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ABSTRACT

Recently the public has grown increasingly verbal, through its elected representatives, in demanding some evidence of the effectiveness and efficiency of the institutions of higher education. This has resulted in tighter restrictions on the educational dollar, causing most administrators to look for ways to become efficient as well as effective in operating educational programs. Increasing emphasis on Program Planning and Budgeting Systems (PPBS) as a methodology for analyzing financial needs has forced educators to seek, for the first time, measurable outputs related to the institution's basic purposes. Data from exemplary community colleges were analyzed to: (1) identify and investigate institutional and community input variables, and specified community college output variables, (2) determine relationships between input and output variables, and (3) seek to identify implications of existing relationships. The primary purpose of the study was (1) the identification of significant variables existing in real situations, (2) discovering relationships among the variables, and (3) laying a groundwork for later, more systematic and rigorous testing of hypotheses. Spearman rank order coefficients of correlation were calculated relating each input with each output variable, and the level of significance of each coefficient was determined. A number of conclusions and implications based on the study, are discussed.
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AN INPUT-OUTPUT STUDY OF
SELECTED COMMUNITY JUNIOR COLLEGES

By

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Institute of Higher Education
University of Florida
Gainesville, Florida

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FOREWORD

The tighter restrictions on the educational dollar have caused most administrators to examine ways to become more efficient as well as more effective in the operation of educational programs. The increasing emphasis upon Program Planning and Budgeting Systems as methodology for analyzing financial needs has forced many educators to seek for the first time "outputs" which are measurable and which are related to basic purposes of the institution. A number of studies have attempted to establish relationships between inputs on one hand and outputs on the other. None has achieved noteworthy success.

Dr. James Matthews has studied "exemplary" community colleges ex post facto in this analysis. He has thoroughly analyzed the data and has developed several interesting conclusions which should be valuable to budgetary decision makers. While a cause and effect relationship cannot be examined with confidence, there is some significance to the relationships he identifies herein.

We are appreciative of the cooperation of the National Educational Finance Project and the Satellite Study No. 6 on community colleges in helping to make this study possible. We are also indebted to the W. K. Kellogg Foundation for partial support of this and other studies of interest to state level staffs. Dr. Dayton Y. Roberts has provided very valuable help in preparing this monograph for publication. It is part

of a series of studies which are devoted to improving higher education
with special attention to the community colleges.

James L. Wattenbarger, Director
Institute of Higher Education
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October, 1971

CHAPTER I

INTRODUCTION

Education in a democracy must provide equality of educational opportunity for each individual if the philosophical commitments of that society are to be met. The acceptance of this commitment in the United States has resulted in a concept of American education which is clearly distinguishable from concepts of education found in many other countries of the world. Thus, education in this country is directed toward meeting the needs of all people rather than providing for the needs of a privileged elite.

While the concept of universal educational opportunity has been associated historically with elementary and secondary education, this nation seems to be moving toward an acceptance of this concept in the area of higher education. The democratization of higher education is reflected in the increase of college enrollments during the past seventy years. In terms of population of college age, four per cent were enrolled in 1900 while 40 per cent were enrolled in college in 1966. Chambers predicted that this percentage would approach 75 per cent by 1977 (4:5-13).

The tremendous influx of new students has necessitated a concomitant expansion of the institutions of higher education. A large portion of the expanding enrollment of college students has been accommodated by the development and growth of the community junior college. In 1900, only eight junior colleges were established with a total enrollment of 100.

students. Today, approximately 1,200 community junior colleges enroll almost 2,500,000 students. Nationally, one-third of all beginning college students start their collegiate careers in a community junior college. Thus, the expansion of the community junior college has helped alleviate some of the problems of increased enrollments that faced four-year colleges and universities and it has also provided educational opportunities for many young people who might have been denied these opportunities otherwise (8:4-6).

While this phenomenal growth was occurring, the community college was also undergoing an evolution in role and function. The community junior college was conceived first as a separate institution offering the first two years of baccalaureate curriculums. The junior college of that day evolved from a single purpose institution into the comprehensive multi-purpose community junior college which attempts to provide: 1) university parallel courses, 2) occupational education, 3) general education, 4) continuing education, and 5) community service. As a result, many persons look to the community junior college as the vehicle by which universal educational opportunity in higher education may be provided for all persons who can profit from higher education.

Current political and economic conditions in this country emphasize the pressing need for considerable research related to the financing of higher education. Various sectors of our society are insistently presenting demands on all levels of government for a greater portion of the tax dollar to support a variety of programs. At the same time this competition for financial support is increasing, the needs of the institutions of higher education, particularly, the needs of the junior college, are

multiplying due to the tremendous growth in enrollment. The public, through its elected representatives, is demanding some evidence of the effectiveness and efficiency of the institutions of higher education. While the available tools of research may not allow as precise measurements as we would like, the need to measure those aspects of the input-output relationship which we are capable of measuring is apparent. As Chambers stated:

In a very real sense, the efficiency of a college or university today cannot be measured until half a century hence, when today's students will have played their roles in life. But the public cannot wait fifty years for a report on which to base this year's decisions. (5:84)

While the community junior college has been the object of some recent research dealing with input-output relationships, most of the emphasis has been placed upon a single function of the junior college, the transfer function. Thus, the community junior college, a recognized comprehensive institution, has been treated comprehensively only rarely in research concerning input-output relationships. The research reported herein attempted to overcome this noted deficiency.

CHAPTER II
REVIEW OF RELATED LITERATURE AND RESEARCH

The related literature and research were reviewed to give direction to the study through the identification of an appropriate model for research as well as appropriate variables to be investigated.

Input-Output Concept

Cost-quality analysis, input-output analysis, operations research, efficiency studies, optimization, and systems analysis are terms that have frequently been applied to business and industry in this nation. While the methods and procedures implied by these terms are often applied to the business and industrial sector, many educators reject their use in an educational setting. However, as the size of the educational enterprise has grown, there has been increasing pressure, both inside and outside the profession, for more effective evaluation of the educational process and product. Russell emphasized the need for institutions of higher education to institute economies of operation and at the same time to improve the quality of their service. He suggested that more institutional research was needed to accomplish this two-fold task (21:301).

It appears evident that if institutions of higher education are going to receive increasing financial assistance from legislative bodies, they must perform more research related to cost-quality concept. Of the various industrially oriented ideas of analysis, the input-output model seems the most applicable to education. The general input-output model suggested by

Swanson may be adapted readily to a community junior college (24:152-53). While Swanson dichotomized the input variables into controllable and non-controllable groups, it would appear to be more realistic to view these input variables as distributed along a continuum from controllable to non-controllable. Examples of variables that are under a greater degree of control by a community junior college would include: amount of local tax levy, allocation of funds to various programs, personnel policies of the college, utilization of available space, and numerous other administrative decisions. Examples of input variables that are under a lesser degree of control are largely environmental in nature and would include: state and federal influences, the human resources of the community, the economic resources of the community, the educational level of the community, the kind and distribution of work skills in the community, as well as other significant characteristics that Mort described as community and educational climate (17:201-14).

The interaction of the nearly infinite number of input variables in the community and institutional setting produces a variety of output variables. One of the purposes of input-output research is to identify specific significant input variables and certain output variables that relate to the stated goals of the organization and then determine the relationships between these variables. That was the purpose of this study.

Input Variables

The related literature was reviewed in order to identify significant input variables. The number and variety of these variables present in a

community junior college are considerable and any attempt to identify and categorize all such variables would be a monumental task in itself. Thus, this review is limited to those input variables that have received prominent mention in the literature. These input variables fall into two categories: those of an institutional nature, and those related to the community. A number of institutional variables are financial and relate to expenditures in certain specific areas.

Early in the junior college movement, Koos (13:20-24) and Eells (6:202) noted that superior instruction was one of the hallmarks of the junior college. From that time to the present, teaching has been perceived as the primary role of the junior college. As Thornton pointed out:

Universities may become great through research, through publication, through opportunities for graduate study, but the community junior college can attain its local renown and the affectionate esteem of its alumni only through the effectiveness of its educational program. Either it teaches excellently, or it fails completely. (25:41).

Thus, the expenditure of funds to employ instructional personnel was identified as a significant institutional input.

Most community junior colleges are philosophically committed to an "open door" admission policy. As a result, the student body is extremely diverse. To accommodate this diverse student enrollment, the community junior college has developed a broad curriculum to meet the varied needs of the students. The task of bringing the student and the curriculum into a harmonious relationship becomes the responsibility of student personnel services. The student personnel worker must help the student to understand himself better and he must also inform the student of the educational opportunities that are available. The informed student then should be able to make an intelligent and realistic decision concerning his

educational future. Thornton (25:Chapter 17), Johnson (11:Chapter 4), and Raines (19) have emphasized the importance of student personnel services if the community junior college is to accomplish its educational mission. Therefore, student personnel services expenditures appeared to be a significant institutional input.

Traditionally, the library has been considered the center of learning in any institution of higher education. The library was often looked upon as a significant index of the quality of the institution. The comment by Eells is typical:

To do real college teaching, according to present methods, a well-stocked library, closely related to the subjects of instruction, is indispensable. It should be the throbbing heart of the junior college, as well as of the university. The mental and moral vigor of the institution rises or falls with the efficiency of the library (6:445).

While libraries have recently undergone a revolution in function in which the library is conceived more as a media center than a traditional library, the library remains a key element in the community junior college. Johnson (11:340), Wheeler (26:5), and Fusaro (7:40) emphasized the importance of the role of the library in the operation of a community junior college. Library services expenditures, then, were considered a significant institutional input.

The literature contains many references concerning the important role the college president plays in determining the success or failure of the institution. He must provide leadership and establish the educational climate necessary for the college to flourish. A number of writers emphasized that the most important responsibility of a board of trustees was that of selecting a president (20:19) (14:75) (27:16). Since the president plays such a pervasive role in determining success or failure of the educational

enterprise, the expenditure of funds to employ him was considered a significant financial input.

The size of an educational institution has been cited frequently as an important determinant of educational quality. Larger educational institutions are able to provide broader, more comprehensive programs of studies for their students. Shelley (22), Moore (16), and Pike (18) all reported that institution size was related to educational quality or output. Thus, the institution size was identified as one of the institutional input variables.

The subject of the source of income of community junior colleges has received attention from several authorities. The degree to which college students should support the costs of the college operation through tuition and fees is a question open to controversy. Henderson indicated that there were two basic conflicting views on the subject. Some believe that students should pay a large share of the cost of their education while others believe that society should pay for all or most of the costs of higher education (9:202-03). Chambers stated the basis for the contrasting views concisely:

One must choose between the concept of higher education as primarily a private consumer's good, to be purchased and paid for individually, and the contrasting view of higher education as principally a benefit to the whole society and therefore an ideal object of productive public investment. More briefly, the choice is between tuition-free support and tax support. (4:176-78).

Another point that brings about disagreement concerns the degree to which the local community should support financially the efforts of the community junior college. As Chambers pointed out, the major support for junior colleges is moving from the local level to the state. A number of authorities oriented to the concept of the community college feel that this trend is unfortunate as they see the need for extensive local involvement if the college is to serve the needs of the community fully (4:176-78).

Authoritative writers have dealt with the question of the appropriate degree of financial support from tuition and fees as well as the degree of financial support from the local community on a philosophical level. The foregoing discussions appeared to warrant the inclusion of those factors as significant institutional inputs.

A number of recent studies have recognized that the output of an educational institution is related to the socio-economic characteristics of the community served. The primary source of information concerning various social and economic characteristics of the population has been the U.S. Bureau of the Census. Therefore, most studies dealing with demographic data have utilized categories found in publication of the U.S. Bureau of the Census. Recent studies of Atwell (2), Moore (16), and Burkhead (3) have indicated several significant community input variables. Economic characteristics such as income level and type of employment have been found to be significant correlates of educational output. Likewise, social characteristics such as level of education and racial mix of the population have related significantly to educational output.

Output Variables

The output variables of a community junior college are numerous and varied. Some of these variables are elusive, difficult to identify, and impossible to quantify, while others may be isolated, identified, and analyzed. The output variables considered in this study were limited to and selected from those which relate to certain generally accepted purposes of the junior college.

When the literature concerning the purposes of the community junior college is examined, there are variations in numbers of purposes and variations in terminology, but certain general purposes seem to be found in most lists (10:69) (25:59) (15:Chapter 3). These usually include:

1. College parallel or transfer
2. General education
3. Vocational-technical or occupational
4. Continuing education and/or community service.

While other worthwhile and defensible purposes may be identified, there does seem to be rather general agreement upon these four purposes. This study was a part of the Community Junior College Finance Study--a satellite of the National Education Finance Project. One of the criteria used to select the sample of junior colleges in the satellite study stated that the junior college must be comprehensive; that is, the junior college must offer programs in each of the following areas: college-parallel, occupational, and continuing education. Therefore, output variables relating to these three purposes were used in the study.

Related Research Studies

Four studies were reviewed that pertained directly to the input-output concept at the junior college level. Simms, concentrating on the transfer function of the junior college, investigated the relationship between certain junior college institutional characteristics and the academic performance of the transfers in the State University System of Florida. None of the variables or variable combinations which included only

institutional predictors were significant at the .05 level. Only when lower division grade point averages and standardized test scores were used as predictor variables, were statistically significant correlations observed. Simms concluded that institutional characteristics used in his study were not significant predictors of upper division grades (23).

Atwell, also concentrating on the transfer function of the junior college, attempted to identify certain institutional and community characteristics which tended to be related to the effectiveness of junior college transfer programs. He reached the following conclusions:

1. Socio-economic status characteristics played a significant role in transfer effectiveness.
2. Qualities of the districts' public school system were significant predictors of transfer effectiveness.
3. Certain institutional characteristics were found to be strong discriminators of transfer effectiveness including faculty salary, teacher preparation, clerical help for teachers, and actual number of library holdings per FTE (2).

Pike, in a study of Texas public junior colleges, analyzed the relationships of current expenditure, enrollment, and expenditure per student to 72 variables which he found to be associated with educational quality. He noted consistent correlations between the criterion variables and the instructor, physical plant, and library material variables. He also found certain basic variables to be closely related to current expenditure and enrollment for all groups of schools. Pike observed that enrollment was closely associated with the educational program; the small junior colleges were not offering comprehensive programs (18).

Alkin and Hendrix conducted a study of input-output relationships in a sample of fifteen junior colleges in California. They studied the relationships between financial input and selected output measures while maintaining statistical control for variations in community characteristics. Of the seven output variables, one related to the vocational program, while the other six related to the college-parallel program or some internal output measure, such as the percentage of enrollment placed on probation. These researchers found that while financial input variables did account for some of the variations in the output variables, the community variables showed the strongest relationship to output variables (1).

The review of related literature and research served two purposes. First, it clarified the need for additional research. Secondly, the review gave direction to the study through the identification of an appropriate model (input-output) for research as well as the identification of appropriate variables to be investigated.

CHAPTER III

THE STUDY

The purposes of this study were to: 1) identify and investigate certain input variables of two types, institutional and community, and specified output variables of the community junior college, 2) determine relationships between the input variables and the output variables, and 3) seek to identify the implications of any relationships that may exist. Since this investigation was an exploratory field study, it was designed to 1) identify significant variables as they exist in a real situation; 2) discover relationships among the variables; and 3) lay a groundwork for later, more systematic and rigorous testing of hypotheses (12:388).

As the result of a survey of authoritative literature and research studies, the following institutional input variables were identified for investigation:

1. Instructional salaries expenditure as a percentage of current educational and general expenditure. (I_1)
2. Instructional salaries expenditure per FTE. (I_2)
3. Student personnel services expenditure as a percentage of current educational and general expenditure. (I_3)
4. Student personnel services expenditure per FTE. (I_4)
5. Library services expenditure as a percentage of current educational and general expenditure. (I_5)

6. Library services expenditure per FTE. (I_6)
7. President's salary expenditure. (I_7)
8. Current educational and general expenditure per FTE. (I_8)
9. Size of institution (FTE). (I_9)
10. Revenue derived from tuition and fees as a percentage of total current revenue. (I_{10})
11. Revenue derived from local sources as a percentage of total current revenue. (I_{11})

The following socio-economic characteristics of the population of the junior college district that act as community input variables were identified for investigation:

1. Per capita income of the district population. (C_1)
2. Percentage of district population classified as non-white. (C_2)
3. Percentage of district population, twenty-five years old or over, having completed less than five years of school. (C_3)
4. Median school years completed, persons twenty-five years old or over, or residents of the district. (C_4)
5. Median family income in the district. (C_5)
6. Percentage of population in the district whose annual income is in excess of \$10,000. (C_6)
7. Percentage of district population employed in white-collar occupations. (C_7)

The following output variables which attempt to quantify operationally the output related to three of the basic purposes of the junior college were identified for investigation:

1. The percentage of full-time freshmen, college-parallel students, enrolled in the fall session, 1967, who had successfully completed their course of study prior to the fall session, 1969.
2. The percentage of full-time freshmen, college-parallel students, enrolled in the fall session, 1967, who had successfully completed their course of study and had taken steps to enter an upper division institution as indicated by the transmittal of transcripts to one or more such institutions prior to the fall session, 1969.
3. The percentage of full-time freshmen, occupational students, enrolled in the fall session, 1967, who had successfully completed their course of study prior to the fall session, 1969.
4. The percentage of full-time freshmen, occupational students, enrolled in the fall session, 1967, who had become employed on a job related to their training prior to the fall session, 1969.
5. The percentage of the population of the district served by the junior college who had enrolled in at least one course, workshop, conference, or any other educational activity under the auspices of the junior college that required some form of registration during the 1968-69 school year.

Since this study was a part of the Community Junior College Finance Study--a satellite of the National Education Finance Project, the sample of junior colleges selected for investigation by the staff of the Study was utilized in this particular study. Certain criteria were developed to assist in the selection of the institutions to be a part of the sample. States were selected on the basis of the following criteria:

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1. A system of junior colleges must have been in operation for at least three years.
2. At least 50 per cent of the population of the state must be within commuting distance of a junior college.
3. The state must provide a sound legal basis for the establishment of junior colleges.
4. There must be a state-wide master plan for the development of junior colleges.
5. The junior colleges must be comprehensive in nature.
6. The state must provide financial support for at least 30 per cent of the current operating expenditures.
7. The states should be geographically representative of continental United States.

Once the states were selected, a panel of authorities from each selected state was asked to name several junior colleges (no more than five) within the state that exemplify excellence in junior college education. The following criteria served as guidelines for the selection of individual institutions:

1. The junior college must provide college-parallel, occupational, and continuing education programs.
2. The institution must practice an open-door policy for enrollment.
3. It must be recognized by the regional accreditation agency.
4. It should serve its target population in its district to the fullest extent.
5. The junior college must offer guidance and counseling services to its students.

These responses were analyzed by the directors of the study. As a result, fifteen junior colleges were selected for intensive study.

Data, in the form of a variety of reports, records and schedules were obtained from each of the institutions. These data were analyzed thoroughly in order to obtain the basic information needed to calculate institutional input variables and output variables. Demographic information needed to calculate community input variables was obtained from publications of the U.S. Bureau of the Census. Next, these data were compiled according to each junior college, each input variable, and each output variable. Spearman rank order coefficients of correlation were calculated relating each input variable with each output variable. The level of significance of each coefficient thus obtained was determined by a comparison with a table of critical values.

While data indicating the levels of each variable in each junior college are too extensive to be reported in this publication, data indicating relationships between input and output variables are reported in two tables. Information presented in Table 1 (Page 18) shows correlation coefficients relating institutional variables with output variables. Correlation coefficients relating community variables with output variables are presented in Table 2 (Page 19).

TABLE 1
CORRELATION COEFFICIENTS RELATING
INSTITUTIONAL VARIABLES WITH
OUTPUT VARIABLES^c

Institutional Variables	O_1	O_2	O_3	O_4	O_5
Instructional Salaries/ Ed. and Gen. (I_1)	-.41	-.28	.37	.56 ^a	.35
Instructional Salaries/FTE (I_2)	.13	.10	-.68 ^a	-.50	-.03
Student Personnel Services/ Ed. and Gen. (I_3)	.61 ^a	.50	.52	-.30	-.13
Student Personnel Services/ FTE (I_4)	.65 ^a	.57	-.22	-.75 ^a	-.21
Library Services/Ed. and Gen. (I_5)	-.58 ^a	-.56	-.48	-.14	-.23
Library Services/FTE (I_6)	-.17	-.20	-.83 ^b	-.55	-.25
President's Salary (I_7)	-.12	.03	-.38	.15	.18
Ed. and Gen. Exp./FTE (I_8)	.15	.05	-.72 ^a	-.47	-.17
FTE (I_9)	-.35	-.48	.07	.14	.53 ^a
Tuition and Fees/Total Revenue (I_{10})	.18	.13	-.60 ^a	-.31	-.28
Local Revenue/Total Revenue (I_{11})	.03	-.08	.02	.02	.21

^aSignificant at .05 level

^bSignificant at .01 level

^cOutput variables defined on page 15

TABLE 2
CORRELATION COEFFICIENTS RELATING
COMMUNITY VARIABLES WITH
OUTPUT VARIABLES^b

Community Variables	O ₁	O ₂	O ₃	O ₄	O ₅
Per Capita Income (C ₁)	.04	.01	-.37	.13	-.16
Non-white (C ₂)	-.35	-.38	.40	.02	.56 ^a
Less than 5 Yrs. School (C ₃)	-.02	-.07	.35	-.18	.19
School Yrs. Completed (C ₄)	.03	.03	-.31	-.04	-.04
Family Income (C ₅)	.25	.24	-.26	.07	-.32
Income over \$10,000 (C ₆)	.14	.08	-.37	-.15	-.08
White-Collar Occupations (C ₇)	-.19	-.28	-.27	-.09	.13

^aSignificant at .05 level

^bOutput variables defined on page 15

CHAPTER IV
SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Summary of Findings

While the primary focus of this study was upon the relationships between input variables and output variables, two summary observations concerning the variables are noted. First, there was a wide range among the institutions in the level of each of the variables. As an example, the expenditure per FTE of the highest to the lowest college produced ratios of greater than two to one for instructional salaries and educational and general expenditures, four to one for student personnel services, and seven to one for library services. Similarly, large ratios were evident when other input and output variables were analyzed.

The other observation concerned the lack of available information relating to output variables at some of the colleges. Complete information from all of the institutions was available for only one of the output variables, percentage of the junior college district population which participated in the educational program of the college. Information concerning two of the variables, percentage of college-parallel completions and percentage of occupational completions, was available for 73 per cent of the institutions. Information concerning the other two variables was available from only 67 per cent of the colleges.

Significant positive relationships were found between the following sets of variables:

1. Student personnel services expenditure per FTE with college-parallel completions.
2. Instructional salaries as a percentage of current educational and general expenditure with occupational employment on related jobs.
3. Student personnel services expenditure as a percentage of current educational and general expenditure with college-parallel completions.
4. Size of institution with percentage of district population who are registrants of the junior college.
5. Percentage of non-white population with percentage of district population who are junior college registrants.

Significant negative relationships were found between the following sets of variables:

1. Instructional salaries expenditure per FTE with occupational completions.
2. Student personnel services expenditure per FTE with occupational employment on related jobs.
3. Library services expenditure as a percentage of current educational and general expenditure with college-parallel completions.
4. Library services expenditure per FTE with occupational completions.
5. Current educational and general expenditure per FTE with occupational completions.

6. Percentage of total revenue derived from tuition and fees with occupational completions.

The investigation of data in this study gave impetus to speculation that a number of underlying, concomitant variables were operating among the identified input and output variables. Three such variables were identified for investigation. Each was found to be significantly related to one or more of the input or output variables. These concomitant variables were:

1. Age of the institution in years.
2. Ratio of college-parallel beginning freshmen to occupational freshmen.
3. Ratio of number of full-time equivalent students (FTE) to the total number of registrants.

Conclusions

A number of conclusions, which pertain to the community junior colleges in this study, appear to be warranted based upon the investigations of this study. These conclusions are discussed in the paragraphs which follow.

The concept of accountability is not uniformly and universally accepted among the junior colleges in this study. Although the institutions were selected to exemplify excellence in junior college education, one-third of the colleges did not have information available to indicate how many beginning freshmen completed their course of study and took steps to enter an upper division institution, or how many occupational students became employed on jobs relating to their training. A full 27 per cent of the

institutions did not maintain records to indicate such elementary information as the percentage of beginning freshmen who successfully completed their course of study. A few of the junior colleges did maintain rather extensive records indicating program costs. Some colleges attempted to determine how successful they were in meeting their stated objectives along with the cost per student required to meet their objectives in the various individual programs. These community junior colleges, however, were the exceptions rather than the rule.

The junior colleges that receive no local financial support tend to meet the needs of their local community to a lesser degree than those colleges that do have local financial involvement. The junior colleges that received no local financial support registered 0.5 per cent or less of their district population in their educational programs, a figure considerably below all of the other institutions. The median for all the junior colleges was more than double that figure, 1.3 per cent.

A number of variables operate in association with the input-output relationships. While a number of input and variables were identified in this study, it is clear that a number of other variables are involved in these relationships. Three such concomitant variables were identified in this study.

More successful occupational programs, in terms of completion rates, are found in the junior colleges that minimize student tuition and fees as a source of income. The significant negative relationship between occupational completions and percentage of total revenue derived from tuition and fees points out this conclusion. It should not be unexpected to find the occupational student succumbing to the pressure of high tuition and fees by dropping out of the program prior to completion.

A surface examination of this relationship would indicate simply that the greater the expenditure per FTE, the lower the rate of occupational completions. A closer examination reveals that the institutions that are expending larger amounts per FTE are the same institutions that are depending more heavily upon tuition and fees. The four junior colleges that receive the highest percentage of their total revenue from tuition and fees are all ranked among the top five colleges in expenditure per FTE. A thorough analysis of the relationship between current educational and general expenditure per FTE and percentage of total revenue derived from tuition and fees would reveal a positive relationship (.70) significant to the .01 level. Thus, the higher expenditure per FTE is being supported in part by a greater dependence on tuition and fees. This greater emphasis on tuition and fees apparently militated against a high completion rate in the occupational programs.

Junior colleges that devote a larger share of their financial resources to student personnel services enroll a larger portion of their students in occupational courses. At the same time, college-parallel students enrolled in those colleges with a relatively high expenditure in student personnel services are more successful in terms of completion rates. While a causal relationship cannot be determined in this type study, an interesting question for speculation and further research is raised. Did the larger expenditure of funds for student personnel services bring about a more comprehensive enrollment of students with the result that students' course choices were more commensurate with their needs and abilities?

The junior colleges tended to have either relatively successful college-parallel programs or occupational programs in terms of the defined

output variables, but not both. This conclusion is reflected in the pattern of positive and negative relationships between individual institutional variables and the college-parallel and occupational variables. Institutional variables that relate positively to college-parallel variable generally relate negatively to occupational variables and institutional variables that relate negatively to college-parallel variables generally relate positively to occupational variables.

The size of the institution is related to the degree to which the community at large is served by the institution. The positive significant relationship between the size of the institution (FTE) and the percentage of the district population who are junior college registrants gives direction to this conclusion. The larger junior colleges serve not only a larger absolute number of persons, but also a greater percentage of the population. Thus, the larger institutions are able to offer a larger number and a greater variety of courses and programs to meet the diverse needs of the residents of the area served.

The level of output of the various educational programs of the junior colleges is more closely related to institutional characteristics than to the characteristics of the community served by the college. Ten significant relationships were found between institutional variables and output variables while only one was found between community variables and output variables. Of the community variables, percentage of non-white population was the only one that related significantly to educational output.

Junior colleges may attain recognition as exemplary institutions, as perceived by authorities in the field, with widely varying degrees of financial support for individual programs as well as the total college

program. The variation in current educational and general expenditure per FTE was greater than two to one between the highest and lowest institutions while the variation in individual programs was as great as seven to one (library services expenditure per FTE). Nonetheless, all of these junior colleges were seen as exemplifying excellence in junior college education.

Implications

An examination of the data and the conclusions drawn from the data suggests a number of implications of this study. These implications are identified and discussed in the following paragraphs.

Community junior colleges with no local financial support had a low level of participation in their educational programs by members of the community. It would appear that administrators in such institutions need to seek other means to bring about active community involvement. Suggested means would include increased use of advisory committees, on-going surveys to determine community needs, increased community service programs to meet identified needs, and active participation in the affairs of the community by the junior college administrators.

Many junior colleges do not implement the concept of accountability. This concept seemed rather foreign to most of the institutions in this study. Considering that the institutions studied were selected as exemplary institutions, it is even less likely that most other junior colleges practice this concept. If it is assumed that the concept of accountability should be applied to junior college education, administrators need to take steps

to develop records, procedures, and necessary tools of evaluation to carry out this concept.

College-parallel programs and occupational programs frequently do not attain the same level of success. Junior college administrators need to be cognizant of a possible bias toward either of these programs by fellow administrators, faculty, and students. A conscious effort to eliminate the isolation of occupational faculty and students from college-parallel faculty and students could prove to be beneficial.

Expenditures in the area of student personnel services appear to be particularly crucial. Six statistically significant relationships were found between student personnel services expenditure variables and output or concomitant variables. Of particular interest, the institutions which spent more on these expenditures had a larger portion of students in occupational courses and a higher completion rate in college-parallel programs. Thus, the junior colleges that provided a greater financial emphasis upon student personnel services had a more comprehensive enrollment of students and a better completion record by college-parallel students. In light of these relationships, it would behoove junior college administrators to analyze the operation of student personnel services to insure that optimum benefits are being derived by the students and the institution.

Lower completion rates in occupational programs were found in junior colleges with higher tuition and fees. While higher tuition charges do provide more money to increase the services and programs offered in a junior college, they may also tend to restrict the continued attendance of a certain group of students. Administrators and trustees should be aware that

increasing tuition charges without the provision of adequate scholarship grants may result in closing the door of the "open-door" college, particularly for those who need it most.

The junior colleges that had the highest expenditures on library services had the lowest completion rates. While it is possible that unidentified confounding variables may be operating in this relationship, certain questions should be raised. How widely is the library being used by students? Do faculty members plan cooperatively with library personnel to obtain optimum benefits? Does the library function as a library in the traditional sense or does it serve as a multi-media center? Each institution needs to determine if maximum utilization of library services is being made.

Small junior colleges do not serve the needs of their communities as well as larger junior colleges. It appears that administrators in small institutions could alleviate this situation somewhat by looking beyond the limited resources of the junior college to meet some of these needs. Individuals and organizations within the community may be willing and able to assist the junior college in meeting its educational goals. The small junior college should be able to meet more community needs in the area of continuing education and community service if it adopts the role of coordinator of community resources.

The socio-economic characteristics of the community served by a junior college relate moderately to the success of the institution. Two related implications emerge from this situation. First, the junior college administrators must be cognizant of the nature and needs of the community. The junior college must gear its programs to meet these identified needs

if it is to succeed. Secondly, administrators of junior colleges located in relatively low socio-economic areas need to recognize that constraints imposed by the nature of the population served may be overcome if the institution presents educational programs designed to meet the identified needs of the community. Furthermore, over a period of time the junior college has the potential to raise the educational and economic level of the community it serves.

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