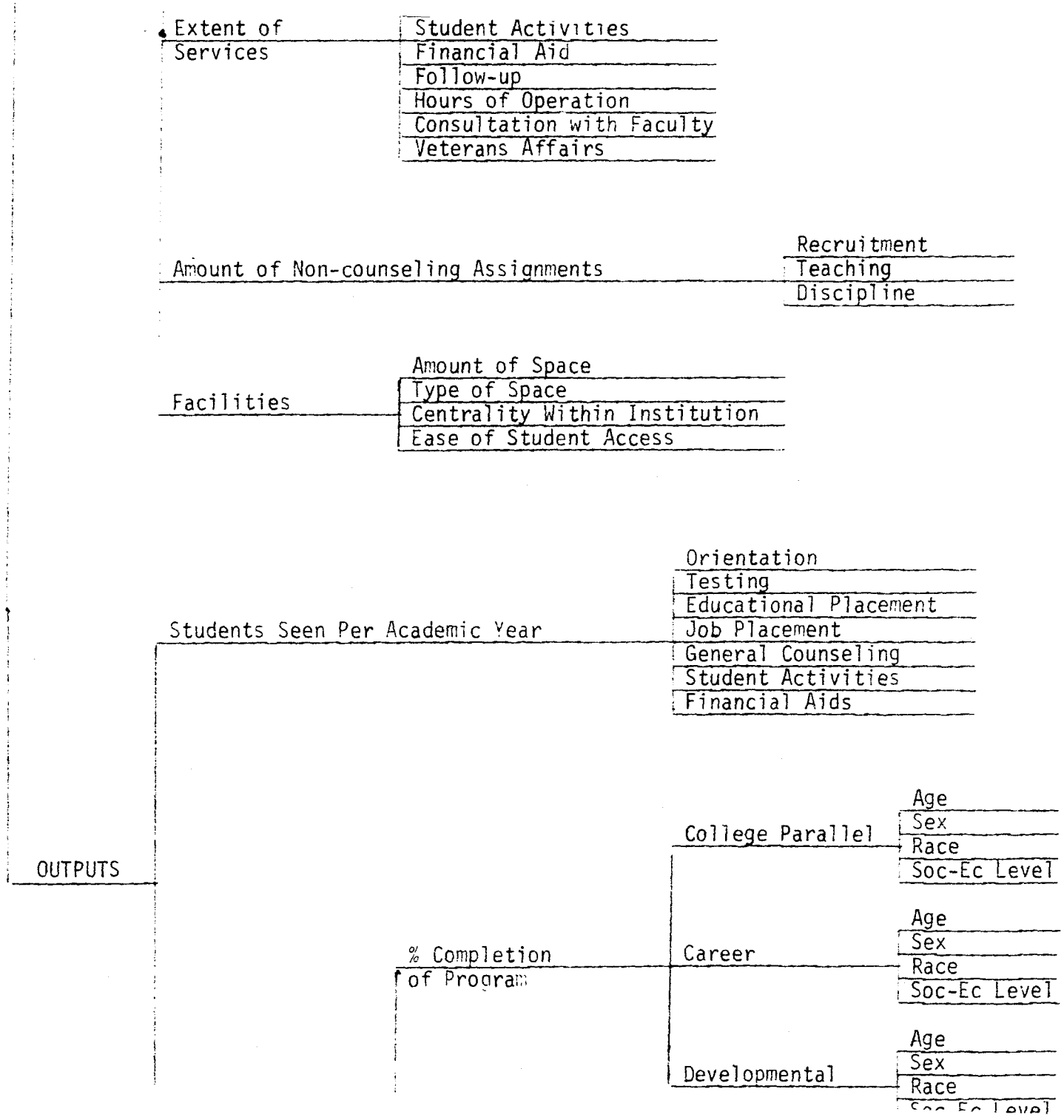
Testing
- Type
- Result-sharing with students

Extent of Services
- Educational Placement
- Job Placement
- General Counseling
- Student Activities
- Financial Aid
- Follow-up
- Hours of Operation
- Consultation with Faculty
- Veterans Affairs

Amount of Non-counseling Assignments
- Recruitment
- Teaching
- Discipline

Facilities
- Amount of Space
- Type of Space
- Centrality Within Institution
- Ease of Student Access

Orientation


Extent of Services
Student Activities
Financial Aid
Follow-up
Hours of Operation
Consultation with Faculty
Veterans Affairs
Amount of Non-counseling Assignments
Recruitment
Teaching
Discipline
Facilities
Amount of Space
Type of Space
Centrality Within Institution
Ease of Student Access
OUTPUTS
Students Seen Per Academic Year
Orientation
Testing
Educational Placement
Job Placement
General Counseling
Student Activities
Financial Aids
% Completion of Program
College Parallel
Career
Developmental
Age
Sex
Race
Soc-Ec Level
Age
Sex
Race
Soc-Ec Level
Age
Sex
Race

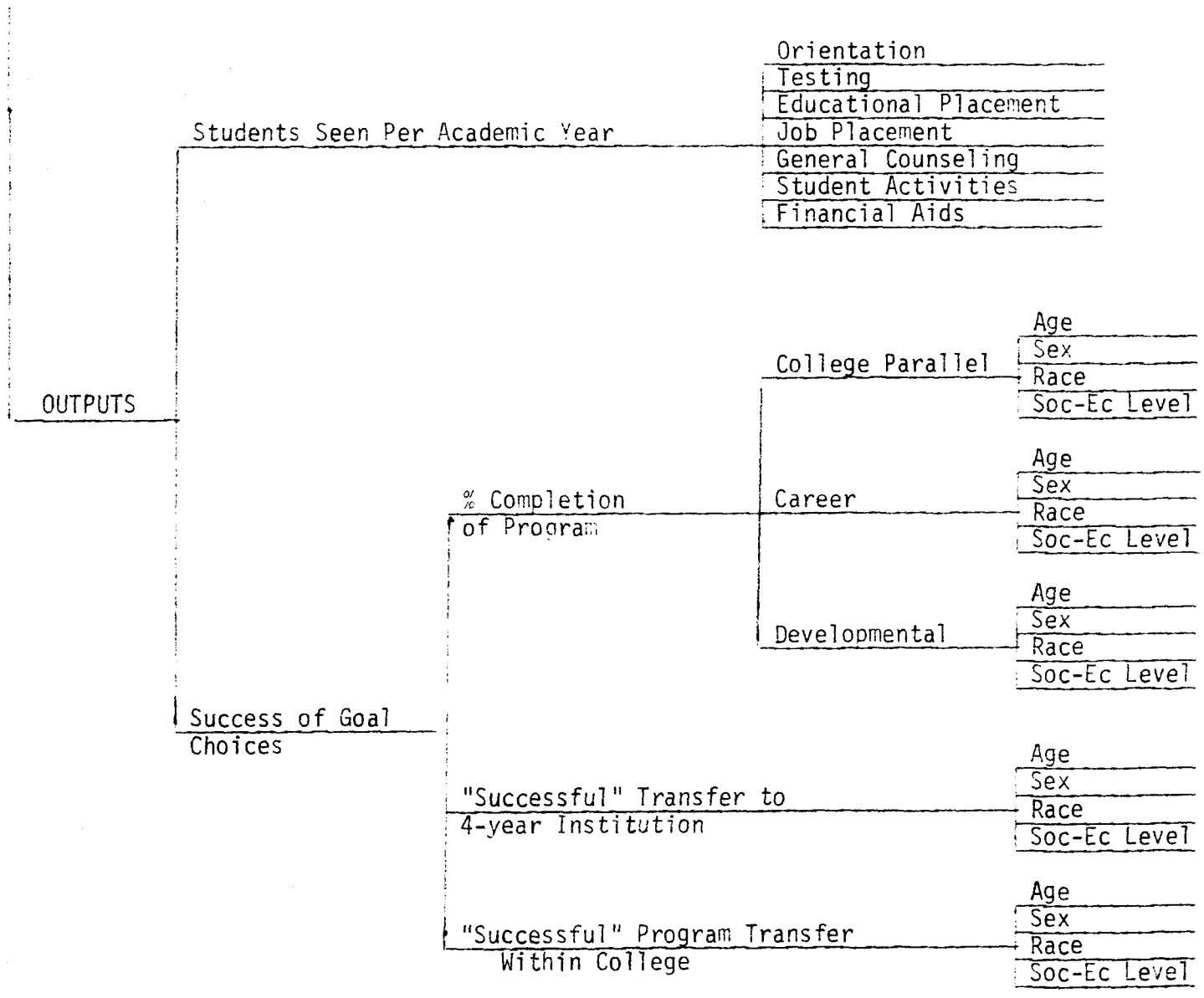


Figure 9: Guidance and Counseling

outputs. This research effort attempts to apply suggestions made by Land (111) thereby expanding the usual orientation for evaluation and assessment in education. The approach taken here places the costs and contributions of the community college within the total societal schema. That is, although the activity of evaluating institutions and systems of education is not unique, the consequences of findings derived from this type of research is intended to take on more significance.

There has been to this researcher's knowledge no attempt to specifically apply social indicator concepts to any subsystem within the educational system, nor for that matter, to the institution of education per se. The decision to select the community college as the initial linkage is based on the fact that community colleges possess what few other educational institutions do - a clearly stated purpose and specified goals that can be measured at the national, institutional, and programmatic level. This fact is seen to be significant since most writers indicate that specified goal statements are prerequisites for the development of any systems analysis effort. Thus, the stated goals of the community college, as presented in Figure #3, form the basis for the remainder of the model. The second reason for selecting the community college as the institution for study is based on the widespread agreement that this institution is specifically designed to contribute to the overall "quality of life" of this country.

The model was developed with the idea that assessment of the

overall community college goals as well as specific program goals is possible by use of the variables presented. For example, the accessibility of the institution for all persons is part of the college's raison d'etre. A measure of accessibility is reflected in the variable "enrollment/community ratio" which compares the total college district population in terms of age, sex, race, and socio-economic status with the student population along the same dimensions. Since it is possible that only one program area in the college is made "accessible" to all members of the community, enrollment/community ratios are included for all the six program areas, thus allowing for evaluation regarding the extent of the "open-door".

Evaluation of the overall community college goal of providing a "comprehensive program" can be effected by comparisons between programs within the same institution on such input variables as faculty salaries and the amount and type of facilities allocated to the different program areas. Information sought in this regard attempts to determine whether a single institution (or whether community colleges across the country) are emphasizing one program area to the detriment of another or whether institutional commitment is consistent across all program areas.

The model contains variables often used in other evaluative and descriptive studies of educational institution (as well as variables not so commonly used). This strategy has been adapted in order to clarify that the application of social indicator concepts adds new meaning to the traditional accumulation of educational data. Appli-

cation of the social indicator concept allows a traditional educational statistic to be conceived of as either an input variable, an output variable, or both an input and an output variable. For example, a student entering the College Parallel program of a community college is an input variable to that institution and to that program. The student transfer to a 4-year institution is an output variable for the community college and an input variable for the 4-year institution. Other inputs into the community college such as the student/faculty ratio are thought to affect the nature of the community college output. Thus the student/faculty ratio provides an example wherein one input variable (the students) interacts with another input variable (the faculty) to produce an output (graduate) of a particular quality. Further, the application of social indicator concepts imposes a prediction and systems approach to educational data collection that is necessary for a meaningful national accounting system.

The purpose of the model is to discover those output variables that directly and indirectly relate to specific input variables. Once these relationships are established, it is possible at both the local and national level to predict and to manipulate desired outcomes of the institution or the system. Since it is unknown at this point which variables interrelate, it is probable that many of the input and output variables included in this model will have no relationship to each other. The purpose of testing the model is to determine if in fact, the predicted relationships do exist.

As a final point, recognition must be given regarding the normative nature of the model. Arguments in anticipation of this cri-

ticism have been previously offered in this paper. It is sufficient here only to point out that the community college system is well established in this country. The further decisions to continue, discontinue or change the stated goals or methods of operation of the system should be responsibly based on an evaluation of whether the goals as currently stated are being met. If the goals are being met, the next step would be to determine if their effect coordinates with the goals of other educational subsystems and whether the combined effect of the total system of education contributes to the national goal for achievement.

The model as presented is an attempt to provide such an evaluation system. This research effort is conceived as a starting point.

Testing the Model

The college programs to be studied

The two program areas of College Parallel and Career Development have been selected as the focus of this research. These programs have been selected from the six areas depicted in Figure #3 because a major portion of institutional resources are directed toward their development and maintenance. Further, since the colleges selected for study began operation during the base year of this study (1968) or immediately prior to that year, it was expected that these programs would be more completely developed than the other four program areas and would therefore be more adequate sources for data collection.

Hypotheses to be tested

Four major hypotheses regarding the model as a useful instrument for determining social benefits derived from community college programs were presented in Chapter I. The viability of the model will be evaluated indirectly by testing a series of sub-hypotheses directly related to each major hypothesis. Since test of the model involves use of the null hypothesis, the major hypotheses are restated here in that form, as are the sub-hypotheses associated with them

Major Ho. 1 The model presented is not a feasible tool for visualizing direct input-output relationships between those resource variables going into specific program areas of a single community college and the results coming out of that program area.

To test this major hypothesis, the following sub-hypotheses will be tested:

Ho. 1.1 There is no significant relationship between student/faculty ratios in the College Parallel and Career Development programs and the number of students who complete these programs.

Ho. 1.2 There is no significant relationship between student/faculty ratios in the College Parallel programs and the number of students who apply from College Parallel programs to 4-year institutions.

Ho. 1.3 There is no significant relationship between student/faculty ratios in College Parallel programs and the number of students who transfer to 4-year institutions.

Ho. 1.4 There is no significant relationship between student/faculty ratios in College Parallel programs and the length of time students from College Parallel programs remain at 4-year institutions.

Ho. 1.5 There is no significant relationship between student/faculty ratios in Career Development programs and the type of initial job placement of Career

Development students.

Ho. 1.6 There is no significant relationship between student/faculty ratios in Career Development programs and the type of current job placement of Career Development students.

The variable of student/faculty ratio represents a traditional input measure offered by educators as criteria for determining the quality of an educational program. It is generally accepted that the lower the student/faculty ratio, the better the education offered. Program completion rates represent often-used output criteria for the value of educational programs. Since the intent of the College Parallel program is to prepare students for transfer to 4-year institutions, the number of students who apply and transfer to these institutions, and the length of time students remain at these institutions represent significant measure of the college as a "feeder" institution. Job placement, both initial and current, constitute output measures of the benefits derived by both the student and the community from the career training offered at the community college.

Major Ho. 2 The model is ineffective as a tool for evaluating the extent and direction in which community college goals are being achieved at the community college district level.

To test this major hypothesis, the following sub-hypotheses will be tested:

Ho. 2.1 There is no significant difference in the age, sex, race, and socio-economic distribution of students enrolled in College Parallel programs and the age, sex, race, and socio-economic distribution of the community college district.

Ho. 2.2 There is no significant difference in the age, sex, race, and socio-economic distribution of students enrolled in Career Development programs and the age, sex, race, and socio-economic distribution of the community college district.

This hypothesis attempts to determine the extent of college program accessibility to the various sub-groups residing in the community college district. Age, sex, race and socio-economic level are commonly used parameters for classification of sub-populations and community totals along these lines are readily available.

Major Ho. 3 The model is not an effective tool for determining if institutional emphasis on a single program exists at the local college level.

To test this major hypothesis, the following sub-hypotheses will be tested:

Ho. 3.1 There is no significant difference in the age, sex, race, and socio-economic status and number of high school graduates of students enrolled in College Parallel programs and the age, sex, race, socio-economic status and number of high school graduates of students enrolled in Career Development programs.

Ho. 3.2 There is no significant difference in the student/faculty ratios of College Parallel programs and the student/faculty ratios of Career Development programs.

Ho. 3.3 There is no significant difference in the salaries received by faculty in College Parallel programs and the salaries received by faculty in Career Development programs.

The quality of the inputs allocated to each program area provides the focus of these hypotheses. Differences in the amount and quality of resources (either student or faculty) directed into each of the program areas may provide reasons for findings that reflect differences

between the outputs of these programs.

Major Ho. 4 The model presented is not a useful tool for evaluating the extent and direction to which community college goals are being achieved at the national level.

To test this major hypothesis, the following sub-hypotheses will be tested:

Ho. 4.1 There is no significant difference among the three institutions in the age, sex, race, and socio-economic status of students enrolled in College Parallel programs.

Ho. 4.2 There is no significant difference among the three institutions in the age, sex, race, and socio-economic status of students enrolled in Career Development programs.

Ho. 4.3 There is no significant difference among the three institutions in the age, sex, race, and socio-economic status of students transferring to 4-year institutions from College Parallel programs.

Ho. 4.4 There is no significant difference among the three institutions in the age, sex, race, and socio-economic status of Career Development students currently holding jobs in the field in which they were trained.

The purpose behind these hypotheses is to determine whether the generalized statements being offered regarding the inputs and outputs of community colleges across the nation are based on similarities among the colleges. To this end, several of the parameters involved in assessing relationships that exist within individual institutions in previous hypotheses are used to determine the existence commonalities among the three colleges.

The base year

The Fall semester of 1968 was selected as a base year. Selection of this year allows a student sufficient time to enroll as a freshman in the College Parallel program at a community college, follow a program of full-time enrollment from the community college to a 4-year institution and graduate from that institution at the end of the Spring session, 1972. Since the literature (106, 107) reveals that the community college transfer students often suffer a "setback" upon transfer to a 4-year institution, thus delaying the "normal progression sequence" of a 4-year college education, an additional year was added to the anticipated date of graduation. If some students enrolled in 1968 did progress at a slower pace and graduate from the 4-year institution any time during the 1972-73 school year, the data necessary for this research would still be available. Allowing sufficient time for College Parallel students to transfer and graduate from a 4-year institution also allows enough time for a student enrolled in a Career Development program to graduate and enter the labor market. Thus, data necessary for evaluating the outputs of this program area would also be available.

Sample selection

Selection of the student sample posed somewhat of a problem because of the large differences in the enrollments of the three schools involved. The method of systematic sampling was utilized. Forty full-time students (students enrolled in 12 or more hours) from each

of the two program areas of College Parallel and Career Development from each of the three institutions was drawn for a total student sample size of 240. A student was included in the sample if he or she was enrolled in 12 or more hours at the third week of the semester regardless of whether the student reduced his or her course-load during the semester and thereby lost full-time student status.

A faculty sample was also selected from each institution. A faculty member was included in the sample if he or she taught half-time or more in either the College Parallel or Career Development program.

Collection of data

Collection of data required site visits to each institution by the researcher. Prior to visiting the colleges, two data sheets were developed, one for students and one for faculty, in order to facilitate and guide data collection (see Appendix).

The student data sheet is divided into three sections: the first is a general section that applies to all students enrolled in the college, the second section (items #14 through #16) applies to those students who were enrolled in the College Parallel program. The third section (items #17 through #21) applies to those students enrolled in the Career Development program. Although item #5 of the student data sheet is labeled SES (socio-economic status) its reference in this study is only to the sources of financial assistance available to the student during his or her enrollment at the community college. It is recognized that this information provides only an indication of socio-

economic status and does not completely reflect the intent of the variable as presented in the model.

Data for item #1 through #13 were obtained from information in the students' official record held by the college (with the exception of items #5 and #11). The remainder of the data sheet was completed through telephone conversations between the researcher and, in most instances, the parent of the student. The method of telephone survey was used in order to derive 100% sample return from a small sample rather than to base findings on a large sample n with fewer data returns.

Data on faculty included information on the age, sex, race, salary and teaching assignment. These data were also obtained at the time of the site visit. Information regarding the populations served by the community college was obtained from the 1970 Census Report.

Treatment of the Data

The various statistical treatments used in this study are dictated by the nature and extent of the data collected. Only two program areas at three institutions are under consideration. Part of the information sought relates to a comparison between college district populations and college enrollments. In these instances, the chi square goodness of fit test is applied using the .05 confidence level. In other instances, comparisons between the two program areas within a single institution and comparisons of college programs among the

three colleges are the focus on investigation. In these instances the chi square test of independence at the .05 level of confidence is used. The only exception to this procedure occurs in the analysis of faculty salaries. Data were, in this case, transferred to key-punched IBM cards and tests were computed for the .05 level of confidence.

In some instances the data do not lend themselves to statistical analysis and the data are therefore presented in the form of histograms and frequency counts.

An attempt will be made in this study to determine if a significant relationship exists between the following input and output items: student/faculty ratios in the College Parallel program and the number of students in that program that apply and transfer to 4-year institutions and the length they stay at the receiving institution; student/faculty ratios in the Career Development programs and the number of students in that program whose initial and current job placement is consistent with their training at the community college. The model will be judged as a useful tool if such relationships can be shown to exist, e.g. if higher student/faculty ratios are related to lower completion rates, lower transfer rates, fewer graduates from 4-year institutions, and fewer instances where initial and current job placement are consistent with college training.

Further an attempt will be made to determine if the enrollment in either or both the College Parallel and Career Development programs reflect the community college district population in terms of age,

race, and socio-economic level. The model will be judged as a viable tool for determining the extent and direction of community college benefits if such comparisons can be made.

Comparisons of the age, sex, race, socio-economic and previous educational level of students enrolled in College Parallel and Career Development programs as well as salary levels of faculty in each program area allow for determining if the model contains useful variables for pointing out the existence of program area emphasis within individual colleges.

The above comparisons reflect an orientation toward "within college" evaluation. Analysis of selected input and output variables across the three institutions in order to determine if similarities and differences among community colleges can be made visible by use of model parameters. If such comparisons can be made, the model will be considered an adequate tool for estimating differential achievement of community college goals at the national level.

CHAPTER IV. FINDINGS

The report of the findings of this research is arranged into two major sections; the first section includes general descriptive data on the three colleges as they existed in the Fall of 1968; the second section includes the data and their analysis. The sequence of data analysis follows the order in which the major hypotheses were presented in Chapter I. In each instance the major hypothesis and the related sub-hypotheses are presented. The relevant data are presented, followed by concluding remarks regarding the major hypothesis under consideration at that point.

There are two broad aspects to the findings of this study. They reflect the two major categories of scientific investigation, generating hypotheses and testing hypotheses. The findings related to the first major hypotheses are concerned with the generation of hypotheses. Specifically, the data analysis related to this major hypothesis is concerned with determining whether trends can be established between the effect of an input variable (student/faculty ratio) on several output variables. The existence of trends would provide the basis for generating more specific hypotheses and for more rigorous study involving many colleges or involving time-series studies on a few colleges.

Major hypotheses 2, 3, and 4 represent the scientific category of testing hypotheses. Parametric and non-parametric statistics are used to reject or fail to reject the major and

sub-hypotheses.

General Descriptive Data

Harper College

William Rainey Harper Community College district is located in Cooke and Lake counties, Illinois. The college serves the townships of Elk Grove, Wheeling Palantine, Schaumberg, Barrington, and Cuba. The college opened its doors for the first time in September, 1967. During its first year of operation, classes were held in two high schools located within ten miles of each other and within fifteen miles of its present location. In the Fall of 1968, another high school was added and for that year, classes were held in these three high schools from 4:30 p.m. until 10:30 p.m. Monday through Thursday.

In the Fall of 1968, the student population numbered 3,735. Approximately half the students were enrolled full-time. Many of the students enrolled at Harper College were transfer students from 4-year colleges and universities and often enrolled at Harper on academic probation from their original school.

Harper Community College reflects the orientation of a 4-year institution to a greater degree than any of the three community colleges visited by this researcher. The cover of its 1968 catalogue is titled "William Rainey Harper College" (emphasis mine) and the sweatshirts available for sale in the bookstore in 1973 are printed "Harper College". The faculty hold the same ranks as found at 4-year institutions (instructor, assistant professor, associate professor, and

professor) and are referred to by their rank. The college has three tuition schedules; residents (students living within the college district) paid $8.00 per semester hour in 1968, non-residents (students residing in Illinois but outside the college district) paid $43.50 per semester hour, and out-of-state students paid $55.00 per semester hour. The 1968 application fee was $10.00, the activity fee was $10.00, the graduation fee was $10.00, laboratory fees were $5.00, a late registration fee was $5.00, and the charge to change a course was $3.00.

Harper College in 1968 (as well as today) offered three degrees: the Associate in Arts (A.A.), the Associate in Science (A.S.), and the Associate in Applied Science (A.A.S.). The A.A. and A.S. degrees are primarily for students desiring to transfer to 4-year institutions. The A.A.S. is primarily for those in two year career programs. A non-degree Certification Program also offered training for job entry. Graduation requirements were well-specified: a minimum of 60 semester hours of credit, a minimum grade point of 2.0, two hours of credit in physical education, satisfactory completion of Political Science 201, a math standard score of 14 or higher on the ACT test, enrollment at Harper College during the semester in which graduation requirements are completed, and fulfillment of the "degree group requirements" consisted of Communication Skills, Social Sciences, Science or Mathematics, and Humanities. Every student enrolled in one of the degree programs listed above had to complete at least six hours from each of the first two groups, eight hours from the third

group (A.S. degree candidates had to complete 20 semester hours from this group), and at least six hours in the fourth group.

In 1968 the college offered fourteen degree programs in the vocational area, two certificate programs and college parallel courses in eight areas of study including business, education, engineering, humanities, medicine, natural sciences, mathematics, and social sciences.

Harper College currently occupies a several acre site in Palantine township. The master plan, devised in 1968, calls for a total of twelve buildings and 10,000 students by 1975.

Cuyahoga Community College (Tri-C)

Cuyahoga Community College is made up of two campuses, the Metropolitan Campus which is located in the St. Vincent area of downtown Cleveland (and which is the focus of this study) and the Western Campus located in the Parma-Parma Heights area. The Metro campus began occupying its facilities in the Fall of 1968. The total enrollment for the college for the Fall quarter of 1968 was 14,889. Of these, 9,894 students were enrolled at the Metro Campus. Approximately 33% of the students were enrolled on a full-time basis (this is a considerably lower percentage than the other two colleges visited).

Two degree programs were offered at Tri-C; an Associate in Science (A.S.) and an Associate in Arts (A.A.). Unlike Harper College, the A.S. is not intended as a college transfer program. It is com-

parable to Harper's Associate in Applied Science degree and is intended to prepare students to enter the labor market directly upon graduation from the college.

Unlike the other two colleges visited, Tri-C's emphasis appears to be (at least in terms of academic offerings) in the area of Career Development. Within the A.S. degree program, twenty-one vocational-technological majors were offered in 1968. The offerings included a degree in building construction, dental hygiene, electrical-electronic technology, fire technology, industrial supervision, law enforcement, library technology, mechanical technology, medical assisting, nursery school assisting, nursing, and business. Within the business curriculum there were ten areas of specialization from a degree in business with a concentration in accounting to a degree in business with a concentration in wholesaling. Tri-C has by far, the most developed and extensive Career Development program of the three colleges visited by this researcher.

The College Parallel program was not as extensive as at the other colleges in this study. Four university parallel majors were offered in business administration, arts and sciences, engineering, and education.

Tri-C considers itself a comprehensive community college and states that there are requirements within the arts and sciences curriculum for Career Development students. However, the requirements are rather "loose" and are not specified in the student catalogue.

Another distinction between Tri-C and the other two schools

visited is the attendance record of the students enrolled. Tri-C is definitely an "easy in - easy out" institution. The students at Marshalltown and Harper were usually enrolled in consecutive semesters or quarters until graduation. If they left the college prior to graduation, they usually did not return. Students at Tri-C, however, maintain a sporadic attendance rate. In 1968, for example only 50% of the enrollment was classified as "continuing students", 40% of the students were new that year, and 10% were classified as "returning students". As a consequence, it takes the "average" Tri-C student three years to graduate.

Marshalltown Community College

In the Spring of 1966, Marshalltown Community College broadened its goals and objectives from its original founding purpose to include vocational and technical education, student personnel services, community services, and vocational education for persons who have academic, socio-economic or other handicaps. It was at this point that the college became a "community college". Marshalltown Community College is part of a state system of community colleges and vocational-technical institutes. It is one of two institutions of higher education in Merged Area VI Community College District in Iowa. Area VI includes twenty-two high school districts within Hardin, Marshall, Poweshiek, and Tama counties. It serves students whose residences are within Area VI as well as outside the Area. Its facilities and programs are most readily accessible to the students

of Marshalltown and the surrounding area of a 35 mile radius, thus a large portion of the student body comes from this central Iowa area.

Marshalltown Community College offers three degree programs: an Associate in Arts (A.A.), an Associate in Science (A.S.), and an Associate in Applied Science (A.A.S.) and non-degree Certificate Programs in dental assisting, auto mechanics, machine trades, and clerical training. The A.A. and A.S. degree programs are designed as College Parallel; the A.A.S. and Certificate programs are considered career programs.

The Fall 1968 enrollment was 1,148. Eighty-six percent of the student body was enrolled as full-time students. All but 100 of the students were enrolled in the College Parallel programs. Of the 100 students in Career Development programs, 61 were enrolled in the A.A.S. programs and 39 were enrolled in the Certificate programs. Most of the students enrolled in the Fall of 1968 were first-year students, 68% of the students were residents of Area VI, 31% of the student body came from outside the area.

Students enrolled in the A.A. program were required to complete thirty hours of general studies, students enrolled in the A.S. programs were required to complete seventeen hours of general studies, and students enrolled in the Certificate programs had no general studies requirements.

The facilities used by Marshalltown Community College consisted of six buildings, three of which comprised the "main campus" and three

which were considered "off campus". One of the off-campus buildings, the Vocational-Technical Building, housed the programs offered in the A.A.S. and Certificate programs. This separation of facilities served to separate the student body population on the basis of curriculum. This situation will soon be remedied. In 1968, 200 acres of land was purchased south of Marshalltown for a new campus. As of 1973, facilities have been built to house the vocational-technical programs. The college administration plans to move the rest of the student body to that site within the next year.

Admission to college

According to Harper's 1968 student catalogue, all high school graduates were eligible for admission. Non-graduates 18 years of age or over could be admitted if they "demonstrate the capacity and maturity to benefit from the program". Admission to Cuyahoga Community College was open to all high school graduates as well as to non-high school graduates who were 21 years of age or older who were able to "demonstrate capability of college level performance". Persons under 21 years of age who had not completed high school were generally not considered eligible for admission to Tri-C. Students seeking an A.A. degree or an A.S. degree from Marshalltown were required to meet essentially the same entrance requirements as those in other institutions of higher education in the state of Iowa. For unconditional admission, a student must have graduated from an accredited high school. Persons beyond the age of compulsory high school attendance who did not have a high school diploma could apply for conditional

admission to this regular program or could be admitted to the "basic skills" program. Any person beyond the age of compulsory school attendance could be admitted to a non-transfer training course regardless of whether or not she or he held a high school diploma.

Data Analysis

Major Ho. 1

The model presented is not a feasible tool for visualizing the existence of relationships between those resource variables going into specific program areas of a single community college (inputs), and the results coming out of that program area (outputs).

To test this major hypothesis, the following sub-hypotheses were tested:

Ho. 1.1 There is no relationship between student/faculty ratios in the College Parallel and Career Development programs and the number of students who complete these programs.

Ho. 1.2 There is no relationship between student/faculty ratios in College Parallel programs and the number of students who apply from College Parallel programs to 4-year institutions.

Ho. 1.3 There is no relationship between student/faculty ratios in College Parallel programs and the number of students who transfer from College Parallel programs to 4-year institutions.

Ho. 1.4 There is no relationship between student/faculty ratios in College Parallel programs and the length of time students from College Parallel programs remain at 4-year institutions.

Ho. 1.5 There is no relationship between student/faculty ratios in Career Development programs and the type of initial job placement of Career Development students.

Ho. 1.6 There is no relationship between student/faculty ratios in Career Development programs and the type of current job placement of Career Development students.

Rigorous statistical analysis of the above statements is not possible because this pilot study produced data on only three schools and used only one year as an information base. Consequently the data for each of the two program areas acquired are presented in table and histogram form to show the existence and/or non-existence of trends regarding the relationships of interest at each of the three institutions. Table 2 and Figure 10 represent the comparison between student/faculty ratios in the College Parallel programs for each of the three colleges. The schools are ordered in the table and on the graph according to size of student/faculty ratio.

Table 2. Comparison of student/faculty ratios and College Parallel completions

College	Student/faculty ratio in College Parallel program	College Parallel completions (n=40 per school)
Marshalltown	23:1	25 students
Tri-C	41:1	23 students
Harper	66:1	22 students

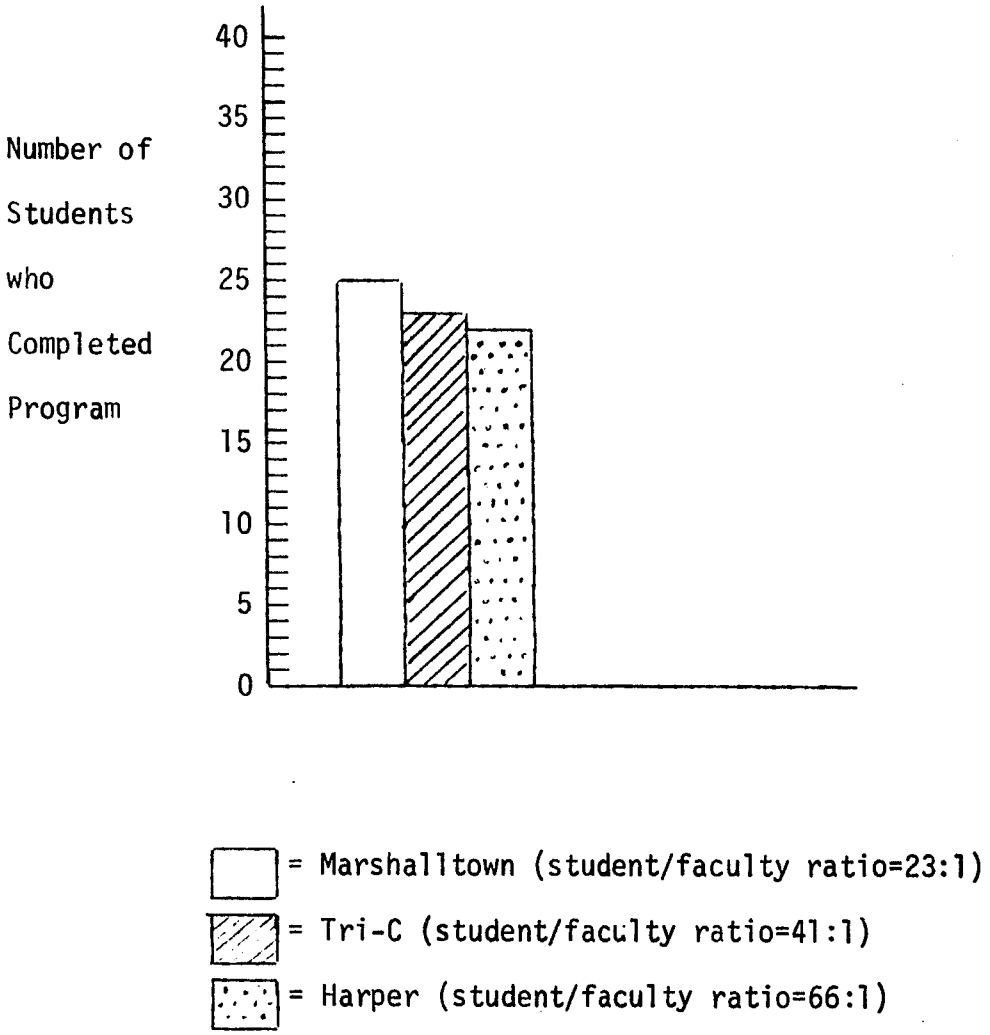


Figure 10. Student/Faculty Ratios and student completions for College Parallel Program.

Table 3 and Figure 11 represent the comparison between student/faculty ratios in the Career Development programs for each of the three colleges.

Table 3. Comparison of student/faculty ratios and Career Development completions

College	Student/faculty ratio in Career Development program	Career Development completions (n=40 per school)
Marshalltown	6.25:1	25
Tri-C	14:1	22
Harper	15:1	13

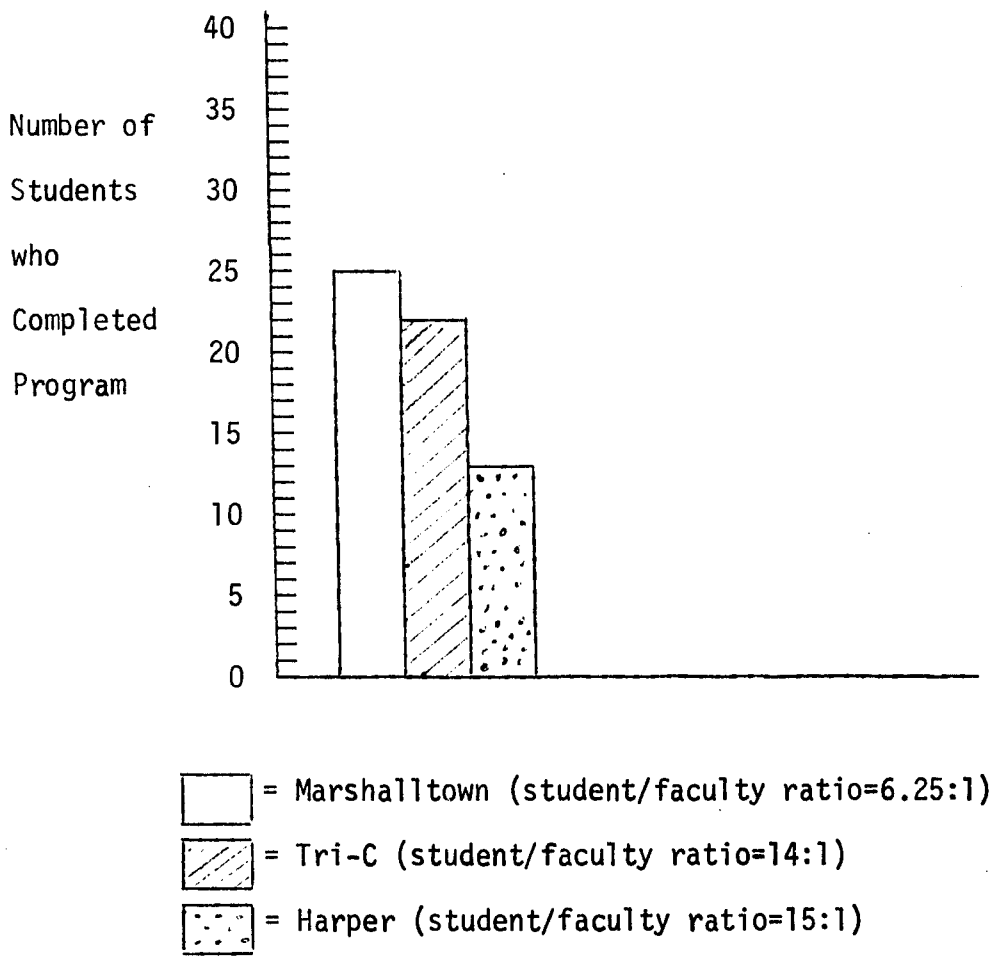


Figure 11. Student/Faculty Ratios and student completions for Career Development

Tables 2 and 3 and Figures 10 and 11 show that as student/faculty ratios increase in both program areas, there is a slight decrease in the numbers of students who complete the community college program. This inverse relationship appears to be greater in the Career Development program than in the College Parallel program.

Table 4 and Figures 12a and 12b reveal no apparent relationship between student/faculty ratios in the College Parallel programs and the number of students who apply to 4-year institutions. There does appear to be a relationship between student/faculty ratios and number of students who transfer to 4-year institutions and number of students who graduate from 4-year institutions in that as the student/faculty ratio increases, the number of students who transfer and graduate decreases. There is no consistent trend in the comparisons between student/faculty ratios and length of time transfer students remain at 4-year institutions.

Table 4. Comparison of student/faculty ratios with student post-college behaviors

College	Student/faculty ratio in C.P. program	No. students who apply to 4-year institution	No. students who transfer to 4-year institution	Length of time at 4-year institution				
				1 yr.	2 yrs.	3 yrs.	4 yrs.	graduate
M'town	23:1	29	23	5	4	0	0	15
Tri-C	41:1	21	21	4	1	0	2	14
Harper	66:1	26	20	1	4	2	2	10

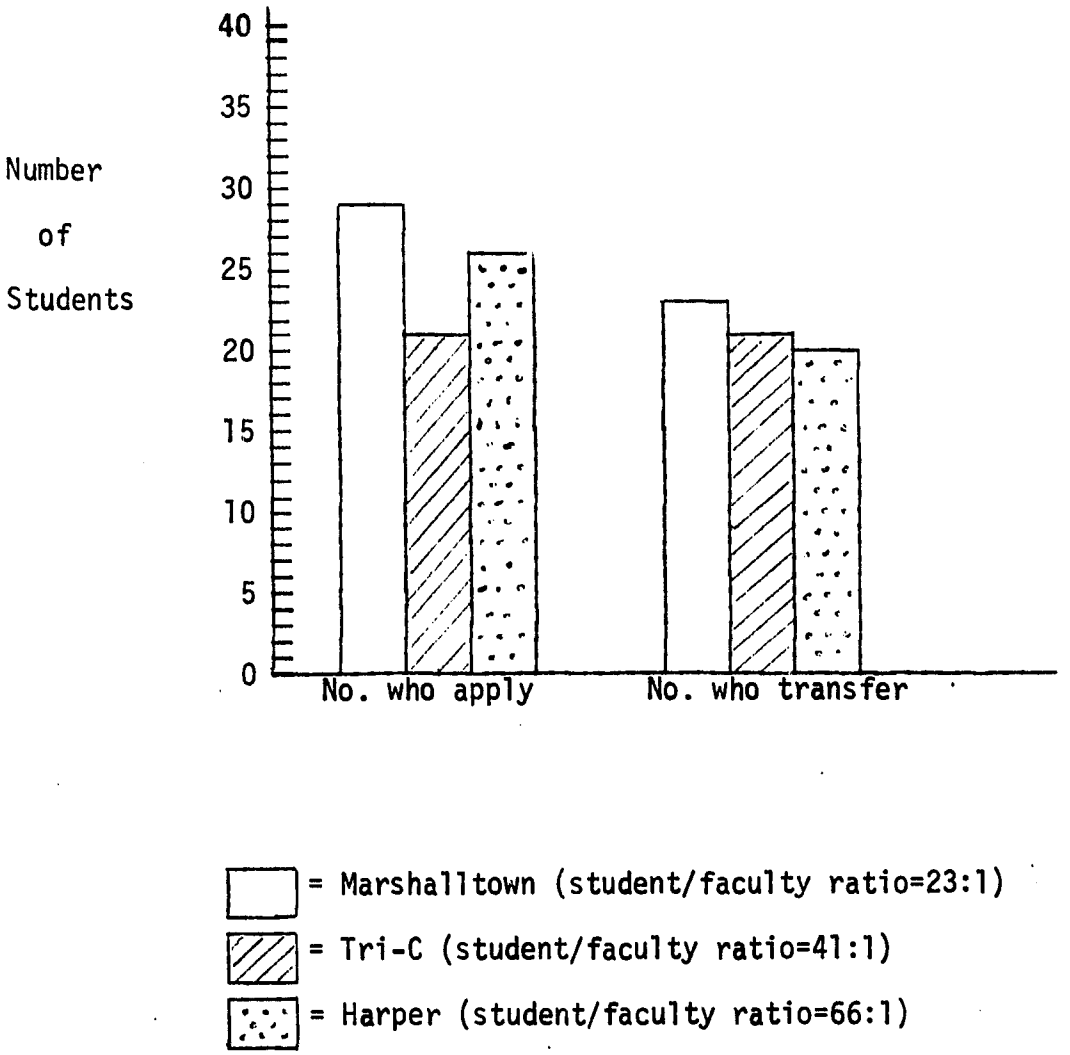


Figure 12a. Student/faculty ratios and number of students who apply and transfer to 4-year institutions

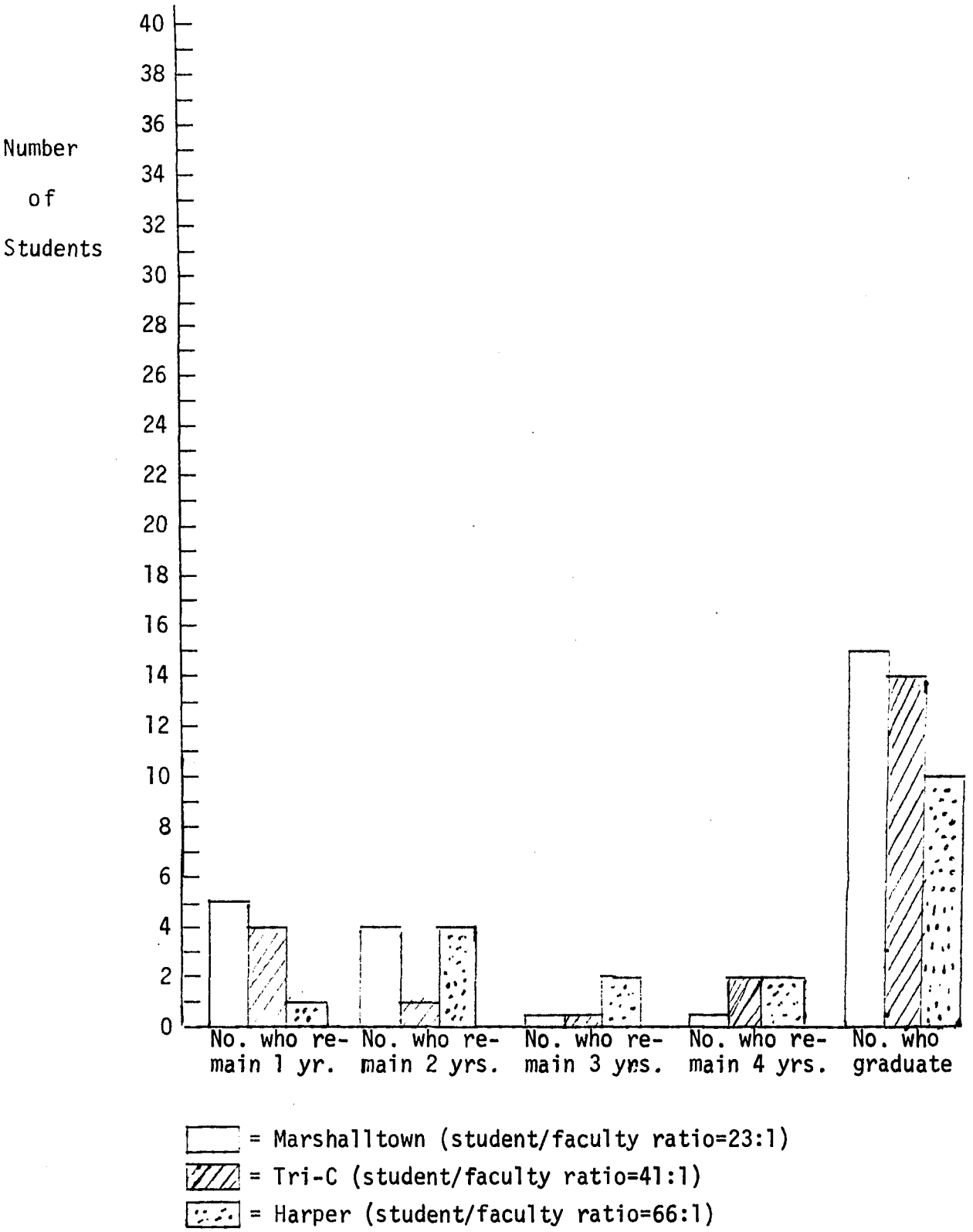


Figure 12b. Student/faculty ratios and student length of stay at 4-year institutions

Table 5 and Figure 13 reveal no apparent relationship between student/faculty ratios in Career Development programs and the type of job placement that occurs immediately after leaving the community college. The same situation exists in relation to current job placement as shown in Table 6 and Figure 14.

Table 5. Comparison of student/faculty ratios in Career Development programs with initial placement of Career Development students

College	Ratio	Employed same area as training	Further training in same area as training	Employed different area from training	Training in different area from training	Military	Unemployed
M'town	6.5:1	16	1	10	1	12	0
Tri-C	14:1	17	9	10	1	2	1[a]
Harper	15:1	8	10	14	2	6	0

[a] Married female with children.

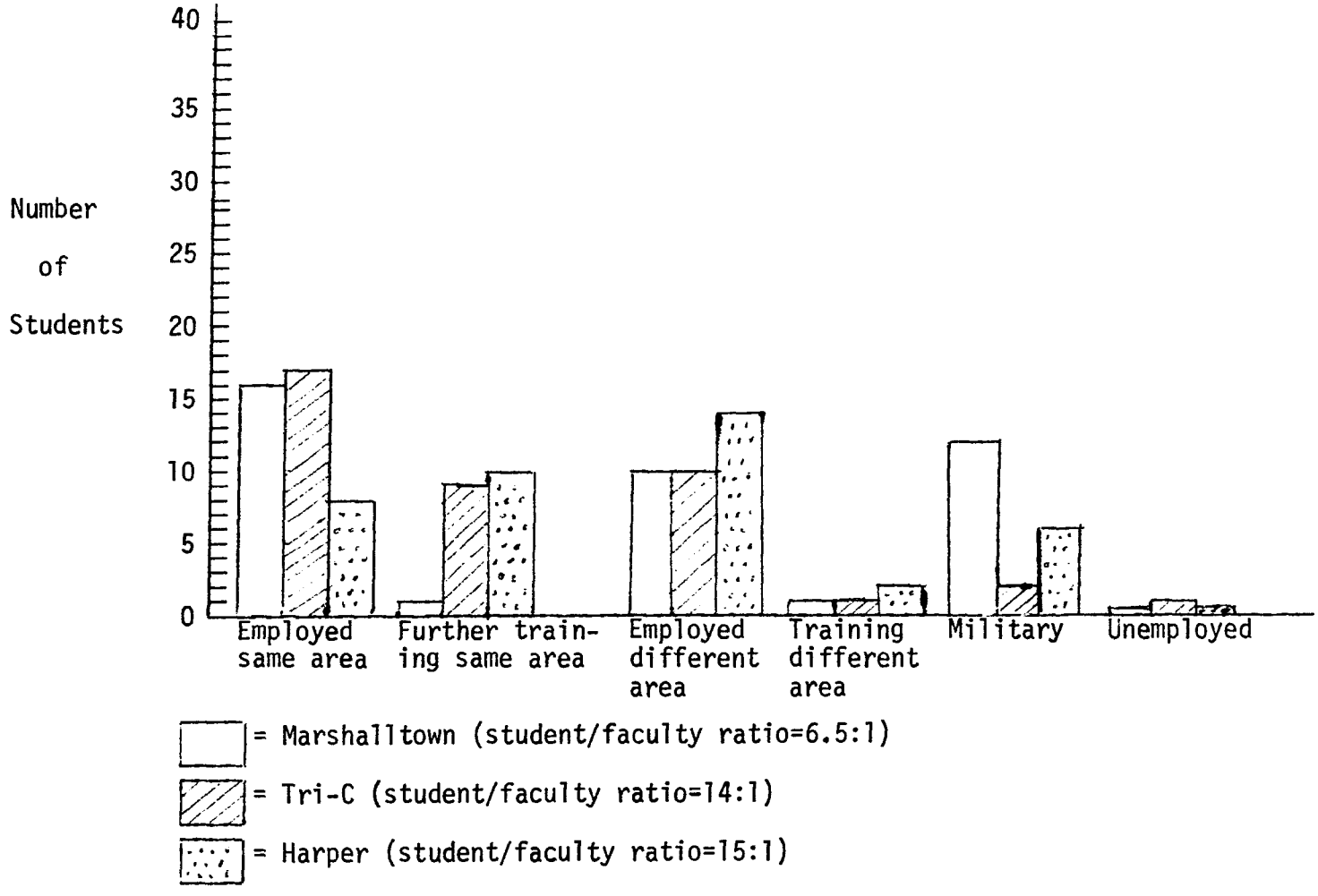


Figure 13. Student/faculty ratios and initial placement of Career Development students

Table 6. Comparison of student/faculty ratios in Career Development programs with current placement of Career Development students

College	Ratio	Employed same area as training	Further training in same area as training	Employed different area from training	Training in different area from training	Military	Unemployed
M'town	6.5:1	12	3	18	0	1	6[a]
Tri-C	14:1	18	3	12	1	1	5[b]
Harper	15:1	8	4	22	1	1	4

[a] 3 are married females with children.
[b] 1 is married female with children.

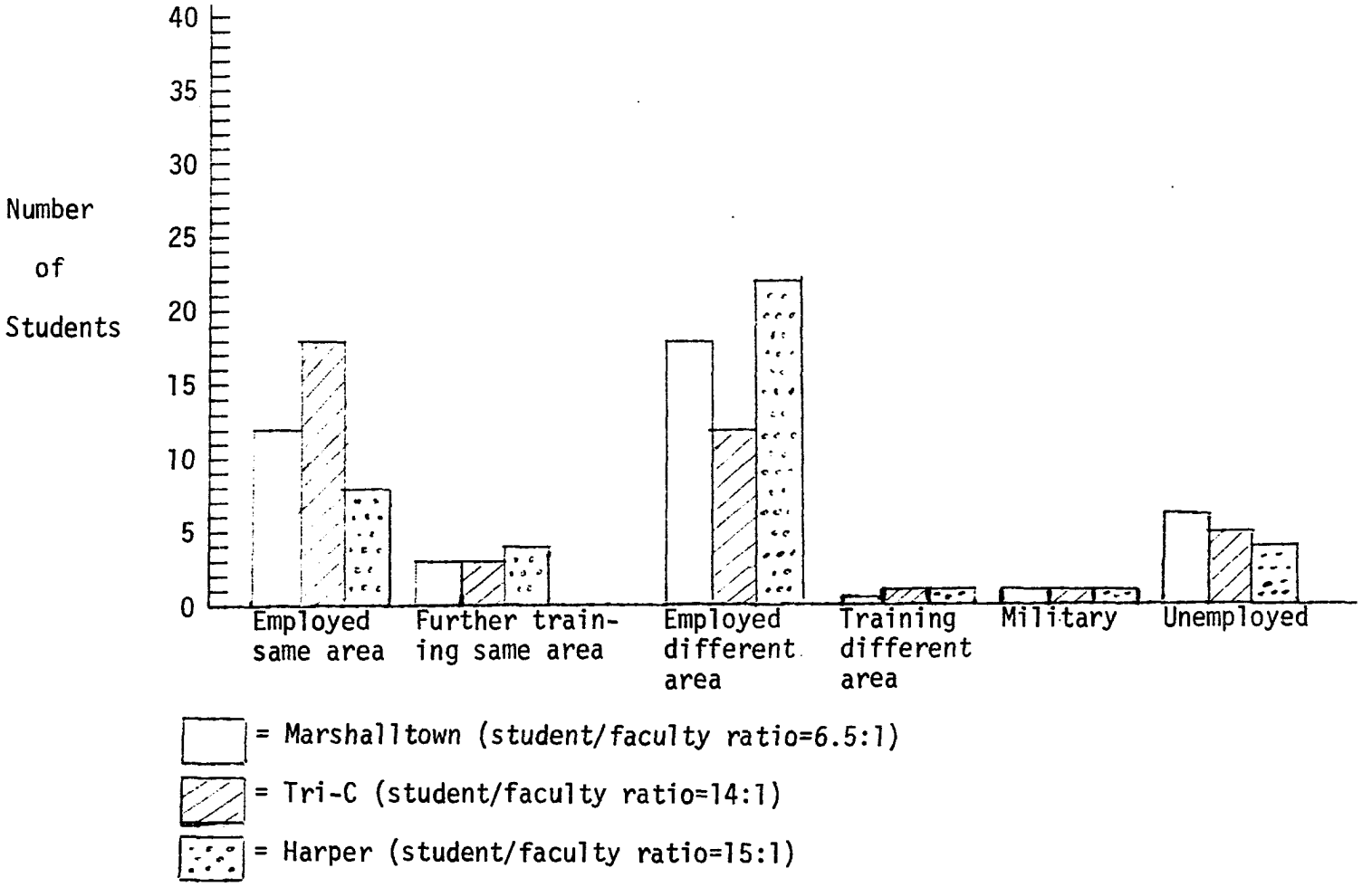


Figure 14. Student/faculty ratios and current placement of Career Development students

The model suggests a relationship between student/faculty ratios and the output variables presented above. A summary of the findings related to sub-hypotheses 1.4 through 1.6 is presented in Table 7.

Table 7. Summary of findings for Ho. 1.1 through 1.6

Sub-ho.	College Parallel Program	Career Development Program
1.1	reject null hypothesis	reject null hypothesis
1.2	partially reject null hypothesis	(not applicable)
1.3	reject null hypothesis	(not applicable)
1.4	partially reject null hypothesis	(not applicable)
1.5	(not applicable)	partially reject null hypothesis
1.6.	(not applicable)	partially reject null hypothesis

Examination of the data provide some evidence to support the rationale that lowering student/faculty ratios in these program areas will affect the immediate and the future behaviors of students in terms of meeting the program goals of the college. The data partially reject major hypothesis 1 in its null form. The model does show the existence of possible trends between the input variables of student/faculty ratio and the output variables that reflect direct benefits to students of the academic training they receive at the communi-

ty college.

Major Ho. 2

The model is not effective as a tool for evaluating the extent and direction in which community college goals are being achieved at the community college district level.

To test this major hypothesis, the following sub-hypotheses were tested:

Ho. 2.1 There is no significant difference in the age, sex, race, and socio-economic distribution of students enrolled in College Parallel programs and the age, sex, race, and socio-economic distribution of the community college district.

Ho. 2.2 There is no significant difference in the age, sex, race, and socio-economic distribution of students enrolled in Career Development programs and the age, sex, race, and socio-economic distribution of the community college district.

In order to test these hypotheses, it was first necessary to determine the age, race, sex, and socio-economic distributions for the community college districts involved in this study. The percentage rates for each of the above parameters at the district level provided the basis for determining the expected distributions in each of the two college programs under study for a sample of 40 students.

Marshalltown Community College District

The following data were drawn from the Summary Manpower Indicators for CAMPS Area VI provided by the Office for Planning and Programs and is based on the 1970 Bureau of Census data.

Total population The total population for Iowa Area VI in 1970 was 102,274.

Racial distribution The racial distribution for Iowa Area VI was 98.8% Caucasian and 1.2% non-Caucasian. The number of students expected in each program area based on a sample of 40 students is 39.5 Caucasian and .5 non-Caucasian.

Socio-economic distribution 33.4% of the district population was classified as poverty or "near-poor" (annual income of $3,000.00 per year); 65.1% of the district population was classified as middle income (annual income of $3,000.00 to $15,000.00); and 1.5% of the district population was classified as high income ($15,000.00 plus annual income). The number of students expected in each program area was: high income: 0.6, middle income: 26.04, and low income 13.36.

As previously stated, item #5 on the Student Data Sheet is only an "indication" of student socio-economic level. In order to compare data collected with the socio-economic breakdown of the district population, students were assigned to a socio-economic level on the following basis: students who received no financial assistance from home and did not live at home were classified as low income; students who received financial assistance from home or who lived at home and who provided part of their own college expenses either through employment or loans were classified as middle income; students who were not employed either part-time during the school year or during the summer and who lived at home were classified as high income.

Sex distribution Of the population 17 years of age and older, 49.9% was male and 52.1% was female. The number of students expected

in each program area was 19.16 male and 20.84 female.

Age distribution 33.6% of the total district population was 17 years of age or below, 31.2% of the district population was 18 to 45 years of age, and 35.2% was 45 years of age or older.

Since the college is designed to serve the district population of post-high school age, a more complete analysis of this age range is provided in Table 8. Also included in the table are the number of students by age expected in each college program based on the district percentage rates for each age category and a sample of 40 students, and the frequencies actually observed in each college program.

Table 8. Marshalltown: District and college distributions by age

Age groups	Percentages of district population	No. of students expected in each program (based on n=40)	No. observed in College Parallel program	No. observed in Career Development program
18-24	15.0%	6.0	38	38
25-34	16.7%	6.6	2	2
35-44	15.2%	6.0	0	0
45-54	16.6%	6.6	0	0
55-64	15.6%	6.2	0	0
65 and over	20.9%	8.4	0	0

Marshalltown findings

The test of the sub-hypotheses was accomplished by use of the chi square goodness of fit test. Comparisons were made between the college sample for each program area and the college district population param-

eters presented. Yates correction for continuity was applied to data on race and sex.

Comparisons of observed and expected frequencies based on distributions by sex reveal a chi square value of 6.063 for the College Parallel program and a chi square of 39.136 for the Career Development program. Since these values are greater than the table value of 3.841 for one degree of freedom at the .05 level of confidence, null hypotheses 2.1 and 2.2 regarding sex distribution are rejected. Both the College Parallel and Career Development programs enrollments at Marshalltown fail to reflect the sex distribution of the district. The data regarding the enrollment by sex points out the extreme under-representation of females (7) in the Career Development program.

A comparison of observed and expected frequencies based on socio-economic status of students in the College Parallel and Career Development programs reveals chi square values of 151.116 and 7.015 respectively. Since these values are greater than the table value of 5.991 for two degrees of freedom at the .05 confidence level, null hypotheses 2.1 and 2.2 regarding socio-economic distribution are rejected. The program enrollments at Marshalltown do not reflect the socio-economic distribution of the district. The College Parallel data reflects the significant under-representation of middle income students in favor of high income students.

Statistical examination of data based on race would be of dubious validity since the district population provided an expected non-Caucasion frequency of less than 5. There were no non-Caucasians enrolled

in either of the college programs at Marshalltown. Since the expected enrollment of non-Caucasians was .5, the college does reflect the district in regard to racial distribution and null hypotheses 2.1 and 2.2 regarding race are not rejected.

Statistical comparison of student enrollment and community population based on age is unnecessary since several student age categories contain no observed frequencies. The Marshalltown student sample reveals enrollments concentrated in the 17-24 age range (38 students in each of the programs) and only a few students in the 25-34 age range. The College Parallel sample contained no students over 30 years of age and the Career Development program contained only one student older than 30. It is obvious that the college programs at Marshalltown do not reflect the age distribution of the district. Null hypotheses 2.1 and 2.2 regarding age are rejected.

A summary of the Marshalltown findings related to sub-hypotheses 2.1 and 2.2 are presented in Table 9.

Table 9. Summary of Marshalltown findings for Ho. 2.1 and 2.2

Sub-ho.	College Parallel Program	Career Development Program
2.1 and 2.2 (age)	reject null hypothesis	reject null hypothesis
2.1 and 2.2 (sex)	reject null hypothesis	reject null hypothesis
2.1 and 2.2 (race)	null hypothesis not rejected	null hypothesis not rejected
2.1 and 2.2 (socio-economic level)	reject null hypothesis	reject null hypothesis

Cuyahoga Community College District (Tri-C)

The following demographic data were obtained from the 1970 Bureau of Census Handbook.

Total population The total population of Cuyahoga county in 1970 was 1,721,300.

Racial distribution The racial distribtuion of the district was 81.5% Caucasian and 18.5% non-Caucasian. Based on this distribution and a sample size of 40 for each program area, it was expected that student enrollments would include 32.6 Caucasian and 7.4 non-Caucasian in each program area.

Socio-economic distribution 50.2% of the district population was classified as poverty or near-poor (annual income of $3,000.00 or less); 44.5% of the population was classified as middle income (annual income of $3,000.00 to $15,000.00); and 5.3% of the population was

classified as high income (annual income of $15,000.00 or more). Based on these percentages, it was expected that of the students sampled, 2.12 would fall in the high income category, 17.8 would fall in the middle income category, and 20.08 would fall in the low income category.

Sex distribution Of the population 18 years of age and older, 46.3% was male and 53.7% was female. The expected frequencies in each program area were 18.52 male and 21.48 female.

Age distribution 33.2% of the district population was 17 years of age or below, 34.0% was 18 to 45 years of age, and 32.8% was 45 years of age or older. Again, more complete analysis of the population 18 years of age and older is presented. Table 10 presents the expected numbers of students for each program area based on the district population percentages for each age category and the frequencies actually observed in each college program.

Table 10. Tri-C: District and college distributions by age

Age groups	Percentages of district population	No. of students expected in each program (based on n=40)	No. observed in College Parallel program	No observed in Career Development program
18-24	16.0%	6.4	36	37
25-34	17.6%	7.0	3	2
35-44	17.2%	6.8	1	0
45-54	19.4%	7.7	0	1
55-64	15.1%	6.0	0	0
65 and over	14.7%	5.8	0	0

Tri-C findings

Presentation and analysis of data for Tri-C follows the same sequences as for Marshalltown. The test of both sub-hypotheses was accomplished by using the chi square goodness of fit test between the Tri-C sample for each program area and the college district population parameters cited. Yates correction for continuity was applied to data on race and sex.

Comparison of observed and expected frequencies based on sex distribution reveal a chi square value of .568 for College Parallel program enrollments and a chi square value of 5.089 for the Career Development program. Since the table value of 3.841 for one degree of freedom at the .05 level of confidence is greater than the computed College Parallel value and less than the computed Career Development value, the data fail to reject the null hypothesis 2.1 regarding sex but does reject hypothesis 2.2 regarding sex. Enrollment in the College Parallel program at Tri-C does reflect the distribution of the district according to sex but the Career Development program does not. Enrollment in the Career Development at Tri-C is 52.2% male and 47.8% female.

A comparison of observed and expected data frequencies based on the socio-economic level of students in the College Parallel program reveals a chi square value of 16.125. Analysis of the Career Development program enrollment on this parameter reveals a chi square value of 19.898. Both of these values are significantly larger than the table value of 5.991 for two degrees of freedom at the .05 level of confidence as well as the table value of 13.815 at the .001 level of confi-

dence. Null hypotheses 2.1 and 2.2 that the college programs reflect the socio-economic status of the college district are rejected. In both program areas, the low socio-economic class is under-represented, making up only 22% of the student populations.

Evaluation of college enrollments according to racial distribution was possible since both programs were expected to enroll more than five non-Caucasians. A comparison of observed and expected frequencies based on racial distribution reveal a chi square value of 3.424 for the College Parallel program and a chi square value of 2.065 for the Career Development program. Since both these figures are below the table value of 3.841 at the .05 level of confidence for one degree of freedom, the data fail to reject null hypotheses 2.1 and 2.2 regarding race; both programs at Tri-C reflect the racial distribution of the college district.

As with the Marshalltown data, statistical comparison of student enrollment and community population on the basis of age is unnecessary. The sample data reveal that student enrollments are highly concentrated in the 18-24 year age range. College Parallel enrollment included three persons in the age category 25-34 and one person in the age category 35-44 years. Career Development program enrollment included two persons in the 25-34 year age range and one person in the 45-54 age range. It is apparent that neither the College Parallel nor the Career Development programs reflect the age distribution of the district. Null hypotheses 2.1 and 2.2 regarding age are therefore rejected.

A summary of the Tri-C findings related to sub-hypotheses 2.1 and 2.2 are presented in Table 11.

Table 11. Summary of Tri-C findings for Ho. 2.1 and 2.2

Sub-ho.	College Parallel Program	Career Development Program
2.1 and 2.2 (age)	reject null hypothesis	reject null hypothesis
2.1 and 2.2 (sex)	null hypothesis not rejected	reject null hypothesis
2.1 and 2.2 (race)	null hypothesis not rejected	null hypothesis not rejected
2.1 and 2.2 (socio-economic level)	reject null hypothesis	reject null hypothesis

Willaim Rainey Harper Community College District

The following demographic data were obtained from the 1970 Bureau of Census data.

Total population The community college district includes the townships of Elk Grove, Shaumberg, Palantine, Barrington, and Cuba. The total population of the district is 259,507.

Racial distribution The racial breakdown of the district is 99.99% Caucasian and .01% non-Caucasian. It was expected that there would be no non-Caucasian students enrolled in the college.

Socio-economic distribution 28.9% of the district population was classified as poverty or near-poor (annual income of $3,000.00 or less); 63.6% of the population was classified as middle income (annual income of $3,000.00 to $15,000.00); and 7.8% was classified as high income (annual income of $15,000.00 or more). Based on these per-

centages, it was expected that of the students sampled, 3.12 would fall in the high income category, 25.32 would fall in the middle income category, and 11.56 would fall in the low income category for each program area.

Sex distribution Of the population 18 years of age and older, 49.7% was male and 50.3% was female. The expected frequencies in each program area were 19.88 male and 20.12 female.

Age distribution 40.8% of the district population was 17 years of age and below, 41.1% was 18 to 45 years of age, and 18.1% was 45 years of age and older. Further analysis of the population 18 years of age and older is provided below. Table 12 also presents the numbers of students expected in each age group for each program based on district age percentage rates and student sample size of 40 for each program and the frequencies actually observed.

Table 12. Harper: District and college distributions by age

Age groups	Percentages of district population	No. of students expected in each program (based on n=40)	No. observed in College Parallel program	No. observed in Career Development program
18-24	15.3%	6.12	39	38
25-34	24.3%	9.72	1	1
35-44	25.9%	10.36	0	0
45-54	18.8%	7.52	0	0
55-64	9.0%	3.60	0	1
65 and over	6.7%	2.68	0	0

Harper College findings

Presentation and analysis of data follows the same form as before. The test of both sub-hypotheses was accomplished using the chi square goodness to fit test between the Harper College sample for each program area and the college district population parameters cited. Yates correction for continuity was applied to the data on race and sex.

Comparison of observed and expected frequencies based on sex distribution reveal a chi square value of 17.163 for the College Parallel program and a chi square value of 12.314 for the Career Development program. Since these values are considerably larger than the table value of 3.841 for one degree of freedom at the .05 confidence level and the table value of 10.827 at the .001 level of confidence; null hypotheses 2.1 and 2.2 regarding sex are rejected. Enrollment at Harper College does not reflect the district population in that the female enrollment numbers only 7 in the College Parallel program and 9 in the Career Development program.

A comparison of observed and expected data frequencies based on socio-economic level of students in both programs reveal a chi square value of 11.609 for College Parallel and 6.441 for Career Development. Since these values are larger than the table value of 5.991 for two degrees of freedom at the .05 level of confidence, null hypotheses 2.1 and 2.2 regarding socio-economic level are rejected. Enrollments in both programs fail to adequately represent the low socio-economic population of the district. The College Parallel program is less representative than the Career Development program.

Statistical evaluation of data based on race would be of little validity since no non-Caucasians were expected to be enrolled in either program at Harper College. Since the observed enrollment of non-Caucasians was also zero, it must be concluded that the college does represent the community in this regard. The data fail to reject null hypotheses 2.1 and 2.2 regarding race.

As was the case with the other two colleges, enrollments at Harper College failed to represent the total age distribution of the district. Student enrollments in both programs again reflect an emphasis on the 18-24 year age category. Null hypotheses 2.1 and 2.2 regarding age are rejected.

A summary of the Harper findings related to sub-hypotheses 2.1 and 2.2 are presented in Table 13.

Table 13. Summary of Harper findings for Ho. 2.1 and 2.2

Sub-ho.	College Parallel Program	Career Development Program
2.1 and 2.2 (age)	reject null hypothesis	reject null hypothesis
2.1 and 2.2 (sex)	reject null hypothesis	reject null hypothesis
2.1 and 2.2 (race)	null hypothesis not rejected	null hypothesis not rejected
2.1 and 2.2 (socio-economic level)	reject null hypothesis	reject null hypothesis

Major Ho. 2

The data presented are based on parameters and relationships expressed in the model devised by this researcher. The foregoing findings reflect the direction and extent that the College Parallel and Career Development programs "reach" the community populations. Statistical analysis of data was possible except in those instances where college enrollments provided data frequencies of zero. In these instances, conclusions relating to the sub-hypotheses were unambiguous.

The null hypothesis that the model is not an effective tool for evaluating the extent and direction in which community college goals (programs) are being achieved is rejected. The model does provide a method of determining whether or not the entire college district is being directly served by these two program areas under study.

Major Ho. 3

The model is not an effective tool for determining if institutional emphasis on a single program exists at the local college level. The test of this major hypothesis involves testing several sub-hypotheses. The first is as follows:

Ho. 3.1 There is no significant difference in the age, sex, race and socio-economic status and number of high school graduates of students enrolled in College Parallel programs and the age, sex, race, socio-economic status and number of high school graduates of students enrolled in Career Development programs.

The test of the hypothesis according to sex distribution made use of the chi square test of independence. Comparison of males and fe-

males enrolled in each of the two college programs at Marshalltown yield a chi square value of .154. Since this value is less than the table value of 3.841 using one degree of freedom at the .05 level of confidence; null hypothesis 3.1 regarding sex is not rejected with the conclusion that students are enrolled in college programs independent of sex.

Students were classified into the three socio-economic categories of high, medium and low on the same basis as was done in the testing of major hypothesis two and a chi square test of independence was computed on College Parallel and Career Development student enrollments. The computed chi square values are 5.016 for Marshalltown, 1.454 for Tri-C and 3.058 for Harper. These values are less than the chi square value of 5.991 using two degrees of freedom at the .05 confidence level; null hypothesis 3.1 regarding socio-economic level are not rejected and it must be concluded that students enroll in both college programs independent of socio-economic level.

Examination of the racial distribution of students enrolled in each program reveal that the total sample of students in both programs at Marshalltown and Harper were Caucasian. A chi square test of independence using the Yates correction for continuity was computed on the racial distribution of students enrolled in the College Parallel and Career Development programs at Tri-C. The analysis produces a chi square value of .058 which is less than the table value of 3.841 using one degree of freedom at the .05 level of confidence. The conclusion is that students enroll in both college programs independent of race and null hypothesis 3.1 regarding race is not rejected.

The age of students enrolled in each program was reclassified to reflect in four categories, student enrollment for ages 18, 19, 20 and 21-30. Because a sufficient number of students aged 17 were enrolled in the College Parallel program at Marshalltown, that additional age category was added. A chi square test of independence was computed on student enrollments according to these age categories. The computed chi square values are 12.136 for Marshalltown, .134 for Tri-C and 4.036 for Harper. The table value of 9.488 for four degrees of freedom at the .05 level of confidence is less than the computed value of the Marshalltown data. The table value of 7.815 for three degrees of freedom at the .05 confidence level is greater than the computed values for the Tri-C and Harper data. Thus null hypothesis 3.1 regarding age is not rejected for the latter two colleges but is rejected for Marshalltown. The expectation that students are enrolled in college programs independent of age is upheld for Tri-C and Harper but not for Marshalltown.

Examination of the students who were high school graduates reveal that of the total 120 students sampled, only five were not high school graduates. Of these, three were enrolled in the College Parallel program and two were enrolled in the Career Development program; two were enrolled at Marshalltown and three were enrolled at Tri-C. Since more than 95% of the sample had high school diplomas and those students who did not were nearly equally distributed between the two programs and among the three colleges; null hypothesis 3.1 regarding high school graduates is not rejected. A summary of findings related to sub-hypothesis 3.1 is presented in Table 14.

Table 14. Summary of findings related to Ho. 3.1

Sub-ho.	Marshalltown	Tri-C	Harper
3.1 (age)	reject null hypothesis	null hypothesis not rejected	null hypothesis not rejected
3.1 (sex)	null hypothesis not rejected	null hypothesis not rejected	null hypothesis not rejected
3.1 (race)	null hypothesis not rejected	null hypothesis not rejected	null hypothesis not rejected
3.1 (socio-economic level)	null hypothesis not rejected	null hypothesis not rejected	null hypothesis not rejected
3.1 (high school graduate)	null hypothesis not rejected	null hypothesis not rejected	null hypothesis not rejected

Ho. 3.2 There is no significant difference between the student/faculty ratios in the College Parallel program and the Career Development program.

In order to test this hypothesis, the students and faculty assigned to each college program were combined to form the classification "College Personnel" for each of the two program areas. This was possible since neither a student nor a faculty member was counted in more than one of the two college programs. Classification of the data is shown in Table 15.

Table 15. College Personnel

College/Program	College Personnel		Totals	Student/Faculty Ratios
	Students	Faculty		
Marshalltown:				
College Parallel	896	39	935	23:1
Career Development	100	16	116	6.5:1
			1051	
Tri-C:				
College Parallel	1990	48	2038	41:1
Career Development	1219	82	1301	14:1
			3339	
Harper:				
College Parallel	1519	23	1542	66:1
Career Development	340	23	363	15:1
			1905	

A null hypothesis was tested for statistical significance using the chi square test of independence. The computed chi square values are 17.575 for Marshalltown, 31.340 for Tri-C, and 34.126 for Harper. These values are significantly greater than the table value of 3.841 at the .05 level of confidence and 10.827 at the .001 level of con-

fidence, using one degree of freedom. Null hypothesis 3.2 is therefore rejected. It must be concluded that assignment of faculty is not independent of college program.

Ho. 3.3 There is no significant difference in the salaries received by College Parallel faculty and the salaries received by Career Development faculty.

The test of this hypothesis made use of the pooled t test computed between the mean salaries for the faculties for each program area at each of the three colleges. Since the number of faculty members assigned to each program was unequal at each college except Harper, F tests were conducted to determine homogeneity of variances. The mean salaries, computed F values, table F values and computed t values for each program comparison for each college are presented in Table 16.

Table 16. Faculty salaries

College/Program	Mean Salary	Computed F values	Table values for F at .05	Computed t values
Marshalltown				
College Parallel	9,332.58	.0119	$F_{1,53=4.02}$	2.005
Career Development	9,280.75	2.6049		
Tri-C				
College Parallel	10,614.33	2.6049	$F_{1,128=3.92}$	1.613
Career Development	11,100.12			
Harper				
College Parallel	10,289.34	.6162	$F_{1,44=4.06}$	2.008
Career Development	10,784.25			

All computed t values are less than the table value of 6.314 for one degree of freedom at the .05 confidence level. The data reveal that there is no significant difference between the salaries paid to College Parallel faculties and salaries paid to Career Development faculties at the three colleges. The data fail to reject null hypothesis 3.3.

The findings that only two items of program emphasis exist supports the contention that the colleges do not, for the most part, favor one college program to the detriment of the other in the variables tested. Use of the model provided insight into those areas where program emphasis did and did not exist. Thus, the foregoing data provides evidence to reject major hypothesis 3 in its null form. The model is an effective tool for determining if institutional emphasis on a single program exists at the local college level.

Major Ho. 4

The model presented is not a useful tool for evaluating the extent and direction to which community college goals are being achieved at the national level.

The test of this major hypothesis involves testing several sub-hypotheses; the first two are:

Ho. 4.1 There is no significant difference among the three institutions in the age, sex, race and socio-economic status of students enrolled in College Parallel programs.

Ho. 4.2 There is no significant difference among the three institutions in the age, sex, race and socio-economic status of students enrolled in Career Development programs.

As was previously determined in the second hypothesis, the age distribution of students enrolled in the college programs rarely exceeds the age category of 18-24 years. Test of sub-hypotheses 4.1 and 4.2 made use of the four age categories established in hypothesis 3.1 and are presented in Table 17 and 18 along with frequency counts of enrollments in each of the program areas. Since Marshalltown's College Parallel program, but not its Career Development program, included a number of 17-year-olds, that age is included accordingly. Persons over 30 years of age were eliminated in the analysis of data.

Table 17. Number of students enrolled in College Parallel programs by age

College	17-18	19	20	21-30	Totals
Marshalltown	24	6	6	4	40
Tri-C	16	17	5	2	40
Harper	11	13	6	9	39
Totals	51	36	17	15	119

Table 18. Number of students enrolled in Career Development programs by age

College	17-18	19	20	21-30	Totals
Marshalltown	15	19	1	4	39
Tri-C	14	10	9	6	39
Harper	11	13	7	8	39
Totals	40	42	17	18	117

Chi square tests of independence computed on ages of students for each program area yield values of 14.788 for the College Parallel programs which is greater than the table value of 12.592 for six degrees of freedom at the .05 confidence level and 1.279 for the Career Development programs which is less than the table value of 12.592. The data, therefore reject hypothesis 4.1 but fail to reject hypothesis 4.2 regarding age. There is a difference among the three colleges regarding the age of students in the College Parallel program but not in the Career Development program.

Frequency counts of the number of students enrolled in each program for each college by sex are presented in Tables 19 and 20.

Table 19. Number of students enrolled in College Parallel programs by sex

College	Male	Female
Marshalltown	26	14
Tri-C	21	19
Harper	33	7
Totals	80	40

Table 20. Number of students enrolled in Career Development programs by sex

College	Male	Female
Marshalltown	26	14
Tri-C	29	11
Harper	31	9
Totals	86	34

Chi square tests of independence computed for each program area yield values of 8.192 for the College Parallel programs which is larger than the table value of 5.991 for two degrees of freedom at the .05 confidence level. Null hypothesis 4.1 regarding sex is rejected. Computation of chi square for the Career Development programs yield a value of 1.563 which is less than the table

value of 5.991 for two degrees of freedom at the .05 confidence level, and fails to reject null hypothesis 4.2 regarding sex. Thus, although there is no significant difference among the three colleges regarding the distribution of students by sex in the Career Development program, there is a significant difference among the schools in the College Parallel programs.

Frequency counts of the number of students enrolled by socio-economic status are presented in Tables 21 and 22.

Table 21. Number of students enrolled in College Parallel programs by socio-economic level

College	High Income	Middle Income	Low Income
Marshalltown	10	16	14
Tri-C	6	25	9
Harper	3	35	2
Totals	19	76	25

Table 22. Number of students enrolled in Career Development programs by socio-economic level

College	High Income	Middle Income	Low Income
Marshalltown	6	26	8
Tri-C	4	30	6
Harper	1	33	6
Totals	11	89	20

The data were analyzed using the chi square test of independence. The computed values are 4.500 for the College Parallel programs and 4.757 for the Career Development programs. Since neither value is as large as the table value of 9.488 for four degrees of freedom at the .05 level of confidence, the data fail to reject null hypotheses 4.1 and 4.2. Enrollment by socio-economic in both college programs is consistent across the three institutions studied.

Since only one school produced data involving non-Caucasian enrollments, hypotheses 4.1 and 4.2 regarding race cannot be tested statistically. The conclusion can be drawn however, that the colleges are not similar in terms of the racial distribution of their student bodies, thus rejecting null hypotheses 4.1 and 4.2 regarding race.

A summary of the findings related to sub-hypotheses 4.1 and 4.2 is presented in Table 23.

Table 23. Summary of findings related to sub-hypotheses 4.1 and 4.2

Sub-ho.	Comparisons among Colleges
4.1 (age)	reject null hypothesis
4.1 (sex)	reject null hypothesis
4.1 (race)	reject null hypothesis
4.1 (socio-economic level)	null hypothesis not rejected
4.2 (age)	null hypothesis not rejected
4.2 (sex)	null hypothesis not rejected
4.2 (race)	reject null hypothesis
4.2 (socio-economic level)	null hypothesis not rejected

Ho. 4.3 There is no significant difference among the three institutions in the age, sex, race and socio-economic status of students who transfer to 4-year institutions from the College Parallel programs.

The data related to this hypothesis was examined in the same manner as for the two previous hypotheses. The total sub-sample size is smaller (64) in this analysis since only those students who transferred to 4-year institutions is being considered. The age distribution of students who transferred to 4-year institutions from College Parallel programs from each of the three institutions is presented in Table 24.

Table 24. Age distribution of students who transferred to 4-year institutions

College	17-18	19	20	21-30	Totals
Marshalltown	15	4	2	2	23
Tri-C	4	9	3	5	21
Harper	7	9	4	0	20
Totals	26	22	9	7	64

Computation of the chi square test for independence yield a value of 15.411 which is greater than the table value of 12.592 for six degrees of freedom at the .05 confidence level. The data reject null hypothesis 4.3 regarding age. It must be concluded that there is a significant difference among the colleges in the age distribution of students transferring from their institutions to 4-year colleges and universities.

The sex distribution of students who transferred from the College Parallel programs of the three institutions to 4-year institutions is presented in Table 25.

Table 25. Sex distribution of students who transfer to 4-year institutions

College	Male	Female
Marshalltown	15	8
Tri-C	13	8
Harper	18	2
Totals	46	18

Computation of the chi square test for independence yield a value of 4.673 which is less than the table value of 5.991 for two degrees of freedom at the .05 confidence level. The data fail to reject null hypothesis 4.3 regarding sex. It must be concluded that there is no difference among the colleges in the sex distribution of students transferring from their institution to 4-year colleges and universities.

The socio-economic distribution of students who transferred from the College Parallel programs of the three institutions to 4-year institutions is presented in Table 26.

Table 26. Socio-economic distribution of students who transfer from College Parallel programs to 4-year institutions

College	High Income	Middle Income	Low Income
Marshalltown	7	10	6
Tri-C	3	14	4
Harper	1	19	0
Totals	11	43	10

Analysis of the data reveal a computed chi square value of 13.640 which is greater than the table value of 9.488 for four degrees of freedom at the .05 confidence level. Null hypothesis 4.3 regarding socio-economic levels is therefore rejected. The conclusion is that there is a difference among the three institutions in the socio-economic level of students who transfer from their colleges to 4-year institutions.

Again, statistical comparisons among the schools regarding the distribution of non-Caucasions who transfer to 4-year colleges and universities cannot be accomplished statistically. Since four of the 21 students who transferred to 4-year institutions from Tri-C were non-Caucasian, it can be concluded that there is a difference among the institutions in this regard and null hypothesis 4.3 regarding race is rejected.

A summary of the findings related to sub-hypothesis 4.3 is presented in Table 27.

Table 27. Summary of findings related to sub-hypothesis 4.3

Sub-ho.	Comparisons among Colleges
4.3 (age)	reject null hypothesis
4.3 (sex)	null hypothesis not rejected
4.3 (race)	reject null hypothesis
4.3 (socio-economic level)	reject null hypothesis

Ho. 4.4 There is no significant difference among the three institutions in the age, sex, race and socio-economic level of Career Development students who are currently employed in the field in which they were trained.

The data related to this hypothesis was examined in the same manner as in hypothesis 4.3. The sub-sample size in this instance is 38 and represents those students who currently hold work positions in the field in which they received training at the community college in 1968. The age distribution of these students is presented in Table 28.

Table 28. Age distribution of students currently employed in original field of training

College	17-18	19	20	21-30
Marshalltown	6	6	0	0
Tri-C	4	5	4	5
Harper	3	2	1	2
Totals	13	13	5	7

Analysis of the data yield a chi square value of 8.834 which is less than the table value of 12.592 for six degrees of freedom at the .05 confidence level. The data fail to reject null hypothesis 4.4 regarding age. It must be concluded that there is no institutional difference in the age distribution of students who continue to work in the field for which they were trained.

The sex distribution of students who are currently employed in their field of training is presented in Table 29.

Table 29. Sex distribution of students employed in original field of training

College	Male	Female
Marshalltown	10	2
Tri-C	9	9
Harper	5	3
Totals	24	14

Computation of the chi square test for independence yield a value of 3.443 which is less than the table value of 5.991 for two degrees of freedom at the .05 level of confidence. The data fail to reject null hypothesis 4.4 regarding sex. It must be concluded that there is no significant difference in the sex distribution of students who continue employment in their field of training.

The socio-economic distribution of students currently employed in the field of their original training is presented in Table 30.

Table 30. Socio-economic distribution of students currently employed in original field of training

College	High Income	Middle Income	Low Income
Marshalltown	3	7	2
Tri-C	4	12	2
Harper	1	6	1
Totals	8	25	5

Data analysis reveals a chi square value of .845 which is less than the table value of 9.488 for four degrees of freedom at the .05 level of confidence. Null hypothesis 4.4 regarding socio-economic levels is not rejected. The conclusion is that there is no significant difference among the three colleges in the socio-economic distribution of students who continue to be employed in the field for which they were trained.

Statistical comparisons among the colleges regarding the distribution of non-Caucasians who continue employment in their field of training cannot be statistically accomplished. Since four of the 18 students from Tri-C who continue to be employed in their original area of training are non-Caucasian, it can be concluded that there is a difference among the schools in this regard and null hypothesis 4.4 regarding race is rejected.

A summary of the findings related to sub-hypothesis 4.4 is presented in Table 31.

Table 31. Summary of findings related to sub-hypothesis 4.4

Sub-ho.	Comparisons among Colleges
4.4 (age)	null hypothesis not rejected
4.4 (sex)	null hypothesis not rejected
4.4 (race)	reject null hypothesis
4.4 (socio-economic level)	null hypothesis not rejected

The purpose of major Ho. 4 is to determine whether or not there is sufficient commonality among community colleges to validate the practice of combining data from all these colleges and presenting the benefits derived from their existence in aggregated form at the national level. Although data on the inputs and outputs of Career Development programs are similar enough to make aggregated data at the national level a valid indicator of goal attainment of community colleges, such is not the case for data on College Parallel programs

Use of the parameters indicated in the model has shown the extent and direction of goal attainment across the three institutions. Major hypothesis 4 in its null form is therefore rejected.

CHAPTER V. DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

The purpose of this research effort was not to determine whether or not particular community college were or were not performing the tasks they have been assigned. It was instead, an effort to determine whether or not the model devised by this researcher is a viable tool for determining the extent of the benefits derived from community college programs. Some interesting facts have been discovered regarding the colleges themselves. Perspective is lost, however, if this information is not related back to the model.

The organization of this chapter follows the sequence established in Chapter IV. Discussion is directed toward each major hypothesis and its concomitant sub-hypotheses. General comments regarding use of the model are presented immediately thereafter, followed by recommendations for further research and final conclusions.

Discussion

Major Hypothesis 1

The first major hypothesis is concerned with determining the relationships that do and do not exist between resources directed into program areas of community colleges and the outputs of those programs. This pilot study concentrated on the input variable of student/faculty ratio. This variable was selected because it is a measure traditionally offered by educators as criteria and evidence for "good" educational

programs. It is recognized that the outputs of program completion, application and transfer to 4-year colleges and universities, length of time students remain at 4-year institutions, and type of initial and current job placement, constitute only limited representations of the total outputs of the educational process. They do, however, relate directly to community college goals and can be measured. This research effort attempted only to establish justification for further research based on the presence or absence of relationship "trends" between student/faculty ratios and these several output variables. The conclusion is that there is some evidence that trends do exist between these variables. However, "complete" relationships between student/faculty ratios and output variables were not always observed. For example, doubling the student/faculty ratio (from 6.25:1 to 14:1) did not result in significantly reducing the number of students who completed the program. The same lack of completeness was found in the relationships that were found between student/faculty ratios and the number of students who transferred to 4-year institutions and student/faculty ratios and the number of students who graduate from 4-year institutions.

Comparison of student/faculty ratios to the type of employment the student holds immediately after attending the community college and from 2-4 years after graduation produced findings from which no relationship trends could be determined. It is quite possible however, that the type of employment students engage in after completion of a community college training program is related more to the demands of

the job market than to the adequacy of training.

Note should also be made of the percentages of full-time and part-time students within each of the two program areas at Tri-C. Approximately one-half of the students enrolled in the College Parallel program were full-time students whereas, only one-third of the students enrolled in the Career Development program were enrolled full-time. Since only the full-time students were counted in the student/faculty ratios, two-thirds of the Career Development student population was not included in the data. Thus, the student/faculty ratio reported for Tri-C's Career Development program may be a distortion of the situation as it really existed. That is, the actual ratio may be higher than reported since the efforts of a large number of full-time Career Development faculty are probably required to serve the needs of the relatively large part-time Career Development student body.

Summary of the data related to testing the first major hypothesis (Table 7) shows that the model completely reflects relationships between student/faculty ratios and two of the six output variables and reflects partial relationships between student/faculty ratios and the other four output variables. There is, therefore, some support for use of the model in visualizing the relationship between these inputs and outputs of the community college.

Major Hypothesis 2

The second hypothesis involves identification of those populations within the community who receive direct benefits from the commu-

nity college in terms of enrollment in either the College Parallel or Career Development programs. In every instance, it was discovered that community college enrollments reflect almost completely the traditional college-aged student (from 18-22). Despite the fact that a major portion of the population in every college district was over 30 years of age, the college programs failed to represent the over-30 age group in their enrollments.

The "expected" number of students by age category for each college program is presented in Tables 8, 10, and 12. The expected value is a function of the percentage of the total district population in that age category and a student sample of 40. This method applied equal probability of enrollment by age group and questions can be raised regarding whether this approach is realistic. First, it would be expected that a greater percentage of the district population over 30 years of age already have college degrees than does the population aged 18-24. Secondly, since the percentage of "degree-holders" would probably be different in each college district, completely accurate expectancies according to age group would have to be determined for each district.

Comparison of the sex distribution in the college districts and the student bodies resulted in rejection of the null hypothesis in every instance but one. With the exception of the enrollment in the College Parallel program at Tri-C, the female population was significantly under-represented in college enrollments. This trend existed to a greater degree within the Career Development programs than within the College Parallel programs. Examination of the district population en-

rolled in the two programs according to socio-economic groupings resulted in rejection of the null hypothesis in every instance. With only one exception (the College Parallel program at Marshalltown), the low socio-economic group of the community was not reflected in the college enrollments. The College Parallel program at Marshalltown underrepresented the middle income students in favor of the high income students. Both programs at Tri-C failed to enroll the expected number of low income students and further, as the college in the district with the highest percentage of low socio-economic persons, it did not enroll the greatest number of low income students. The results of this finding may be significantly influenced by the criteria imposed by this researcher on the determination of socio-economic level of students. This research classified a low income student as one who received no financial assistance from home including the benefits of living at home. It may be that transportation facilities to and from the college were more available to Tri-C students than to Marshalltown or Harper students with the consequence that low income students attending Tri-C did live at home but were classified as middle income. It is also possible that the classification is accurate.

Examination of the benefits derived to community populations based on race was somewhat limited in this research project because the samples from two of the colleges contained no non-Caucasian students. Since the same college districts contained few if any non-Caucasians, the null hypothesis was not rejected.

The model has provided a method for determining which of the various

sub-populations within the community were being served directly by the College Parallel and Career Development programs. Statistical analysis of the data derived is possible except in those instances where college enrollments provide zero frequencies. In such instances (for example, the data regarding the age of the population served) conclusions are unambiguous.

Major Hypothesis 3

The third major hypothesis attempts to determine if examination of selected variables indicate a program emphasis within any of the three colleges. The data were examined to determine if there was a substantially greater enrollment in either of the two college programs of students in any one age, sex, race, or socio-economic category. The conclusion in every instance was that students enroll in both college programs independent of sex, socio-economic level and race. The expectation that students enroll in the College Parallel and Career Development programs independent of age is upheld for Tri-C and for Harper but not for Marshalltown. The Marshalltown data reflect the fact that a significantly greater number of 19-year-olds were enrolled in the Career Development program than in the College Parallel program (19 versus 6) and a greater number of 17 and 18-year-olds were enrolled in the College Parallel program than in the Career Development program.

It is possible that these data reflect the age at which students graduate from high school and the nature of their past educational

experiences rather than any program emphasis on the part of the college. That is, it is possible that students who graduate from high school at an earlier age also have a more "successful" high school experience and this fact prompts them to pursue higher education in its traditional, liberal arts form (as represented by the College Parallel program). Students inclined toward Career Development programs may experience less success academically at the secondary level, are older at high school graduation, and are inclined toward job training rather than traditional higher education.

The finding that almost the entire sample consisted of high school graduates prevented the type of analysis required by hypothesis 3.1. Since all the colleges essentially "required" a high school diploma for entrance into either program area examined, it is expected that most of the students enrolled would have fulfilled this requirement. The finding therefore, that there is no difference between the college programs in the number of students who are high school graduates is more a function of general admission policies than college program emphasis, and in fact, contributes to equalizing the inputs into the two program areas.

The hypothesis (3.2) that there was no difference between the college programs in student/faculty ratios was rejected at all three colleges. It can be observed in Table 15 that students are enrolled in the College Parallel and Career Development programs on approximately a 9:1, 1,5:1 and 5:1 basis reflecting higher enrollments in College Parallel programs. The faculty is assigned to the College

Parallel and Career Development programs on approximately a 2:1, 1.7:1 and 1:1 basis which reflects that a lower proportion of faculty are assigned to each College Parallel student than to each Career Development student. The conclusion is that faculty assignments are not independent of college program and favor the Career Development program. It is apparently the general practice, at least among these three colleges, to maintain a lower student/faculty ratio in Career Development programs than in College Parallel programs. The practice may be based on the assumption that the type of training involved in Career programs requires close supervision by faculty. It is interesting to note, however, that the "returns" are no greater for the Career Development programs than for the College Parallel program. As was pointed out in the findings of the first major hypothesis, an equal or lower number of students complete the Career Development program than the College Parallel program.

Attention is called to the College Parallel enrollment for Harper as presented in Table 15. Of the total full-time student population at Harper, 617 were designated as "unclassified" by the college in that they were not officially enrolled in either college program. Since these students were taking at least 12-13 credit hours and represented a significant use of college resources, they could not be discarded in the analysis of the data. Their numbers are included within the College Parallel program because the majority of their course work was in the area of "general studies" which is similar to the College Parallel curriculum.

The relationships presented in the model point to areas of program emphasis as well as to areas in which no college program emphasis exists. Thus, there is evidence that the model is an effective tool for determining if institutional emphasis exists at the local college level. When it is discovered that a single type of emphasis exists across all community colleges (as was the case with student/faculty ratios) the data can legitimately be aggregated at the national level as an indicator of community college performance.

Major Hypothesis 4

The purpose of major hypothesis 4 is to determine whether or not there is sufficient commonality among community college inputs and outputs to support the current practice of combining and presenting data pertaining to them in aggregated form at the national level.

Differences in the age, race, and sex of students enrolled in the College Parallel programs of the three colleges were found. Only one of the colleges enrolled students who were non-Caucasian. Marshalltown's enrollment of 17 and 18-year-olds in the College Parallel program was greater than its combined enrollment for the remaining three age groups while the other two colleges showed a more equal distribution in their enrollments according to age. One of the colleges had a nearly equitable enrollment in its College Parallel program according to sex distribtuion while the other two colleges had enrollments that significantly favored males.

Differences in the students enrolled in the Career Development programs across the three colleges were found only in regard to race. Similarities were found in the ages of students enrolled in Career Development program areas significantly favored males at all three institutions.

The sample data reveal a commonality in the students enrolled in both College Parallel and Career Development programs according to socio-economic level. Both programs at all three colleges had an enrollment that was highly concentrated in the middle income range.

Thus the only input variable common to both college programs that justifiably lends itself to aggregation across colleges is enrollments on the basis of socio-economic level. There is no other input variable for which College Parallel data may be aggregated. Career Development data may be aggregated on the additional input variables of age and sex.

Differences regarding the outputs of the three colleges were also discovered. The students who transferred from the College Parallel program from the three colleges were dissimilar in terms of age, socio-economic level and race. It is consistent with the previous findings that the college that enrolled the greater number of 17 and 18-year-olds would also provide a greater number of this age category as transfer students to 4-year colleges and universities. Comparison of the students who transfer to 4-year institutions based on socio-economic status reveal that one of the colleges provided transfers that were almost completely from the middle income class while

another college provided nearly equal numbers of transfer students from all three socio-economic levels.

The single commonality among the outputs of the College Parallel program relates to the sex distribution of students who transfer to 4-year institutions. At least two out of every three community college transfer students are male.

The only difference in the outputs of the Career Development programs of the three colleges was again related to race. Similarities existed in the age, sex, and socio-economic level of students currently employed in the field for which they were trained.

Thus, aggregation of College Parallel output data appears to be valid only in relation to the sex of transfers to 4-year institutions. There is also sufficient commonality fo the age, sex, and socio-economic level of Career Development students who continue employment in their field of training to justify aggregation of this data at the national level.

Use of the parameters indicated by the model has made visible several similarities and several dissimilarities that exist in the inputs and outputs of the community colleges under study here. The data have pointed out which of the inputs and outputs of community college programs may be accurately aggregated and applied to all community colleges. The model has also pointed to those parameters which may be common to only a few community colleges. Reports regarding these latter variables, if stated in generalized terms as applying to all community colleges in the nation will result in misin-

formation concerning the nature of the community college as it exists as a single unit.

Total evaluation of the model as a useful tool for use by administrators and policy-makers at the local and at the national level must include analysis of the ease with which it can be used. The telephone survey method is a time-consuming process when data is sought on students who were enrolled at the institution five years previous to the time the research is being conducted. In order to attain a sample size of 40, it was necessary to attempt contacts with from 20% to 50% additional students than was required. This fact in itself, may have distorted the results of this research. That is, it is possible that upwardly mobile and the low income class are represented in those contact attempts which were unsuccessful and the majority of successful contacts are representative of a less mobile middle class. Since the socio-economic status of students was determined in the course of the interview, this fact cannot be verified.

Since follow-up contact by telephone is dependent on information regarding the parent's name and address, this information on the student's admission form is vital. One college studied retains no information on parents in the student's permanent record. Contact with parents is therefore more time-consuming since a process of elimination using the local telephone directory must be used. It is assumed, however, that general use of the model would involve follow-up attempts that are closer in time to student enrollment dates and some of the above problems would therefore be eliminated. The telephone survey is an inexpensive method of research if the research is on an on-site nature,

and it does provide a fairly rapid way of collecting a great amount of follow-up data.

The Student Data Sheet contains five racial categories and it was anticipated that these data would be compared to Bureau of Census data along these lines. However, the Bureau of Census provides no racial data on American Indians per se. Further, the Spanish American group is counted in the Caucasian group in some states rather than separately identified. When this group is identified, it often includes blacks and other races. Because of the foregoing, classification by race in this research is limited to Caucasian and non-Caucasian. Further, it was expected that racial and ethnic affiliation of the student populations would be available within the student records. Such was not the case in all instances. Marshalltown had within its permanent student record, a photograph of the student and thus, categorization of the student by race could be fairly accurately determined. Harper and Tri-C have no racial data on the students they enroll. It was necessary therefore, to acquire racial data at these two colleges in the course of the telephone interview. It appears that racial data is becoming more difficult to acquire.

Final remarks must include comments regarding the relationship of the findings of this research project to the larger system of education is shown in Figure #2 of the model. It has been shown that the kinds of inputs received by community colleges are affected by the high schools and 4-year institutions with which they interact. At Marshalltown for example, the freshman class was younger than were the

freshman classes at Harper and Tri-C. This was due to the fact that one-fourth of the students had graduated from high school by the time they were 17 years old. As a further consequence, Marshalltown transferred a younger age group than the other two colleges, to 4-year institutions. It was also noted earlier in this paper that Harper students were often transfers on academic probation from their original 4-year college. They entered Harper, for the most part, as second year students and planned to stay long enough to raise their grade point averages.

The relationship of community college activities to other social institutions, as depicted in Figure 1, is also relevant. It was discovered that the three colleges studied "reach" the same population in terms of age. Although one of the goals of the community college is to reach all members of the community, it is apparent that, with few exceptions, the focus of each college has been at the population aged 18-30. This type of information is significant in terms of activities on the part of other agencies within the local community college district. If the community college does not serve the middle-aged and elderly in the community, other agencies must gather forces and exert efforts toward this end.

Recommendations for Further Research

It has been pointed out that the College Parallel and Career Development programs of the colleges studied serve only the young per-

sons in the district. It may be that each of the colleges has determined previously that some other program area offered by the college will serve the older populations in the community. This premise requires investigation of the age groups being served by the other program areas shown in Figure #3 of the model. If it is the intent of the colleges to serve the different populations in the community with different program areas, this orientation should be clearly stated, both within the confines of the institution and the larger community. This step, the specification of goals and objectives in relation to each college program is necessary for complete and accurate assessment of the contributions of the community college system and requires cooperative research efforts on the part of these institutions.

Other research efforts need to be directed toward standardizing the terminology used by community colleges. As was pointed out in the beginning of the Findings section, the college degree of Associate in Sciences means a college transfer program at two of the institutions, and career job training at one of the institutions. Thus data accumulation and reporting regarding the inputs and outputs of the A.A.S. degree program would result in the accumulation of different kinds of data at the different schools.

There is also a need for standardizing the kind of data collected on students among the colleges across the nation. In examining the data available at each of the colleges, it was discovered that there is a vast amount of information collected by each of the colleges. The nature of the information is different at each college, and repre-

sents responses to requests made by state or national agencies or by the researchers at the individual colleges. Since the same information is not available at all colleges, it cannot be used as a basis for comparative research among several institutions. Research that focuses on determination of the type of data collected by community colleges across the nation is necessary for complete evaluation of the system.

The relationships that exist among the different educational subsystems as shown in Figure #2 in the model is also a relevant area for research. It has been shown that the kinds of inputs received by community colleges are affected by the high schools and 4-year institutions within the district. At Marshalltown for example, the freshman class was younger than the freshman classes at Harper and Tri-C. This was due to the fact that one-fourth of the students had graduated from high school by the time they were 17-years-old. As a further consequence, Marshalltown transferred a younger age group than the other two colleges, to 4-year institutions. It was also noted earlier in this paper that Harper students were often transfers on academic probation from their original 4-year college. They entered Harper, for the most part, as second year students and planned to stay only one year in order to raise their grade points.

It is recommended that the several questions raised by the findings presented here, be further researched. For example, the whole area of the socio-economic levels represented by the student bodies at community colleges would constitute a major research effort in and of itself, since full determination of socio-economic status involves

parameters of occupation, housing, educational level as well as annual income.

Another area of research would involve identification of the training that students who continue to be employed in their field of training receive. It may be possible that the community colleges are training some students to perform work tasks for which there is no need in the community. A finding of this nature would require re-evaluation of the Career Development program in terms of the benefits derived both by the students who engage in the training program and by the employers within the community who have a need for trained personnel.

It is recommended that the nature of the data that are being accumulated in aggregate form at the national level be re-evaluated to determine those variables for which this is a legitimate practice and those for which it is not. The result of this differentiation would be the development of sources of information in which data remain in its disaggregated form and is therefore more reliable than the same data in aggregated form.

It is recommended that relationship presented in Figures #6, #7, #8, and #9 of the model be examined and tested in a manner similar to that used in this research. Also research should be conducted regarding the relationships presented in Figures #4 and #5 but not tested in this research project.

It is recommended that the model presented here be shared with educators with the idea that there may exist individual research efforts that have been directed toward investigation of some of the

model parameters. Thus, findings from other research projects could possibly confirm or discount the models viability.

It is recommended that models similar in orientation to the one presented here be developed for other educational subsystems (e.g. the systems of elementary and secondary education, private and public 4-year colleges and universities).

It is recommended that the input parameter of high school graduates be eliminated from Figure #4 and #5 of the model. Since colleges consistently require a high school diploma of applicants into the College Parallel and Career Development programs, the variable is ineffective for differentiating between college programs and among institutions.

Final Conclusions

The outputs of education are elusive. This research has studied only the manifest functions and benefits derived by the existence of the community college in American society. The latent functions such as a "holding pen" for young men and women or "sorting and selecting" agency that occurs as an integral part of the institution have not been measured. Further, the fringe benefits such as a "better self-understanding" or a "broader world view" have not been considered here. The model contains variables other than those examined in this research project which may be more sensitive to identification and measurement of these kinds of educational benefits.

Further, the variables selected for study here revealed few differences between the two college programs. Other variables in the model may prove to be more effective indicators of program area differences.

The conclusion of this research is that the model is a potentially useful tool for determining the benefits of community college programs and that there is some validity for applying a social indicator model to educational subsystems.

It can be further concluded that some relationships in the model do not emerge in a pilot study that includes only a small student sample and a small sample of institutions. An example of such a situation is that related to hypothesis 1. In these instances, in-depth research efforts are necessary.

CHAPTER VI. SUMMARY

Purpose of the Study

The purpose of this study is twofold; the first is to present a conceptual model developed by this researcher as one alternative for assessing the benefits derived from community college programs. The second purpose is to test selected relationships from the model in order to determine its feasibility as a tool for policy and decision-making at the local college level and at the national level.

Description of the Model

The model consists of nine figures based on a "quality of life" orientation that begins with an abstract global level of social indicators and proceeds to the lowest level of specific educational indicators. Thus, the model reflects the "top-down" hierarchical approach often used in systems analysis whereby each subsequently lower level acts as the apex for increasingly more restrictive hierarchies.

Figures #1 and #2 of the model depict the position of the institution of education within the "quality of life" hierarchy and the position of the community college within the educational system. Figure #3 depicts the six program areas offered by community colleges in this country. Figures #4 through #9 identify those input and

output variables significant to each of the program areas. Most of the input items, although not all, reflect the data usually accumulated in studies on education. The development of the output variables required specification of significant and measurable proxies for abstract educational goals such as "learning", "responsible citizenship", and "values".

Design of the Study

Data for this research effort was gathered from the official files of Marshalltown Community College, a rural college in central Iowa; from William Rainey Harper Community College, located in a Chicago suburb; and from Cuyahoga Community College (Metro Campus), located in downtown Cleveland. Forty full-time students (students enrolled in 12 or more hours) from each of the two program areas of College Parallel and Career Development enrolled during the Fall of 1968 at each of the three institutions was systematically drawn for a total student sample size of 240. The faculty sample included all instructors who taught half-time or more in either the College Parallel or Career Development program.

Four major hypotheses were tested inferentially by testing a series of sub-hypotheses directly related to the major hypothesis under consideration. The major hypotheses are:

Major Hypothesis 1 The model presented is a feasible tool for visualizing the existence of relationships between those resource variables going into specific program areas of a single community college (inputs) and the results coming out of the program area (outputs).

Major Hypothesis 2 The model is effective as a tool for evaluating the extent and direction in which community college goals are being achieved at the community college district level.

Major Hypothesis 3 The model is an effective tool for determining if institutional emphasis on a single program exists at the local college level.

Major Hypothesis 4 The model is a useful tool for evaluating the extent and direction to which community college goals are being achieved at the national level.

Findings

In order to test the first major hypothesis, an effort was made to determine if a relationship exists between the input variable of student/faculty ratio and the College Parallel output variables of program completion, application and transfer to a 4-year college or university, and length of stay at the 4-year institution. A similar effort was made in relation between the student/faculty ratio in the Career Development program and program completion, and the type of initial and current job placement of Career Development students. Examination of the data provide some evidence to support the rationale that lowering student/faculty ratios in these two program areas affects the immediate and the future behavior of students in terms of meeting the program goals of the college. Complete relationships between the input variable of student/faculty ratio and the output variables were not always observed. For example, doubling the student/

faculty ratio did not result in significantly reducing the number of students who completed either program. The findings indicate that the model "completely" reflects the relationship between student/faculty ratio and college program completion rate and between student/faculty ratio and College Parallel transfer rate. The model points to the existence of possible trends between student/faculty ratio and application by College Parallel students to 4-year institutions, length of time these students remain at 4-year institutions and the type of initial and current job placement of Career Development students. There is, therefore, some support for use of the model in visualizing the relationship between these inputs and outputs of the community college.

Test of the second major hypothesis requried a comparison between enrollment in the College Parallel and Career Development programs and the community population along the parameters of age, sex, race, and socio-economic level. In every instance, it was discovered that community college enrollments reflect almost completely the traditional college-aged student (from 18-22). In every instance but one, the female population was significantly under-represented in college enrollments and with only one exception, the low socio-economic group of the community was not reflected in the college enrollments. Comparison between college enrollments and community population according to race was limited in this research project because the samples from two of the colleges contained no non-Caucasian students. Since the same college districts contained few if any non-Caucasions, this finding is not surprising. Thus, the model provides a method

for determining which of the various sub-populations within the community are being served directly by the College Parallel and Career Development programs.

The third major hypothesis was tested by comparing the inputs of the two college programs within a single institution. The input items included the student characteristics of age, sex, race and socio-economic level, student/faculty ratios, and faculty salaries. Examination of the data reveal that, with only one exception (age, in the College Parallel program at one college) there was no difference in the characteristics of students enrolled in the College Parallel programs and those enrolled in the Career Development programs. Findings related to the assignment of faculty to the two college programs reveal that in every instance, a lower student/faculty ratio exists in Career Development programs than in College Parallel programs. The data further reveal that there is no significant difference between the salaries paid to College Parallel faculties and salaries paid to Career Development faculties. The model, thus provides an effective tool for determining if institutional emphasis on a single program exists at the local college level.

Inter-institutional comparisons provided the basis for testing major hypothesis four. Specifically, comparisons among the institutions were made to determine if the colleges were similar with respect to: student enrollments in the College Parallel and Career Development programs (inputs), students who transferred to 4-year institutions (outputs), and students who are currently employed in the field in which they were trained (outputs). The findings reveal a difference

among the three colleges in the age, sex, and race of student enrollments but no significant difference in the socio-economic level of student enrollments. Further, differences among the colleges were found in the age, race and socio-economic status of students transferring to 4-year institutions, but not in the sex of the transferring students. No institutional differences were found in the age, sex or socio-economic level of students who continue to be employed in the field for which they were trained at the college. Thus, use of the parameters indicated by the model has made visible several similarities and several dissimilarities that exist in the inputs and outputs of the community colleges under study. Although data on the inputs and outputs of Career Development programs is similar enough to make aggregated data at the national level a valid indicator of community college goal attainment, such is not the case for data on College Parallel programs. Use of the parameters indicated in the model has shown the extent and direction of goal attainment across the three institutions.

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APPENDIX

College_____

STUDENT DATA SHEET

1. Student Name_____
   Parent's Name_____Address_____Phone_____

2. Age: _____ 3. Sex: _____ 4. Race: Cauc.___Black___Amer Indian___
   Spanish Amer___Oriental___Other___

5. SES: _____Receives financial assistance from home
   _____Filed with institution for financial aide
   _____Direct loan from other source
   _____Works during school year
   _____Works during summer

6. Holds high school diploma: Yes____ No_____ 7. Holds G. E. D.: Yes____ No_____ 8. Enrolled in: C.P.___ C.D.___

9. Student Classification: Freshman____ Sophomore___ 10. Year left CC_____

11. Reason for leaving CC:
    Drop-out_____
    Employment___
    Military_____
    Transfer to 4-year institution____

12. Total length time at CC:_____

13. Completed program:
    Yes_____
    No_____

C. P. Students

14. Applied to 4-year institution: Yes____ No_____

15. Transfered to 4-year institution: Yes____ No_____

16. Length of time at 4-year institution:
    Less than one year____
    One year____
    Two years____
    Three years____

Transfer to 4-year institution____

C. P. Students

14. Applied to 4-year institution: Yes____ No____

15. Transfered to 4-year institution: Yes____ No____

16. Length of time at 4-year institution:
Less than one year____
One year____
Two years____
Three years____
Graduation____

C. D. Students

17. Type of C. D. training_____

18. Length of initial job placement:
Less than one year____
1-2 years____
2-3 years____
3-4 years____
4-5 years____

19. Type of initial job placement:
Employed in same area as training____
Employed in different area from training____
Further training in same area as training____
Training in different area from training____
Military service____
Unemployed____

20 Length of current job placement:
Less than one year____
1-2 years____
2-3 years____
3-4 years____

21. Type of current job placement:
Employed in same area as training____
Employed in different area from training____
Further training in same area as training____
Training in different area from training____
Military service____
Unemployed____

FACULTY DATA SHEET

1. Name:_____ 2. Age:_____ 3. Sex:_____ 4. Race: Cauc_____
Black_____
American Indian_____
Spanish Amer_____
Oriental_____
Other_____

5. Teaches at least 1/2 time in: C. P._____
C. D._____

6. Salary:_____
(1968)

Community College:_____

FACULTY DATA SHEET

1. Name:_____ 2. Age:_____ 3. Sex:_____ 4. Race: Cauc_____
Black_____
American Indian_____
Spanish Amer_____
Oriental_____
Other_____

5. Teaches at least 1/2 time in: C. P._____
C. D._____

6. Salary:_____
(1968)

Community College:_____