DOCUMENT RESUME

ED 037 210 JC 700 066

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TITLE Essays on Occupational Education in the Two-Year College.
INSTITUTION Pennsylvania State Univ., University Park. Dept. of Vocational Education.
PUB DATE Jan 70
NOTE 169p.
AVAILABLE FROM Department of Vocational Education, 250 Chambers Building, The Pennsylvania State University, University Park, Penna. 16802 ($2.00)

EDRS PRICE EDRS Price MF-$0.75 HC-$8.55
DESCRIPTORS *Associate Degrees, *Curriculum Design, Disadvantaged Youth, Evaluation Needs, Instructional Program Divisions, *Junior Colleges, Research Needs, *Technical Education, Urban Youth, *Vocational Education

ABSTRACT

The eight essays in this document concern occupational education in the 2-year college. The first two essays present an overview of the community college and its role in providing post-secondary occupational education for contemporary American society. Three essays concern the curriculum for occupational education, emphasizing the needs of urban and alienated youth. The final three essays deal with the future of occupational education, including the future role of the university and the increased need for research and evaluation. A case is made in the final essay for a 6-4-4 configuration of American education, with six years in elementary school, four in secondary school, and four in junior college. The author feels that this configuration reflects the trend toward replacing high school diplomas with an associate degree as the minimum educational certificate. This would have a positive effect on occupational education. (MC)

ESSAYS ON OCCUPATIONAL EDUCATION IN THE TWO-YEAR COLLEGE

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January 1970

Published by:

Department of Vocational Education
The Pennsylvania State University
University Park, Pennsylvania

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PREFACE

This work, a series of eight essays on post-secondary occupational education, is divided into three parts. The first two essays make up the first section and provide an overview of post-secondary occupational education. It begins with an examination of the evolvement of the community-junior college during the past hundred years, with special emphasis placed on the emergence of vocational-technical curriculums in those institutions. The second essay reviews the development of vocational education as a part of post-secondary education in the United States. It is shown that occupational education today, as was the case several generations ago, still has not won the genuine acceptance of either the public or the educational establishment.

The next three essays are devoted to several aspects of curriculum construction. The first of these (A New Approach to Curriculum Construction), presents a dual strategy for the development of new curriculums. This technique surveys both educators and industrialists for those topics within the area of specialization that are expected to be relevant 5 to 10 years from now as well as today. The next essay in this group relates a number of suggestions for inclusion in an experimental two-year college for urban youngsters. This section closes with an essay which deals with the idea of developing a general technician program. The rationale for such a curriculum is that the lower skill levels in the overall technical areas of industry are changing so rapidly that the best preparation for them is to develop a broad understanding of the basic skills that lie behind them. In this way, the student would be introduced to the foundational elements of about eight technical areas, of which he may be called upon to use only several at any given period of employment. But as he moves from one job assignment to another he will find the transition easier because he has some broad conceptions of the skills needed in the new area to which he is moving. Several surveys conducted indicate that industry is very interested in people educated in this way. Ironically, most of the opposition expressed has come from educators.

The last section of the manuscript consists of a group of three essays that more or less look into the future so as to see what it might hold for occupational education in the two-year colleges. First, there is an examination of the role that universities could play. This essay admittedly assigns a rather ambitious role for the universities, but it would seem that it is a role that must be assumed by them or certain aspects of occupational education will go undone. The next essay deals with an area that has received much verbal and very little actual support from the post-secondary institutions, research and evaluation in occupational education. One of the points made in the treatment is that research and evaluation may come as a result of pressures

outside the educational community as the public via its legislatures demand greater accountability of allocated funds. The last essay of the section is a prognosis on the part of this writer of what may lie ahead. It has a slightly somber tone to it, but only because it looks that way to the author.

The essays certainly do not provide the reader with a complete insight into post-secondary occupational education. But they do offer a number of viewpoints on several of the issues that confront vocational education in general and post-secondary occupational education in particular. Since these are essays, the author's philosophy invariably permeates much of the material, and the reader should be aware of this fact. It is hoped that this work makes some small contribution toward the betterment of occupational education as a post-secondary education endeavor.

Angelo C. Gillie

CHAPTER I

THE COMMUNITY COLLEGE: AN INTRODUCTION

A Brief Look Backwards:

It seems that all of a sudden, the American landscape is dotted with two-year colleges - over one thousand of them. Of interest is to look back into the past for a few moments and to determine how and why all this began. Thorton (1:45) indicated that the origination of the two-year college movement in the United States is largely attributable to three major causes. They can be briefly described as follows:

1. The highly vocalized desires of several outstanding university administrators to initiate two-year colleges to serve as "feeders" to the universities.

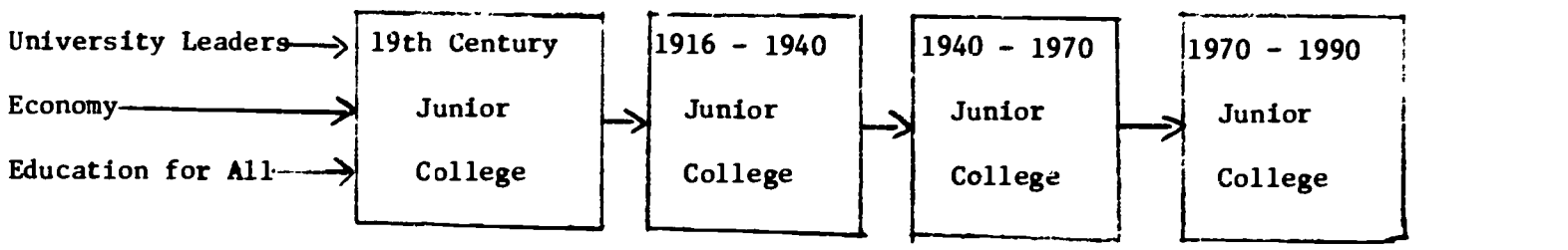
2. The increasing economic wealth of the country (as seen by the rapid rise in the gross national product), thereby making it possible for more people to go to school for longer periods of time.

3. The emergence in strength of that social phenomenon in which Americans came to believe in equal educational opportunities for all.

The above three factors, all moving like vectors in the same direction, produced a resultant interaction in the form of the emergence of this new institution - which was first called the Junior College.* The paradigm of Fig. 1.1 illustrates the origins and the present trends of the junior college movement.

The nineteenth century junior college came into being as an institution for providing the freshman and sophomore years of baccalaureate curriculums (i.e. they served as feeder schools for the universities). There were several university leaders in those times who were vigorously striving for the establishing of junior colleges as institutions to provide the capstone of high school education. In this way, they felt, the universities could more effectively deal with the "real collegiate work." Most of the nineteenth century junior college activists envisioned the two-year college as an extension

*The Junior College did not become a "popular" kind of educational institution until after World War II and the Korean War however. It appears that the popularity presently enjoyed by the two-year college will continue to increase far well into the foreseeable future as the nation enjoys continued economic growth and the public continues to desire college opportunities for all.



CONTINUUM OF THE AMERICAN JUNIOR COLLEGE

Fig. 1-1

of high school for the university-bound youngsters. Several of the leaders in this thrust were Henry A. Tappan of Michigan (2:44), William W. Folwell of the University of Minnesota (3:37), William Rainey Harper of the University of Chicago (4), David Starr Jordon of Stanford University (5), and Alexis F. Lange of the University of California (5:393). The attractiveness of this new kind of institution as an economical way of acquiring two more years of education, since the student could live at home, was another reason offered for establishing junior colleges.

It is of historical interest to note that the oldest public junior college still in operation, according to Eells (6:13), is the Joilet Junior College in Illinois. The associate degree was first awarded by the University of Chicago. That institution granted the Associate in Arts degree in 1900 for the first time. Spindt (7) pointed out that Stanford University in 1910 suggested that the Associate in Arts degree or its equivalent, be made an entrance requirement for that institution. California is the earliest state (1930) to request that the associate degree be conferred upon all junior college graduates.

Serious consideration for including occupational programs in the Junior College had to wait until the twentieth century. Merton E. Hill (8:311-313) states that the first junior college to offer occupational programs was the Chaffey Junior College in 1916. According to Hill, this California institution offered occupational courses in art, agriculture, commerce, farm mechanics, home economics, library work, manual training, and soils. Hill found that there were more than 4000 occupational programs being offered in the year 1941 and that 32 per cent of all junior college offerings were of an occupational nature by 1947.

The introduction of occupational programs marked the second step in the evolution of the junior college into the comprehensive community college. Some of the earliest leaders that proposed the incorporation of occupational programs as part of the junior college curriculum include Lange (9) and Snyder of Los Angeles Junior (now City) college (10). The American Association of Junior Colleges, with a grant from the General Education Board of New York City, conducted a cooperative study of junior college occupational education. This grant resulted in the publication of four volumes (11, 12, 13, 14). In more recent years, the cause of occupational education has been supported by the W. K. Kellogg Foundation. Through one of its grants, an occupational education project has been established by the American Association of Junior Colleges (15). This project has probably done more for the promotion of occupational education in the two-year colleges than any other single force. The Project, with a carefully selected team of highly qualified occupational educational specialists, was designed to assist in the development of occupational programs in the two year colleges on a national basis.

The federal government, in the form of appropriations, has in recent years made a significant contribution to the popularization of occupational education in the two-year colleges. President Kennedy appointed a Panel of Consultants on Vocational Education in 1961 (16:123), and the report of this select group was published in 1962 (17). Included in this report was a recommendation to provide federal support for post-high school occupational education. The following year saw the passage of The Vocational Act of 1963. This bill provided the means for federal funds to be used in certain occupational education programs for the two-year colleges.* The Higher Education Facilities Act of 1963 also earmarked substantial funds for the two-year colleges. The Vocational Education Amendments of 1968 were passed in October 1968. This provides increased funding for occupational education and a portion of it was specifically earmarked for post-secondary vocational education.

The third period in the evolution of the comprehensive community college may be considered as the time since the close of World War II. It was during this period that the role of the public two-year college was expanded to include a total of at least five functions. Medsker (18:vi-vii) described them in this way:

1. providing terminal curricula of two years or less in length;

2. providing curricula preparatory to advanced undergraduate education in four-year institutions;

3. providing general education for all students, terminal and preparatory;

4. aiding students to make educational and vocational choices that are consistent with their individual characteristics; and

5. offering a wide range of general and special courses for adults.

When historians look back at this period of the development of the two-year college, it might be said that the institution moved into its adolescence when it began to expand its role to beyond merely serving as a "feeder" school for the universities and four-year colleges. Of interest is the fact that many two-year colleges

*It is common knowledge however that the great majority of these funds went into the secondary school vocational effort. This writer feels the chief reason for this is that most of the state directors of vocational education were originally secondary people and were chronically suspicious of the emerging two-year colleges.

call themselves "comprehensive" even though the average offering per institution (in 1960) was limited to four occupational programs (1:184). A serious question arises as to whether a meager offering of two to four occupational programs does in fact result in a truly comprehensive community college. The question of comprehensiveness is related to the size of enrollment, since this is related in turn to the financial backing the institution receives. Table I shows the distribution of institutions by enrollment for the years 1965 and 1966.

One can question what the minimum college size would be for operation of a true comprehensive community college. If we consider an enrollment of 3000 full-time students as the minimum size, it is seen (from Table I) that only 127 of the 837 junior colleges listed in 1966 have a large enough enrollment to be able to offer sufficiently diverse programs to qualify for the title of comprehensive community college. How comprehensive are the comprehensive community colleges? Are many of them being unrealistic in their claims of being comprehensive?

ORGANIZATIONAL CHARACTERISTICS OF THE TWO-YEAR COLLEGE

Two-year colleges can be typed in a number of ways. Let us briefly examine their overall characteristics in terms of:

1. finance and control.

2. program offerings.

In terms of finance and control: it is seen from Table I that the ratio of public junior colleges to private junior colleges is about 2/1 (565 to 272 in 1966). All but 33 of the 272 private junior colleges have student enrollments of less than 1000 students, whereas 305 of the 565 public junior colleges have enrollments greater than 1000 students. This indicates that the private two-year colleges, as a group, have smaller enrollments than their public counterparts. The majority of the private junior colleges are found east of the Mississippi River and most of them (61 per cent) are associated with a religious denomination (19:64). The most significant features of the private junior colleges can be itemized as follows:

a. They are often residential, whereas the public institutions are primarily commuter colleges.

b. Private colleges have smaller enrollments.

c. They generally recruit students from a wider geographic area and thereby tend to be less provincial than the public community college (20:120).

Enrollment in Junior Colleges (1967)

ENROLLMENT	PUBLIC		PRIVATE		TOTAL	
	1966	1967	1966	1967	1966	1967
1- 99	5	3	46	48	51	51
100- 199	17	14	41	39	58	53
200- 299	26	28	29	33	55	61
300- 399	38	32	35	32	73	64
400- 499	39	31	24	27	63	58
500- 599	35	46	20	19	55	65
600- 699	27	37	14	15	41	52
700- 799	35	33	13	8	48	41
800- 899	24	26	2	5	26	31
900- 999	24	23	4	5	28	28
1000- 1999	127	160	19	22	146	182
2000- 2999	63	63	7	4	70	67
3000- 3999	35	51	5	5	40	56
4000 4999	28	25	0	1	28	26
5000- 5999	7	17	1	1	8	18
6000- 6999	9	11	0	0	9	11
7000- 7999	5	8	0	0	5	8
8000- 8999	12	7	0	0	12	7
9000- 9999	7	5	0	0	7	5
10,000 & OVER	21	28	0	0	21	28
TOTAL	584	648	260	264	844	912

d. Educational objectives of the private colleges are more limited.

e. Private colleges have a greater opportunity to conduct experimental programs.

The majority of the public two-year colleges are found west of the Mississippi River and for the most part are co-educational. The diversity found in the control and financing of public junior colleges is treated in a later paragraph.

Two-year colleges can also be typed according to their program offerings in the following manner:

1. those that limit their curriculums to the liberal arts and pre-professional courses.

2. those that limit their curriculums to occupational programs only.

3. those that offer liberal arts, pre-professional courses, and certain "college-level" occupational programs.

4. those that, in addition to liberal arts and pre-professional courses, offer occupational programs of great diversity in both academic level and in type of curriculum.

It appears that many community colleges that claim to be comprehensive fall in the third category, and tend to not seriously attempt to meet the educational needs of the less academically attractive youngsters. As an illustration: there are many institutions which offer technology programs that require a prerequisite of two years of high school mathematics, but do not attempt to conduct technology programs at a much lower level. The same trend is seen in the health-related and business programs. When a region or community is served only by this kind of junior college, a large number of post-high school age youngsters are not served. This type of institution often is sensitive about its "image" and vigorously strives to avoid the association of the term "vocational" with any of its offerings by publicizing its occupational courses as "semi-professional" or "para-professional."

The great need for middle-level occupational education programs is demonstrated by the fact that the uneducated and the unprepared are the unemployed. Who should assume the responsibility for educating and preparing the youngsters who are not "college level?" As indicated above, the more conservative element in the junior college camp tends to vigorously resist the encroachment of vocational education into their colleges. Time will tell whether this type of two-year college will become the dominate kind from the four

possible choices. If this should turn out to be the case, then the continuum depicted in Fig. 1.1 will end at the third stage. This would make it necessary for society to establish another educational institution to meet the needs of the lower portion of the middle level group of post-high school age youngsters.*

Happily, there is a fourth type of community college. It is best characterized as one that strives to meet the needs of all post-secondary youth and the region by its willingness (even eagerness) to establish occupational curriculums of any type at any academic level. This breed of junior college generally accepts the role of the area vocational school as another of its functions. Perhaps many of this type of community college, because of its greater viability, will become the model of the mature community college tomorrow.

The control of public junior colleges varies from state to state. The general control patterns most frequently seen are:

a. State Board

b. State University (or State College)

c. County Government

d. Local School Districts

e. Independent Junior College Districts

Great diversity is found within each of these control patterns. Furthermore, some states utilize two of the patterns simultaneously - one for one kind of two-year college (such as the technical colleges) and a second for another type of college (such as the comprehensive colleges). Equally diverse is the method in which junior colleges are financed. Some of the common patterns are:

a. State funds only

b. State, region (county, local school district, or independent junior college district)

*This seems to be already beginning in many places - witness the emergence of the Area Vocational School in most states, which are potentially post-secondary occupational institutions. This point is developed in greater detail elsewhere (see the final chapter).

c. State, region, and tuition (with pro-ration on a prescribed formula - such a 1/3 from each for operational costs and capital costs shared on a 50-50 basis between the state and the region)

d. State and tuition. (Usually a very nominal tuition that covers considerably less than one-half of the educational costs)

The topic of financing raises the question of whether or not students should be charged tuition. In 1962, Martorana (21:40-41) found that only a handful of states incorporated the principle of free tuition in their legislation. Some years before that, the Committee on Legislation of the American Association of Junior Colleges (22) urged that the states include the provision for free tuition in their community college laws. The President's Commission on Higher Education (23: Vol. V, 3) also advocated free tuition for grades 13 and 14.

While the issue of free tuition is being debated, most junior college leaders paid little heed to the fact that community college education effectively rules out the admission of disadvantaged youth in either case (with or without tuition). To simply consider tuition as the chief cost of attending college is to assume the student comes from a home in which his parents subsidize his living expenses. In actuality, living expenses are a greater obstacle to college attendance than the cost of tuition. The federal government took the initiative in addressing this problem in the form of legislation, including the Economic Opportunity Act of 1964. But these attempts are modest at best and the problem remains largely unsolved. There is a belief in many quarters that the cycle of poverty that envelops disadvantaged youth can only be broken by a subsidization of the educational expenses to the extent of providing free room and board, clothing, and health care, as well as tuition.*

Turning now to the administrative patterns found in the nation's junior colleges, it is seen that a considerable amount of diversity exists in the governance aspects of these institutions. The most common patterns all include a Board of Trustees. Of considerable interest and possible implications is the finding of a study by Rauh (61) that public two-year college trustees are more conservative in their governance viewpoints than the trustees of all the other higher educational institutions. With this in mind, one wonders how innovative the two-year colleges can ever hope to be.

*This viewpoint is considered in greater depth in Chapter 4.

The responsibilities of the governing board is customarily spelled out in some state legislative act. In most states, the guidelines set down by the American Association of School Administrators (24:35) are those in use. Rauh (62:439) suggests that trustees would be of greatest use to their colleges if they would assume five basic responsibilities: 1) select the president, 2) evaluate the administration, 3) hold the assets, 4) serve as a court of last resort, 5) maintain a balance between competing constituencies and relate the college to the larger society.

The Board of Trustees employs a college president, who serves as the executive officer of the board. The chief administrative officer sometimes is given the title of director or superintendent in some places. The work of the junior college president can be arbitrarily divided into four broad areas:

1. Institutional
2. Finance
3. Students
4. Academic

The president develops an administrative hierarchy by which he delegates varying amounts of responsibilities in these areas. As in other institutions, not all presidents are secure enough to delegate responsibilities. Generally, the tasks which the president reserves for his direct attention are largely determined by his interests and time. The role of the community college president is a topic waiting to be studied and researched.

Some studies dealing with junior college faculties have been made, but much more remains to be investigated. Medsker (18:172) in 1958, surveyed almost 3000 junior college instructors and found the distribution by academic degrees to be:

doctorate:	9.7 per cent
masters:	64.6 per cent
bachelors:	17 per cent
no degree	6.8 per cent

A study by Gillie in 1967 (25) found the following degree distribution of 186 New Jersey community college faculty:

doctorate:	12.9 per cent
masters:	77.4 per cent

bachelors: 9.7 per cent

no degree: less than one per cent

The New Jersey distribution shows a slightly higher proportion of doctorates and masters degrees than that found by Medsker.

Medsker also found that 64 per cent of his full-time teacher respondents once taught at the pre-college (elementary or secondary) level. Koos' (26) results were essentially the same, and he also found that just over 10 per cent of the faculty were teaching in four-year colleges and universities just prior to their junior college position.

The community colleges, it has been found, attracts students of academic ability that varies from below to above average. The distribution probably varies in accordance with the type of junior college (single purpose, limited purpose, or comprehensive). It is becoming more acceptable to consider the junior college as a suitable institution for students of average ability (16:147). Medsker (18:36) has found that the average academic aptitude level of youngsters entering junior colleges is significantly below that found for students entering the four-year colleges. Also indicated by Medsker (18:36) is that the occupational program students are, as a group, lower in academic aptitude than the transfer students. Data obtained by McDaniel (27) shows that the transfer male students have ACE scores that average 12 points higher than male students in business programs, 16 points higher than male students in technical programs.

The results of several studies show that the socio-economic background of community college students is that they are primarily from the lower half of the socio-economic distribution (18:41, 28, 29). Medsker (18:45-47) also indicated in his findings that only a small portion of the community college students were not high school graduates (six per cent), twenty-three per cent of enrolled students were married, and the male students outnumbered the female students by a three to one ratio.

Many of the community college population characteristics mentioned here should be taken into consideration when attempting to determine the objectives of the institution. They have particular significance at the time when decisions are being made in determining the extent to which the institution will commit itself to program diversity (both in academic level and in curriculum type).

THE SINGLE PURPOSE JUNIOR COLLEGE: LIBERAL ARTS TYPE

It will be recalled, when we reviewed the history of the two-year college movement in the preceding section, that it was found that one of the earliest reasons for establishing junior colleges was to provide the first two years of the baccalaureate programs. An appropriate name for the two-year college that restricts its role to providing transfer programs is the liberal arts junior college.

There are a number of these institutions on the educational scene. Data (for 1966) furnished by the American Association of Junior Colleges (19:12-59) show there were a total of 156 two-year colleges that fall within this category. It is of some interest to note that less than 25 per cent of them are under public control, and just over half of them (84 schools) are church related. The institutions in this categorization enrolled 4.95 per cent of the junior college students in 1966 (which is an insignificant increase of 0.13 per cent over 1965).

Since there are 166 church-related colleges listed (19), a simple subtraction process shows that about half of the church-related two-year institutions are liberal arts junior colleges.

Let us examine the data in another way. More than 40 per cent of the private controlled two-year colleges are liberal arts junior colleges, and less than 8 per cent of public controlled junior colleges fall within the same category. Therefore, it is seen that the liberal arts junior college, at this time, is to be found chiefly in the privately controlled two-year schools. The 1967 total enrollment of the liberal arts junior colleges, using data from the 1967 Junior College Directory, was about 72,500 students. It is found that the majority (about 60 per cent) are in coeducational schools, with another 20 per cent in women's colleges and the remaining 20 per cent in colleges for men only.

It should be noted that the 1966 enrollments in the private junior college sector increased only 4.58 per cent over the preceding year, while public junior college enrollment increases for the same period was 14.31 per cent (19:67). The total enrollment for the liberal arts junior colleges was 62,088 for 1965. Comparing this to the 1966 enrollment shows that the liberal arts junior colleges experienced a 16.7 per cent increase in enrollment during this one year.

The relative small enrollment figures above lead us to the questions: 1) Is the private liberal arts junior college going to disappear in the next few years or decade? 2) Is there a legitimate place in the junior college movement for liberal arts junior colleges in the years ahead? If so, then what can, or what

should be done to retard or reverse the present trend? Answers to these questions might well be in the immediate offering. Several states have made provisions through the legislature in recent years for the allocation of public funds for private colleges. Perhaps this trend will continue to expand such that the private two-year colleges can obtain much needed financial assistance. Many educators feel that a private counterpart in the two-year college movement is of great importance.

THE SINGLE PURPOSE JUNIOR COLLEGE: OCCUPATIONAL PROGRAMS TYPE

There are a number of two-year colleges that restrict their purposes to the offering of occupational type programs. These institutions can be called occupational program type junior colleges or trade and technical junior colleges. In 1967, forty junior colleges were listed in this category (19:12-59), thirty of which are public controlled, and all but one of them are co-educational schools. The total 1965 enrollment for these institutions was 29,887 and the 1966 total enrollment was 35,698. This indicates an increase of 19.44 per cent in enrollment. These colleges had 2.32 per cent of the total junior college enrollment in 1965 and 2.44 per cent of the 1966 total enrollment. It can be seen that they are attracting about the same proportion of the junior college total enrollment. Looking at this figure in still another way, the 0.12 per cent increase in the proportion of junior college students enrolled in these schools from 1965 to 1966 shows that the occupational program community college is barely maintaining its very limited popularity in the overall two-year college movement.

Of further interest is the great amount of change-over of many "technical institutes" into two-year colleges that offer transfer curricula as well as occupational programs. Twenty-seven of these institutions can be readily identified in the 1967 Junior College Directory, while many others have changed their names to include the words community college or junior college. It is obviously more difficult to detect these institutions from the listings in such a Directory.

Henninger (30:4) identified 144 institutions in 1957 that could be classified as technical institutes. It should be noted that the technical institute as an institution has decreased in popularity as the comprehensive community college idea caught fire. It is reasonable to assume that our society now looks to the public community - junior college as the institution in which occupational

programs should be offered.* Venn (16:94) and others believe that the single purpose occupational program type of two-year college will become increasingly uncommon. Assuming they do become truly comprehensive, this trend willcontinue. Most of the single-purpose occupational program types in operation today may very likely become comprehensive (i.e. offer both transfer and occupational curriculums) or discontinue operations.

*It is already obvious in many quarters that there is a tremendous gap between the enunciated policy of the community colleges and what they actually practice. The term "open door admissions policy" is the claim they make for themselves but the realities of the situation show that such is not the case. In many places the institution doesn't really intend to offer the low academic level courses and occupational programs, and they defend their practice by claiming such offerings belong in some other institution and not in higher education. This stance results in a continued void in post-secondary educational opportunities in those places, and that college has failed to address itself to the needs of a large proportion of its community's youngsters. This author feels that such a condition sets the stage for a dichotimization of higher education, with the appearance of another post-secondary institution that will tackle the job avoided by the community college. The final result inevitably will be a less viable community college, relegated to offering transfer type courses to those students not able to gain admission in a university or four-year college. This would be a regression and the term "comprehensive" would be even less appropriate. Many of the community colleges are at these crossroads, with the emergence of the area vocational schools.

THE COMPREHENSIVE COMMUNITY COLLEGE

Because of the limited financial resources with which a junior college must function, it is deemed necessary by many community college educators that the aims of the institution should be made with these limitations always in mind. But the goals of a local two-year college are often determined in no small part by the socio-political atmosphere that pervades the region. Blocker states that it is possible to classify American thought into four basic categories: reactionary, conservative, liberal, and radical (31:6-12). The four positions can be briefly described as follows:

1. Reactionary: This group of people feel that the function of education is to teach the classics, and to develop ability to solve life's problems.

2. Conservative: Members of this group also emphasize the importance of transmitting the culture, but they tend to be more flexible in making modifications than those in the reactionary group.

3. Liberal: People in this group are sensitive to the changing needs of society, and the need of truly egalitarian education.

4. Radical: Members of this group are the most sensitive of all to the need for change. They tend to emphasize innovation and experimentation.

It is suggested that the manner in which objectives for an emerging community college are selected has very much to do with the kinds of individuals that make up the Board of Trustees and the community at large. For example: A relatively wealthy suburban region, with a preponderance of people in the reactionary and conservative groups, would tend to decide on placing heavy emphasis on the liberal arts and pre-professional programs, and assign a role of secondary importance to occupational programs. Furthermore, this type of community would be prone to restrict the few allowable occupational programs to those that are considered "college level" and the most prestigious of occupational programs. Much of higher education, including the community college movement, is strongly influenced by the reactionary and conservative elements of American thought.* Junior colleges would tend to be more comprehensive and innovative if the liberal and radical elements gain an influence in

*See Rauh's findings on the characteristics of the college trustee (62).

the governance of the institution. Indications have been that very little true experimentation is going on in the community colleges (32:17-20). Some attempts are being made in this direction (33:6-9), but it appears that very little of it is of a more radical nature.

It should be noted that the literature shows common agreement as to the accepted purposes of the community-junior college (1:89, 18:vi-vii, 34:8-9) but the extent to which these goals are actually met is found to vary from college to college, with many of them falling far short of their proclaimed goals.

In order to be comprehensive, a community college should have programs that are of sufficient diversity in terms of:

a. academic level of the programs

b. types of curriculums

The availability of a program at more than a single academic level provides an opportunity for youngsters at different academic abilities to pursue a course in a given curricular area. An example of the multi-level occupational program concept is one developed by Gillie (35:15-16). But multi-level programs are economically feasible only when the two-year college is serving a relatively large population. Many of the existing and future junior colleges are in relatively non-urban areas and their potential student enrollment is small. Therefore, many of these two-year institutions are severely limited in their ability to offer occupational programs at more than one academic level. Adding to the dilemma is the known tendency for the small emerging junior colleges to offer the higher academic level occupational programs rather than the lower ones for the purpose of establishing a good "image." The second aspect of institutional comprehensiveness, diversity in the type of curriculums offered, also is limited by potential student enrollment. Much study is needed to find more adequate solutions to this problem of a small institution not being able to become comprehensive. This suggestion has manifold implications for such things as consortiums for certain occupational programs with residential facilities for students originating from the more distant colleges.

The curricula of the New York two-year colleges illustrate the great differences that can exist between institutions. That state listed 65 junior colleges (36:48-54). One of the colleges, The State University of New York Agricultural and Technical College at Farmingdale, had 26 occupational curriculums listed (in 1964), with a total 1966 enrollment of 8317 (19:43). At the other end of this continuum, there are 15 junior colleges in New York that do not offer any occupational programs (19:40-42) (36:48-54). The 65 two-year colleges offer a total of over 400 occupational programs. This renders an average of about six occupational programs per institution.

The comprehensive community college idea, which is rooted in the belief that educational opportunities should be equalized for all Americans, is not being fully implemented in many places. Martorana pointed this out very clearly when he said (34:9):

> Despite the fact that there is in general little argument about the five broad educational functions which community colleges should get done, there is considerable doubt among community college leaders that the established tasks are in fact being accomplished ... the record of achievement is spotty and disbalanced.

Many of the obstacles to the successful development of truly comprehensive community colleges relate to several major factors, including the following:

1. Many members of the faculty and administration of community colleges have only a partial appreciation of the institution, its goals, characteristics, and programs. This drastically affects the effectiveness with which services are provided by the college.

2. The public has only a vague and sometimes erroneous understanding and appreciation of the community college as a meaningful and viable institution.

3. Major decisions that affect the community colleges are being made by legislators, university faculties, state boards of education, and state departments of education. The tragedy here is that so many of them are uninformed on matters dealing with the community college. All too often there is little or no consultation with community college education specialists.

Considering the difficulties relating to socio-political factors, financing, faculty and administration limited appreciation of the institution, an uninformed public, and an uninformed group of people making major decisions relating to junior colleges, it would appear that the community college as a comprehensive institution will remain more a myth than fact with many of the two-year colleges.

THE OPEN-DOOR COMMUNITY COLLEGE

The expression "open-door community college" relates to admission and implies that any post-high school age person may enroll in the institution. The open door concept has been interpreted in a number of ways, and is probably the greatest dilemma of the public

two-year college. The smaller community colleges, particularly those with enrollments of under 1000 students, find it especially difficult to offer sufficient diversity in their programs to be truly open-door colleges. Debates on the open-door question among community college educators have been going on for years, and will likely continue into the decades ahead.

The origin of the open-door community colleges as an ideal was a natural outcome of the increasingly popular belief in equal opportunities for higher education for all Americans. It was found by Clark (28) that public two-year colleges have a substantial portion of their students that originate from the lower socio-economic groups in their region. Medsker (18:22) pointed out that the junior colleges' relatively great involvement with remedial work is probably related to this same fact - that a large segment of the student population originates from the lower socio-economic groups and are in the greatest need for remedial work in the academic areas. Willis (36:26) and Koos (37:525-531) have reported findings which indicate that college attendance in an area is directly related to the availability and proximity of a low cost public college. There are indications that many of the students enrolled in the community colleges would not have gone to post-secondary education if there were no local public two-year college near their homes. It seems that the establishment of a community college within an area creates a desire to go on to college on the part of many youngsters living in that area. In an attempt to meet the greatly diversified needs found in the students, those junior colleges that try to become open-door institutions seek to develop courses, programs, and activities to suit the needs of their diverse student body. This attempt has created instructional problems of various kinds. Bossone (38:279-283) indicates the need to understand these kinds of students as a prerequisite to helping them meet their goals. Other educators react strongly against the uninspired and unmotivated students that appear on the scene in the open-door college (39:37-39). Another force acting upon the community colleges in terms of the open-door question is the great need for highly skilled and semi-professional workers. Typical of this need is that expressed by U. S. Department of Labor for Technicians (40:30-31).

As the onrush of incoming students continues to build up, many questions have been raised by some educators that relate to the open-door admission policy. It is to be suspected that many educators have answered the questions for their own colleges in terms of their own socio-political belief system.

Some of the more common questions being asked and discussed are:

1. Should every post-high school age person be admitted?

2. Should high school graduation (or its equivalent) be an entrance requirement?

3. Is it possible to develop good curriculums for all post-high school age youth?

4. What should be done for the applicant who appears to be distined for failure in the college?

5. How can public funds for junior colleges be best used?

6. Should the programs for higher academic level occupations be the first to be offered by a college, if a choice has to be made?

7. Should programs for all lower academic level occupations be offered by the community college?

8. Should all programs offered by the college be academic in nature and quality?

9. What is the place of cooperative work programs?

10. Shall the junior college also serve as the area vocational school?

11. Shall the junior college seriously attempt to work with disadvantaged groups?

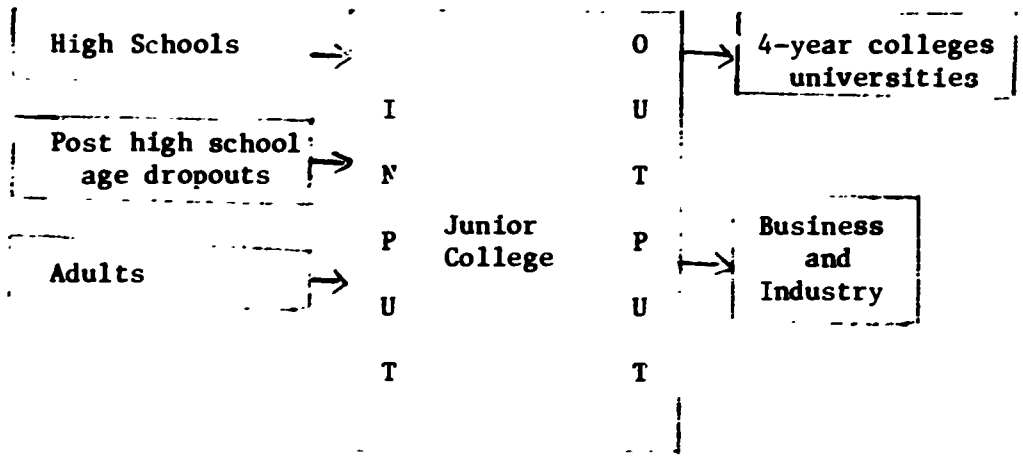
12. Should certain junior colleges have residential facilities for special purpose programs?

13. Should the junior college education of certain youth be completely subsidized - including food, room, clothing, and health expenses?

The preceding queries indicate only a few of the very difficult problems that arise because of the open-door admission policy. One might be inclined (as some junior college educators are), to fall back upon the use of more selective and traditional entrance requirements. In this way they avoid grappling with many of these questions. Some of the more far-sighted community college leaders recognize that not solving these problems now will create educational problems of even greater magnitude in the years ahead.

ARTICULATION

The term articulation is used here in the context of jointing or coupling the junior college with people and other institutions. Using this as a basis, it is seen that articulation can be examined in terms of the college input and the college output, as depicted in Fig. 1.2.



Junior College Articulation: Block Diagram

Fig. 1.2

It is more realistic to examine junior college articulation in a larger context rather than simply looking at the problems associated with the high school to junior college transition and the junior college to four-year college transfer. The majority of the entering community college students do not graduate, let alone go on to four-year colleges. Therefore, the manner in which the institution relates itself to the business and industrial community is perhaps more important a function than the transfer aspects of output articulation. Much real in-depth research and study is needed to determine the most satisfactory ways of articulating with business and industry. Eells (11:60-62) in 1940 found that only 25 per cent of a group of students entering junior colleges in 1937 actually continued their education beyond the sophomore year. A 1952 study by Medsker (18:90-96) found that only one in every three entering community college students actually transferred to a four-year institution. Turning to the occupational program student, Venn (16:88) states that about 171,000 students were enrolled in such curricula in 1960. Brunner (41:24, 32) indicated that 33,148 students graduated from occupational curriculums in 1960. This would indicate that the rate of dropout is probably just as high in the occupational programs as it is in the transfer curriculums. (Dropout is used here to mean a student who failed to complete the program). In the figures just given, the number of occupational program graduates is only equal to about 19 per cent of the total enrollment in occupational programs. Therefore, it is seen that the greatest amount of output articulation goes on between the junior college dropouts and the business-industrial community. A limited number of studies, most quite limited to one community or institution, have been conducted for the purpose of determining the reasons students drop out of community colleges (42: Vol. 2, No. 2). Even fewer studies have

been carried out in which the problem of articulation between the dropout student and the business industrial community has been investigated. There are some indications that some of the dropouts may seek and find employment in the same field of interest as the curriculum from which they dropped out, but in a lower level job (40:27).

Articulation Input:

There has been considerable discussion as to how to determine who should be admitted into the community-junior college. Venn (16:158) strongly urged the post-secondary system of education to make greater provisions for occupational education. As this trend catches on, assuming that it will possibly become the major offerings of the junior colleges, the articulation problem between high school students and the junior college become more difficult. Continued attention to learning more about the kinds of students that are going to seek admission will become even more important (43:155-174; 44:14; 45; 46; 47:225-252). Keeping high school educators and students informed of junior college offerings is an ongoing problem. Typical of the efforts in this direction are those taken at Miami-Dade Junior College (48:33-34).

As time goes on and the junior college movement matures, the community colleges may seek to admit more post-secondary age youth that are not high school graduates. Such a challenge goes much beyond simply deciding to accept these students, it entails a strong spirit of experimentation with programs that are not academic in the traditional sense, and may even require radical changes in facilities as well as curriculum planning. This aspect of input articulation is, for the most part, virgin ground yet to be explored. It is another aspect of public education which demands attention because of the increased importance being placed upon education. If the community colleges fail to assume responsibility in this, it is of such importance that other institutions designed to handle this problem will be developed.

The third group involved with input articulation is comprised of adults (i.e. beyond the traditional college age group). It appears that much change is going to take place in the way the two-year colleges can serve this group. As American technology continues to accelerate the rate at which jobs disappear, the time is just about here when many adults will need to leave the world of work for several years and develop competencies in a new occupation. If and when this trend gathers strength, it will be with the full support of society to the extent that the adult will be subsidized during the time he returns to college. In this way, it will be possible for any adult to return to college to be educationally modernized and still not be placed in financial jeopardy. Within the next decade or two, this group (full-time adult students) may be numerically much larger than the group of younger students.

Articulation Output:

The transfer of junior college graduates into the four-year colleges and universities has met with varying degrees of difficulty throughout the country. The two-year colleges are concerned about their graduates obtaining full credit for their first two years of work. The four-year colleges, on the other hand, attempt to insure themselves that they are accepting transfer students who are academically comparable with their students who completed the first two years at the four-year college. The controversy continues, and as long as various institutions have some degree of autonomy, it will probably go on for some time.

Some attempts to smooth the transfer function have been made by several states, and also on a national scale. Florida has made a statewide effort to smooth out their transfer problems (49:50-52):

> Florida's Plan for Community Junior Colleges published in 1957 called for a liaison committee on articulation consisting of representatives from the university system, the junior colleges, and the State Board of Education ... The committee ... is specifically authorized to do the following: Identify problems of articulation and programs or other phases of operations where secondary schools, junior colleges, and state universities relate ...

California developed a proposal to have an "Automatic Junior College Credit Plan." Controversy developed over the issue. As might be expected, the Junior College people supported the plan while the university and state college representative vigorously opposed it (50:16-19).

One of the most significant efforts to facilitate articulation between the two-year and four-year colleges is the activities of The Joint Committee on Junior and Senior Colleges. Nelson has reported on the outcomes of this committee's actions (51:72-73; 52:24-26). The Joint Committee members were drawn from the American Association of Collegiate Registrars and Admissions Officers, the American Association of Junior Colleges, and the Association of American Colleges. This committee suggested that a study of the transfer student be conducted. The study was later conducted by Knoell and Medsker (53, 54). In 1964, the Esso Education Foundation supported a national articulation project, which was administered by the American Association of Junior Colleges. The results of the Knoell and Medsker study prompted the origination of this joint committee project, which involved ten states (California, Florida, Georgia, Illinois, Kansas, Michigan, New York, Pennsylvania, Texas, and Washington). From the state conferences, the group developed a guidelines statement dealing with: a) admissions; b) evaluation of transfer courses; c) curriculum planning; d) advising, counseling,

and other student personnel services; and e) articulation problems. The results of this effort, as stated by Nelson (52:26):

> The guidelines proposed by the joint committee on junior and senior colleges do not represent a panacea. However, applied in a context of mutual respect and cooperation, they may constitute a constructive force for the improvement of articulation.

Recall, from Fig. 1.2, that the second aspect of output articulation deals with the non-transfer student, i.e. the occupational program graduate and the student dropouts. Articulation for these individuals is performed, when it is available, by the placement office which usually is within the framework of student personnel services. It is ironic that some junior colleges devote so little of their output articulation effort in this direction, while this is the service needed by the majority of the students. The placement function should be a full-scale, well financed operation in which close relationships are established between the college and the business-industrial community. The ideal placement activity would have a built-in follow-up aspect to the endeavor - which can be an invaluable source of information for the evaluation of the placement effort itself and also useful (if the proper information is sought) for the evaluation of the occupational curriculums. The placement officer should be also responsible for placement of those students who left the college in previous years (either as dropouts or graduates) and return to seek assistance in finding new jobs. Another important duty of this office could be the role of obtaining part-time work for students who are in need of a job.

The placement activities of the two-year college is another area that needs much more in the way of research-type investigation. Studies focused such that they attempt to identify the characteristics of successful output articulation of the non-transfer student (occupational program graduates and all dropouts) are not in evidence in the literature at this time. It seems logical to hope that the outcomes of such studies would serve as the basis for establishing the excellent job-placement service so sorely needed for these youth.

URBANIZATION AND THE COMMUNITY COLLEGE

Bebout (55:48), in describing some of the problems that have come about as a result of urbanization, said:

> Considering the fact that the transition from rural to urban has occurred during the lifetime of most of the adults now

> living, and considering its galloping pace, it is no wonder that there has been a decided lag in intellectual, emotional and institutional adjustment to the altered nature of the American scene.

The trend toward urbanization had developed along certain detectable characteristics; some of the more significant ones are:

1. Inner city populations have remained relatively static while the areas surrounding the cities (suburbs) have experienced the greatest population increases.

2. Inner city populations have become more heavily composed of Negroes and other minority groups of low socio-economic level.

3. Urban settlements have developed in strips; some of the larger ones are: a) Portland, Maine to Norfold, Virginia; b) along the Great Lakes; c) the Gulf Coast from Texas to Florida; d) San Diego - San Francisco.

This trend toward increased urbanization is also changing the role of the government in our society (55:55):

> ...It does mean that in the matter of physical facilities and of programs affecting the physical environment, urban America must more and more expect to be served and governed by a collaborative effort of National, State and local governments.

This statement is amplified by the frequent pleas from the city mayors for additional state and federal funds to apply toward the solution of sundry city problems and needs. Recently the federal government has begun to respond to these requests in the form of the Civil Rights Act, The Economic Opportunities Act, The Model Cities Program, and in other bills relating to education. Hopefully, the federal and state governments will begin to provide more nearly adequate financial assistance to bolster city funds so that some progress will begin toward attacking the kaleidoscopic problems of the great urban centers.

Administrators of urban community colleges have the task of seeing to it that the Board of Trustees, faculty and administration understand the characteristics of the population to be served by the two-year college. Cosand (56:64) suggests that the two-year college should become the center of hope for the youth and the adults of the urban community - a place where they can raise both their occupational and cultural levels. The urban college must have curriculums in which the students can see progress in terms of self-betterment and development of self-potential.

Some urban areas, probably because of the philosophic makeup of the trustees and college administrators, have selected permanent

community college campus sites out of the inner city and away in a middle class suburban community beyond the city fringes. This is viewed by some as the tendency for many two-year colleges to skirt the real urban educational problems to which they should address themselves. By the same token, it may be more desirable to locate away from the heart of the ghetto area but erect a handsome well planned facility in the center of the city's commercial activity. Such a location, often not far from the ghetto district, would more likely be at the very hub of public transportation facilities, part time occupational opportunities, and sundry cultural activities. Because of the home environment characteristics of many urban youth, the city community college should have an extensive and highly functional student center which would include library, recreation, eating, and study facilities. An intelligently planned student center will do much to help create a desire on the part of the students to remain on campus for longer periods of time each day - thereby increasing the chances of their establishing peer group relationships and developing a feeling of being part of the college. These factors are crucial in student development and increase the probability that the student will remain in college.

Staffing the urban community college, such that it will truly be cognizant of the problems of the population that it is to serve, is one of the most difficult tasks for the administrator. The president will have to look far and wide for competent faculty who are committed to this kind of education. It will have to be a faculty which must find new ways for the presentation of relevant material, development of new programs, and the building of new courses.

Because the attitudes of people tend to change as they are continuously exposed to a given environment, there should be an ongoing assessment of faculty attitudes toward the city, students and programs. Cosand succinctly put it this way (56:71):

> ...this change of attitude is a rather insidious thing, and many times has gone much further than was realized. In general, the change in attitude is a growing antagonism towards the technical and remedial student, and a desire to teach only those classes where students have been screened for enrollment in the more difficult subject offerings.

Progress is being made in some quarters with the development of meaningful programs for urban community colleges. For example, a program to prepare Urban Professional Assistants has been established in Maryland (57:20-21). The State University of New York has established urban centers where less-than degree programs are offered to disadvantaged students (58:9-11). Knoell

said the following about this activity:

> The urban community colleges in New York State are being given an exciting opportunity to serve disadvantaged youth and others in need of further education in newly established urban centers... The general goal is to provide new opportunities for those now beyond the reaches of the colleges. It is encumbent upon the colleges to develop fully the opportunity they have been given, or risk the establishment of a new post-secondary institution which will in time be competitive for students, staff, facilities, and funds. The colleges have accepted the challenge. A start has been made (58:11).

It is interesting to note that the State University of New York apparently felt it was necessary to step in and start these centers for disadvantaged youth, which apparently indicates the junior colleges were not addressing themselves to this problem in a serious manner. Another curious fact is that these centers are away from the college campus. One is tempted to ask "why?" The urban community college that is doing something about the educational problems of its city can become the most viable two-year college institution of all. It is time that this breed of junior college appears upon the American scene in strength. The future will show the extent to which such junior colleges will blossom into their full potential--becoming the centers of hope for the urban poor.

THE ROLE OF THE JUNIOR COLLEGE IN HIGHER EDUCATION DURING THE LAST THIRD OF THE 20TH CENTURY

One of the major roles expected of the nation's two-year colleges in the years ahead is to provide a vehicle by which youth can achieve occupational success. To expect the community junior colleges to serve this great purpose appears to be realistic in the light of recent findings relating to the occupational structure in American Society. Blau and Duncan (59:403) found that of the four major determinants of occupational achievements, education exerts the strongest direct effect. Therefore, by increasing the universality of higher education, the two-year colleges become a means for youth to move toward greater occupational achievement.

Fiesman and Jencks, in considering the impact of the junior college upon American higher education, said (60:85):

> ... the junior college may become, in its academic temper and its conciliation of local "needs" and powers, a near automatic upward extension of high school to the 13th and 14th grades...

This would indicate a belief that the community college will be a major institution in the popularization of higher education. If this is the case, it is hoped that junior college faculty and administrators will become more knowledgeable in matters that deal with personality development. Sanford (61:267) made the following comment relative to this important point:

> A truly effective community college....may provide commuting students with both intellectual stimulation and social support to help them achieve independence of their parents. Whether or not it does so would seem to depend on such factors as the degree of contrast between the prevailing college values and those of the family, how much of a community and how attractive a community the college succeeds in being, and whether or not it is able to give the student a strong sense of membership within it.

The community college will hopefully continue to attempt to fulfill its desire to be the open-door institution of higher education. With the serious pursuit of this ideal must evolve much more adequate means for helping admissions specialists to match students with programs with a greater assurance of success than is presently being experienced. A great amount of study and research is needed in the area of predicting student probability of success in various programs. Some of the data needed for establishing prediction techniques can be gathered on an empirical basis by many junior colleges over a period of several years. Other aspects of this problem involve research endeavors of greater depth and complexity. The junior colleges must learn how to deal with the so-called "unfit and the incompetent" student and facilitate their development toward fitness and competency. As a public institution the community junior college should reject the conservative and unimaginative beliefs that seem to pervade the atmosphere about not being able to serve all post-high school age youngsters. In the decade ahead, such a notion will become as absurd as denying secondary school opportunities to all youth.

The community college will be the only higher education experience for a large fraction of American youth. The preparation of teachers and administrators for the junior colleges is a critical problem that has received only limited attention. An integral part of educating future community college teachers and administrators is to include studies dealing with junior college administration, curriculum, student personnel problems, college student psychology, junior college teaching methods, and a junior college internship. This is particularly important for those teachers who are drawn from the secondary schools and four-year colleges, as well as for the inexperienced instructor.

Now that the community college movement has left its own period of childhood, it must accept its maturity by meeting the obligations society is imposing upon it - to furnish quality education of great diversity in both academic level and in types of programs. Fifty years from now, the community-junior college will be viewed in one of two ways:

1. The chief instrument in the democratization of American higher education, or

2. As one of several institutions designed for the education and training of people in higher education in our society. If this trend develops, the "trade and technical" junior college will become a competing institution and may even enroll more full-time students than those which will then be called the traditional community junior colleges.

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CHAPTER 2

THE SOCIAL MILIEU AND OCCUPATIONAL EDUCATION

OCCUPATIONAL EDUCATION BEFORE THE TWENTIETH CENTURY

Back in the days when America was made up of several colonies, an individual's career was in great part determined by the status of the family from which he originated. Furthermore, most stable males in those days considered their first vocation as their life's occupation. This is in considerable contrast with present day occupational choice making - in that an individual going into the world of work today can expect at least several job changes before he retires. The present conditions are also different in that the chances of achieving upward social mobility via occupations are considerably better. Havighurst and Neugarten (1:424) emphasized this when they found about one out of eight persons will move up at least one rung on the socio-economic ladder during his lifetime. This upward mobility is in great part the result of the expanding technology. Occupational mobility was virtually nonexistent in the colonial days, because of the fixity of society during that period of our history. Occupational education had no significant role to play in the American colonial era. The apprenticeships were the nearest thing to occupational education during those times but the author choses to not classify them as education but as a form of on-the-job training.

The industrial revolution, which first started in England during the middle of the eighteenth century, was one of the major catalysts in the societal changes that began to take place. The introduction of machines and power as replacements for human physical strength began to create new jobs that required some manipulative skills. Along with the need to know how to operate the machinery, there was a need to have some people with knowledge of the theoretical aspects of the machines and the processes. For the first time, a significant number of vocations were appearing on the industrial scene that required cognitive skills along with manipulative know-how. It can be said that this state of affairs laid the groundwork for a rational for establishing programs in occupational education.

The Europeans were quicker to recognize this fact than were the Americans. Various forms of occupational training programs were inaugurated with public support in Prussia, England, Austria, Switzerland, Italy, France and Russia during the mid-nineteenth century (2:40; 3).

Since American education was dominated by the British education model (emphasis on the classics), occupational education was doomed to a slow start. The aristocratic education model, which seemed to deliberately be non-utilitarian in nature, was the prevailing kind of education in America until the Civil War. There were some stirrings for the establishment of occupational education before the mid-point of the nineteenth century. Some of these were:

1. The American Lyceum Movement in 1826.
   This was an abortive attempt to provide popular adult education via lectures.

2. Rensselaer Polytechnic Institute in 1824:
   it's announced major goal was to apply science to the practical aspects of life.

3. University of Michigan in 1837:
   The charter made provisions for courses in practical farming and agriculture.

4. Lawrence Scientific School of Harvard in 1847.

5. Sheffield School of Yale in 1859.

The above attempts, as a whole, had very little impact on the popularization of occupational education however. Eddy (4:6-22) found that about a dozen of the 397 American colleges in 1860 had departments of science and agriculture. Venn (2:43-44) points to two salient reasons for the very slow growth in American Occupational education during the nineteenth century:

1. Because of this nation's rich soil and favorable climate, better techniques for farming were not in as great a demand as they were in Europe (which already was feeling the pinch of limited natural resources).

2. There was virtually no popular support for occupational education. The practical man did not want to attempt mixing utilitarian ways with the prevailing classical type of education. At the same time, the upper class individuals continued to view education as the mechanism for the preservation and extension of the general culture. Therefore, it is seen that the development of occupational education was effectively blocked by both the common man (for one reason) and the gentleman (for another reason).

The Morrill Act of 1862:

During the mid-nineteenth century there were pleas for the introduction of a type of education that was more utilitarian. In spite of this, occupational education obtained no popular support and the majority of the pre-Civil War occupational educational institutions did not survive.

In 1862, Abraham Lincoln signed the Morrill Act of 1862 into law. The Congress and other leaders of that day apparently were not completely aware of the implications that this act had for education. The Bill was in response to several forces that were influencing congressional thinking at that time, they were:

1. A need to provide the farmers with some kind of favorable legislation.

2. A need to provide a framework within which training could be provided for military officers and engineers.

The Morrill Act provided land grants to the states which were to endow, support, and maintain agricultural and mechanical state colleges. It was to provide the industrial classes with a liberal and industrial education.

The Morrill Act provided the major impetus for the development of thirty institutions of higher education - which in turn became the centers of learning, training, and research in agriculture and mechanical arts. The inauguration of this legislation imposed a new force into the mainstream of American education, which resulted in a significant change in its overall direction. This shift in the direction of American education had several implications for occupational education (2:45):

1. Liberal and practical education were to be integrated.

2. Higher education, by providing this new kind of education, opened its doors to a larger segment of the public.

3. Agriculture and mechanic arts were given important status.

4. The new kind of education gradually became more (although not completely so) acceptable to the public at large.

5. The social efficiency of occupational education, as shown by how the agriculture colleges improved farming, was proven to the public over a period of several decades following the passing of the Morrill Act.

The American High School:

It is a curious paradox to note that occupational education was not introduced to the secondary schools until a considerable time after it had already found its way into higher education. But in the nineteenth century, the college student body consisted by and large of teenagers, and they were at the age for learning the middle-level skills needed at that time. It is interesting to note that the nineteenth century college was functioning not unlike the twentieth century comprehensive secondary schools in terms of student age, course content, and academic level of instruction. Furthermore, the primary purpose of the nineteenth century high school was to serve as a feeder institution to the colleges. Since it served as the institution that prepared grammar school graduates for college, it had no place for terminal occupational education. This point is emphasized by pointing out that eighty per cent of the 1870 high school graduates went on to higher education and sixty per cent of the same group went on to receive college degrees. This implies that certain youngsters (the great majority) were effectively screened out of the high schools during that period of our history (i.e. only the college bound younsters were accepted by the secondary schools).

High school enrollment and graduation began to soar from 1880 on. Curiously, the percentage of these graduates that went on to and graduated from college decreased, as shown in Table 2-1. The fact that a smaller percentage of high school graduates transferred to colleges forced the secondary schools to examine themselves in terms of what needed to be done educationally for the terminal high school graduate.

Year	% of high school graduates that earned a college degree
1870	60
1900	25
1920	20
1940	15

Table 2-1

The popularization of the secondary school provided the college with a larger pool of youngsters whom they could select from, which enabled the colleges to raise their admission requirements, and also to advance their level of academic work. One result of this trend was the development of a vacuum in the preparation of people to be employed in the middle-level occupations.

The secondary schools, because of the traditional college preparation orientation of both teachers and administrators, resisted the societal demands that they meet the problem of preparing youth for middle-level occupations. As it became more and more evident that the high school was a terminal institution for the majority of its students, the public demands for occupational programs increased. These demands went unheard for many years. High school attendance was still low in those days, only 7 per cent of the youngsters in the 14-17 age group were in high school in the 1890's.

One reaction against traditional secondary education by certain individuals lead to the development of the manual training movement. The first manual training school was opened in 1880 in St. Louis. Some of the most significant aspects of the manual training movement included:

1. It was an attempt to invigorate the traditional curriculum and was not considered to be occupational education.

2. It introduced shop instruction, i.e. the construction of shops in the schools was introduced for the first time in America.

3. It provided the opening wedge for the eventual entry of occupational training into the secondary schools.

Beginning in the 1890's, occupational programs increased to the hundreds - they included metalwork, home economics, trade programs of many kinds, and several forms of business education. This resulted in many educators dividing themselves into two polar positions on the relationship of occupational education to secondary education.

1. The position of the pro-occupational education faction was: They demanded a new kind of education that would meet the demands of the new industrial age.

2. The position of the pro-traditionalists was: They defended the traditional curriculum as the only way to save general education.

John Dewey was one of the leaders among those who saw the dangers inherent with the concept of separitism in public education (5:499-541). He publically urged that occupational education be drawn into the overall school program in that it would be of greatest benefit to all. But history shows that uncompromising positions were taken by many important people in both camps (the occupational educators said the traditionalists were diluting their programs, while the traditionalists insisted on an academic curriculum for all students and the same kind of preparation for all teachers). At this juncture, because both factions hardened their stands, some talk was heard about establishing separate public vocational high schools.

It is interesting to note that industrial management endorsed the idea of occupational education, since it would provide them with a source of manpower and would also reduce the need for apprenticeships (6:35-36). The unions, on the other hand, were not particularly in favor of occupational education, as they saw it as a threat to their recently hard-earned gains over management (6:35-38). Perhaps one of the most significant characteristics of the 1890's was the great amount of debate that developed over the question of occupational education and its role in the system of American education. It might be said that the debate still goes on in some places.

In our own decade, a considerable amount of debate is going on among the newly emerging area vocational schools and the community colleges. Some authorities in these two kinds of institutions see them as competitors for the same public funds. Much of this problem has been created by divergence of opinion as to the role of occupational education in American education. There is a sizable group of vocational educators, if one can guess from actual developments, that is strongly pushing for separate institutions for occupational education. One may surmise that individuals who support the philosophy of separitism are those behind the area vocational school movement. The community college group, who as a whole haven't done too well with occupational education, want to keep the post-secondary occupational education within their framework. While the debate rages, both area vocational schools and community colleges are being rapidly developed.

OCCUPATIONAL EDUCATION BETWEEN 1900 AND 1940

The first decade of the twentieth century was one of great national growth, as evidenced by the following:

a. The population increased from 76 to 92 million.
b. Farm income greatly increased.

c. The gross national product doubled.
d. Industrial production rose sharply.

During 1900 to 1910, the demand for skilled manpower became critical. This increased need came about as a result of several factors. After 1900, the majority of the immigrants (who came from Eastern Europe, Italy and Russia), did not possess the skills that the earlier northern Europeans had. The second factor that contributed toward the shortage of skilled manpower was the very rapid rate at which industrial production was expanding. Because of the critical need for skilled manpower, societal pressures forced the schools to seriously consider doing something about occupational training.

The National Society for the Promotion of Industrial Education was organized in 1906 under the leadership of Charles R. Richards of Columbia University and James P. Haney, Director of the Manual Training Program of the New York City Public Schools. The major objective of the organization was to unify those forces that were in favor of occupational education. By 1910, many influential groups were lending their support toward establishing occupational education programs in the schools.

These groups included the National Association of Manufacturers, the American Federation of Labor, the National Education Association, the National Grange, and the Association of Agricultural Colleges and Experiment Stations. The National Society for the Promotion of Industrial Education was composed of people from business, labor, as well as municipal reformers, settlement workers, and progressive educators. There was a strong demand from this group to inaugurate experimentation and reform in education.

Massachusetts, on the basis of the Douglas Commission (7), adopted the idea of a dual school system - a vocational school system alongside the traditional school system. This heralded a movement which led to more than twenty states establishing separate state-wide programs in occupational education by 1910. John Dewey and many other prominent educators argued against the duality idea during this period, but it still took hold in many states.

During this time, The National Society for the Promotion of Industrial Education decided to pursue the objective of obtaining substantial federal funds for occupational education. By establishing a coalition with rural interests in the congress, the National Society succeeded in getting a joint resolution of

congress in 1914 which created a Commission on National Aid to Vocational Education. The report of this Commission (8) has been called the Magna Carta of American vocational education (2:57) by some.

The report of the National Commission on National Aid to Vocational Education was sent to Congress in 1915, but was not acted on immediately. In 1917, when the nation was very concerned about training war workers, the Vocational Education Act of 1917 (known as the Smith-Hughes Act) was enacted. The law created a Federal Board for Vocational Educators. The initial appropriation was seven million dollars. Because of the way the bill was written, and the fact that it offered categorical aid, it resulted in a very strong federal influence on the programs. The Smith-Hughes Act was the first occupational education act for secondary schools. It provided federal funds for programs in agriculture, home economics, trades, industry, and teacher training.

The Smith-Hughes Act continues in effect to this day. Several other legislative enactments prior to 1940 have added an additional amount of funds to the effort. Some of the other acts are (9:34-45):

1929: George-Reed Act. This bill expanded occupational education in agriculture and home economics.

1932: Federal Occupational Education Programs were extended to Puerto Rico.

1934: George-Ellzey Act. This was the replacement for the George-Reed Act, which had expired.

1936: George-Deen Act. It added distributive occupations to the occupational educational authorizations.

It is interesting to note that the organization which was the prime mover for obtaining federal support for occupational education changed its name in 1918 from the National Society for the Promotion of Industrial Education to the National Society for Vocational Education. Then, in 1926, it merged with the Vocational Education Association of the Middle West and became the American Vocational Association. This is the only leading professional organization in the field of occupational education.

Looking over the first forty years of the twentieth century, it is seen that the great need for occupational training forced American education to at least partially accept vocational education

because of the phenomenal industrial growth during the early part of the twentieth century. It should be noted that the need for providing occupational training could have been met in a number of ways, which failed to do so for one reason or another. Some of these alternate possibilities that failed to materialize were:

1. The father-son method. This was common during the colonial period. It was later considered to be not democratic and a very inefficient method of training. Therefore it fell out of vogue.

2. Apprenticeships. This demanded docility of youth, which ran counter to the democratic movement. Furthermore, the apprenticeship principle became the focal point of several major labor-management disputes. It has not been a significant training method for decades in most sections of the United States.

3. Industrial Training. Industry was not particularly anxious to initiate and maintain their own training programs. Furthermore, the public did not wish to entrust the job of youth training to the industrialists.

4. The Labor Unions. Because of their great concern with striving for political strength and recognition, the unions did not seriously consider getting involved with occupational education.

5. Religious, civic, and philanthropic institutions. There was insufficient organization and inadequate funding for these institutions to ever develop programs in occupational education to the extent that they were needed.

Because none of the above possibilities rose to the task of providing occupational training, it seemed natural that the public would turn to its system of education to do the job. Ironically, the educational community rejected occupational education as a legitimate kind of education for a long time. At the same time, because of the great demands for occupational training from certain segments of our society, occupational education was forced into the rubric of the educational community.

Perhaps because of its failure to obtain succor and status from the public in general, and the educational community specifically, the structure of occupational education was essentially the same in 1940 as it was in 1917 (in the opinion of this writer).

Furthermore, this archaic and highly inappropriate structure was widespread until 1963 and is still found in many states. The Smith-Hughes Act was the chief perpetuating force behind the maintenance of the status quo. The philosophy behind the Act embraced a system of values and beliefs that harked back to the days before World War I, and should have been rejected by the occupational education community shortly after that conflict. In as much as the Smith-Hughes Act had such a stagnating effect on occupational education, it is worthwhile to examine some of the features of the philosophy behind it. The nine most significant points within that philosophy are (2:64-66):

1. Uniformity. The act prescribed the courses and how they were to be taught.

2. Duality. The act strongly encouraged separate administration of the occupational programs.

3. Secondary school. The act specifically limited the funds for "less than college grade" programs.

4. Practical. The programs had to schedule large blocks of time for job practice.

5. Terminal. The programs were designed to prepare youth for employment and made them woefully unprepared for study beyond high school.

6. Track. Youth selecting the occupational programs after the ninth grade were just about surrendering all chances of going on to college.

7. Farm-craft. Over sixty percent of the funds were earmarked for agriculture and home economics.

8. Shop. The act mandated that there be shops in the schools. In later years, when technology moved faster, this effectively assured built-in obsolescence in many vocational schools.

9. Vocation. The act implied that the student was being prepared for a life long occupation, which became increasingly more invalid as the twentieth century progressed.

Although some occupational educators will take issue with this statement, this author believes the renaissance of occupational education can be said to have started in 1963. It has hardly begun and many great things lie ahead. The following section treats this point in some detail.

OCCUPATIONAL EDUCATION SINCE 1940

Occupational education obtained generous support during World War II - again because the public strongly felt that the development of certain skills was essential to the war effort. Seven million war production workers were given pre-employment and supplementary training in the Vocational Education for National Defense Program. This was in effect between 1940 and 1945. In 1946, the George-Barden Act ($29 million) was enacted into law, and was the replacement for the older $14 million George-Dean Act. The George-Barden Act funds were allocated to agriculture ($10 million), home economics ($8 million), trades and industry ($8 million), and distributive occupations ($2.5 million).

During the decade 1945-1955, a considerable amount of funds found their way into various occupational programs throughout the country via the G. I. Bill.

A controversy over the desirability of allowing federal aid to education broke out in full bloom during the fifty's. Since occupational education was already a recipient of federal funds, it naturally became embroiled in the controversy. Despite the barrage of anti-federal aid to education talk, the existing occupational education programs did not suffer any significant decreases in governmental support. Furthermore, the George-Barden Act was even expanded to include practical nursing and fishery trades in 1956.

The 1958 National Defense Act contained a title VIII, which made funds available"...for the training of individuals designed to fit them for useful employment as highly skilled technicians in recognized occupations requiring scientific knowledge...in fields necessary for the national defense." (2:61-62). This act was able to give support to area occupational programs of less than college grade.

In 1961, section 16 of the Area Redevelopment Act provided $4.5 million for occupational training of individuals in the designated areas of persistent unemployment and under-employment. The Manpower Development and Training Act of 1962 had provisions for training the unemployed and also for upgrading those individuals whose skills were becoming outdated because of the changing occupational needs of society.

A special Presidential Panel of consultants was appointed in 1961, and they conducted a year-long study on the national needs of occupational education. Based on the recommendations of this

group, the Vocational Education Act of 1963 was passed by the Congress. The most significant feature of the Vocational Act of 1963 was that it granted authority for an entirely new occupational education program that was completely free of the restrictions of the older legislation. Because it provides for a new form of occupational education, this act can become the rallying point for the much needed modernization of occupational education. The Vocational Amendments of 1968 are a continuation of the 1963 act with modifications based on the recommendations of an advisory group.

Some of the older institutions and occupational educators, because of being accustomed to the earlier structures of occupational education as imposed by the Smith-Hughes and George-Barden Acts, will find reasons of their own to oppose the move toward developing a more viable relationship between education and the world of work. The emerging community colleges, being relatively free of established traditions and proponents of the old ways, might become the leading instruments in the modernization of occupational education in the years ahead. Unfortunately, some of the leadership in the junior college movement is not truly sympathetic toward occupational education or particularly knowledgeable as to its integral place in the community college curriculum. Time will tell just how workable an institution the community college will become in this regard. A number of educational leaders point to the fact that occupational education must become a major thrust of the junior college if it is to become a truly viable institution (2:165, 10:36).

THE NEW TECHNOLOGY: IMPLICATIONS

The new technology, a term used here to describe the great social and economic changes going on about us, promises to produce even greater changes at faster rates in the future. Some theorist feel that a revolution comparable to the industrial revolution of two hundred years ago is upon us. Venn, in relating the new technology to education said (2:1):

> ...technology has created a new relationship between man, his education, and his work, in which education is placed squarely between man and his work...modern technology had advanced to the point where the relationship may now be said to exist for all men and for all work. Yet, though technology today in effect dictates the role that education must play in preparing man for work, no level of American education has fully recognized this fact of life.

What are some of the most significant vehicles in this changing society? Automation and computers rank at the top of the list. Automation encompasses a large family of devices and systems that automatically function as sensing instruments, and also perform the motor tasks associated with the job. Obviously, automation has supplanted a considerable amount of human labor and promises to displace even more of it in the years ahead. Computers are electronics systems which can perform tasks done by humans that involve some of the functions that were once considered to demand human thought. Some of these functions include memory, analysis, logic, and even decision making. An examination of job statistics shows that where automation and/or computers have been introduced, the number of jobs have suffered a decrease.

The new technology has resulted in a reduction in the number of blue collar workers needed and an increase in the demand for white collar workers with cognitive skills. Along with this trend comes a vital need for a new kind of general education for youth that will better prepare them for the changes that lie in store for them - changes in job, geographic location, and living style. The shift in occupations that has been going on during the post-World War II decades in particular is due to the new technology. The following section studies this aspect of the problem.

The emerging new technology has progressively increased the difficulty in which youth can find opportunities for employment. It has been found that 30 per cent of the high school dropouts will be jobless and 15 per cent of the high school graduates will

be in the same category at any given time. The President's Committee on Youth Employment (11) warned of the serious consequences of joblessness among youth in terms of delinquency, crime, frustration, resentment and defeat.

The relationship between amount of formal education and type of occupation held by an individual points to the value assigned to education by the industrial and business community (2:15-16). Many educators contend that occupational education can have sufficient diversity and practicality to educate all youth to their full potential. This writer believes that there are strong indications that the present forms of occupational education are probably not able to meet the demands of the new changing world of work. It is reasonable to assume that most sub-professionals can expect to undergo at least six occupational changes during the first forty years of their working life. Therefore, as pointed out in the preceding chapter, a pattern of continuing education on a full-time basis from time to time, must be established very soon. In this way, when an individual is to make an occupational shift, he can return to school (i.e. the junior college) on a full time basis with a stipend equal to his average income earned at his last job. Society should invest that amount of money in people in order to bring them back up to their maximum occupational productivity. Also, general education must learn how to prepare people for happy use of leisure time, true desire for civic participation, and psychologically prepare them for all aspects of occupational and geographic mobility. All of this is a monumental job for American education, which hasn't developed too impressive a record with the more simple tasks assigned to it in the past.

OCCUPATIONAL TRENDS AND IMPLICATIONS

Fields (12:127) drew up five occupational trends that are of great significance for community-junior college educators in particular. These five trends are:

1. Large differences can be seen between those occupations that are increasing and those that are decreasing. Table 2.1 points this out. The greatest increases as a percentage of the total labor force are found in the white-collar categories, where higher levels of education are required.

Table 2.1 (2:8)

Major Occupational Groups as a Percentage of the Total Labor Force: 1960 and 1975 (projected).

			difference
White-collar workers	43.1	47.8	+ 4.7%
Professional and Technical	11.2	14.2	+ 3.0%
Managers and Proprietors	10.6	10.7	+ 0.1%
Clerical Workers	14.7	16.2	+ 1.5%
Sales Personnel	6.6	6.7	+ 0.1%
Blue-collar workers	36.3	33.4	- 2.9%
Craftsmen and Foremen	12.8	12.8	0.0%
Semiskilled Operatives	18.0	16.3	- 1.7%
Laborers (exclusive of farm and mine)	5.5	4.4	- 1.2%
Service Workers	12.5	14.3	+ 1.8%
Farm Workers	8.1	4.5	- 3.6%

2. The occupations that require above average educational preparation are going to increase in number, whereas the occupations that require little or no educational preparation will decrease in number. This trend is shown by the figures in Table 2.2.

Table 2.2 (2:18)

Percentage Change in Employment by Major Occupational Groups: 1960 - 1975.

Occupational Group	Percentage Increase 1960 to 1975
Professional and Technical	65
Managers and Proprietors	32
Clerical Workers	45
Service Workers	51
Sales Workers	34
Skilled Workers	30
Semiskilled Operatives	18
Laborers (exclusive of farm and mine)	00
Farm Workers	-28

3. Occupations that require college (i.e. post-secondary) preparation will have more openings than the number of available people with such training. This is implied from Table 2.2, which points to large increases in those occupations that require post-secondary preparation.

4. Certain groups of people, i.e. those that are relatively uneducated and unskilled, will always be threatened by the possibility of unemployment or underemployment. The predicted decreases in the proportionate number of blue-collar workers needed in 1975 points to this fact. This is further reinforced by the Figures in Table 2.2, where the percentage increase in semiskilled workers is near the bottom of the list, along with laborers (with no expected increase) and form workers (with a predicted decrease of 28 per cent).

5. The impact of our changing technology with reference to the explosion of knowledge and other aspects of automation is going to increase. This trend will require us to learn how to live in ways that are entirely different from our present living styles.

The Implications:

Because of the increase in the demand for higher education, as imposed by the need for further education to qualify for the many emerging occupations, it is logical to assume that the comprehensive community college will serve many of these people. This is our first implication: If the community colleges are to become truly viable institutions in the new society that is just before us, they must learn to accept all occupational programs at the same level of prestige as the traditional liberal arts and pre-professional programs.

It is safe to assume that community colleges, contrary to the desires of a large proportion of their faculty members, will not truly compete with the four-year colleges and universities in the areas of liberal arts and pre-professional courses. If the community colleges persist in focusing on this aspect of collegiate education, they are doomed to become weak sisters to the four-year colleges and universities. The real strength of the junior colleges of the future lies in their ability to become truly comprehensive institutions. One major weak area in this attempt is the severe scarcity of administrators with strong backgrounds and appreciations in occupational education who also have the ability to lead community college faculties (12:131).

Our third implication relates to obtaining instructional staff. Occupational educators in the past (and even today in many places) insist on obtaining people with a given number of years of industrial experience in the area in which they are to teach. This requirement was certainly appropriate in the days of World War I and there-abouts, when technological changes were relatively slow. At this point of our technological development, the requirement of years of industrial experience as a prerequisite for teaching in an occupational program tends to encourage the outdated individual to seek sanctuary in the cloistured laboratories and classrooms of the community college. A common example of this fact is the engineer fresh from industry with many years of experience who does not have the new knowledge of his specialty but seeks to teach. Technology is moving with such rapidity that it is highly unlikely that an instructor's actual industrial experience will be modern enough for him to use even a few years after he leaves the industrial scene. Furthermore, many of the jobs held by these persons were narrow in scope and fail to provide him with a truly broad view of his own specialty.

What is the answer to this problem? Obviously, a new way of preparing occupational program instructors is called for - another implication of the fast-changing world of work. It is time that educators should turn to some serious pilot and experimental programs for the preparation of occupational programs teachers. There are several types of teacher preparation programs being tried at this time. One of them seeks out graduates of associate degree occupational programs as teacher candidates. Another approach draws upon retired military officers and industrialists.

The fourth iimplication deals with the urgent need to have junior colleges involved in much experimentation and research in the curriculums of occupational education. Again, because of the rapid changes going on in technology, curriculums must be continuously examined, evaluated, updated or disgarded. There is a crucial need to find ways of relating the social sciences and humanities to occupational programs in ways not yet tried. The role of the general educator, because of the inflexibility of so many traditional liberal arts teachers, has been given a very bad reputation in occupational education circles. Much more experimentation, such as that conducted by Stern (13:690-730) relative to environments for learning, can be designed for and performed in occupational education programs. Also in the realm of experimentation, competently prepared programs of cooperative work experiences that are centered around student development and learning are natural endeavors for community colleges. Much serious

investigation must be conducted in curriculum construction, including reliable methods of obtaining the pertinent features of a cluster of occupations from the world of work. Predicting curriculum and program needs for five or ten years ahead is receiving some attention (14: 17-21), but a much greater effort in this direction is required.

In conclusion, the implications all point to an increased role of higher education in the development of occupational programs. If the junior colleges can achieve sufficient maturity, superior leadership, and good occupational program teachers, they could assume the role of being the major educational institution serving as centers of occupational education programs within the next few years. If they fail to grow into this all important role, then society will initiate other institutions for occupational education (such as Trade and Technical Colleges, Post-secondary Area Vocational Centers). If this trend takes hold, there will be a strengthening of the old dualistic philosophy - occupational education along side of but separate from the liberal arts. Should there be a large scale resurgence of the dual school system (this time at the higher education level), society as a whole will suffer for it - since neither the academically oriented community college or the narrowly conceived work-oriented trade and technical college will be strong institutions. The emergence of the comprehensive, multi-level programs kind of community junior college is perhaps our last chance to nullify the ill effects of the separatism that emerged between academic and occupational education at the beginning of this century. The problems are admittedly very great, but the ultimate stakes are extremely high.

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14. See Chapter 3, which deals with predicting curriculum content for the future in some detail.

Chapter 3

A NEW APPROACH TO CURRICULUM CONSTRUCTION FOR OCCUPATIONAL PROGRAMS

Introduction:

The traditional approach to the development of occupational programs curriculum incorporates the job analysis technique. This involves a rather detailed analysis of the most important tasks to be performed by workers in that kind of a job. Once these tasks have been identified, the courses are then built around developing the skills and knowledge needed to perform them. The approach is still used by many occupational educators in the secondary schools and two-year colleges. Using job analysis for the purpose of identifying content of occupational courses has several critical disadvantages. Let us examine them in some detail.

1. Utilizing the job analysis as a vehicle for curriculum construction assumes that the job being analyzed is the job the student will go into upon graduation and remain on for some time thereafter. This is a very inaccurate assumption. It is safe to assume that virtually every known job today will be substantially different within the next several years. Actually, many present day jobs will change to such an extent in the next few years that, for all practical purposes, we can consider them as going out of existence and being replaced with new jobs (which in turn will disappear). Therefore, the job analysis technique, a reliable and appropriate vocational curriculum development technique several generations ago, is an approach that will only guarantee us almost immediate curricular obsolescence.

2. Because of its obsequious relationship to the "on-the-job" specifics, there is an inherent danger of arriving at the conclusion that an inordinate amount of elaborate, highly specialized, and astronomically expensive equipment is needed to put the program into operation. This is a trap that vocational educators have rather consistently fallen into since the advent of the manual training movement back at the turn of the twentieth century. The two-year colleges are not exceptions, many of them have developed the same hang-up. The crux of the hang-up is believing that the institution should train occupational students in the performance of certain highly specialized tasks that require the use of highly specialized equipment, which leads the institutions into believing that they must invest in the purchase of the same.

An increasingly common example of being caught in this kind of a maelstrom can be seen in many of the two-year colleges that have committed huge sums of money for the purchase of computers. It should be pointed out that some of these schools have well planned strategies such that the computer is heavily utilized and more nearly pays for itself. But there are even more two-year colleges that invested in computers for instructional purposes and not long after its arrival on campus have learned that a new generation of computers have come into being. Yet the college hadn't really recovered from their first computer investment and the trade-in value is short of being scandalous. At the same time the soul-shaking thought comes up that maybe, since that computer is becoming obsolete, the training they are conducting with it is also passe. How does a responsible President approach his trustees with this dilemma? Can he in all conscientiousness request that another computer of the latest generation be purchased? After all, it's only been a few years since the other one was purchased and only a few graduates have been turned out to industry (and only a few semesters of marks and other administrative records have been stored). If an economy minded trustee should perform one simple division problem (i.e. the number of computer student graduates divided into the cost of the computer), the per student cost would be found to be unbelievable. This kind of experience, where expensive specialized equipment loses much of its modernism in a few years, helps to establish and perpetuate the belief that occupational education is very expensive and leads many colleges to feel that they cannot afford to conduct many occupational programs. The irony of it all is that the poorly thoughtout and ill designed programs are the expensive ones (as described above). Well thought-out and carefully designed programs are generally much more reasonable in cost and can be justified in a good cost-analysis investigation.

The development of elaborate laboratories and shops, which almost invariably become outdated and are unnecessarily expensive, are frequently used in ways that are educationally indefensible. It is questionable if, in many cases, it can really be called education in the real sense of the word. Often times, the conducted activities are nothing more than out-and-out training for specific tasks on specific equipement (that is already either outdated or on the way of becoming so). There is no question here as to the importance of such training in terms of the needs of certain industries. The real question is: Shouldn't such training be provided by industry with their equipment in their facilities at the time they demand workers with these skills? In other words: Isn't this really just another kind of "on-the-job"

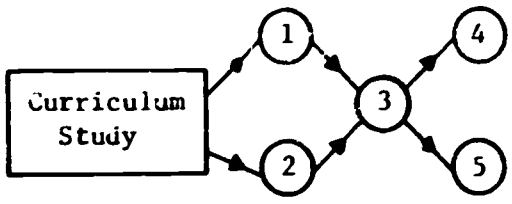
training rather than education? It seems that this is especially true now, because of the very rapid changes going on in the work world. The contention here is that the two-year college should not serve as a "service station" for the more transient skill needs of business and industry. This is in effect subsidizing industry for the cost of developing skills in the performance of a group of tasks that they should assume, and can do more effectively. Now that we have amply criticized this approach, it is reasonable to ask: How should two-year college occupational programs be designed?

The Cognitive Approach:

Perhaps the basic tenet behind modern day curriculum construction is that occupational programs should be designed such that the graduate enters the world of work with the real entry-level abilities - a mental attitude that assures him a maximum degree of resiliency and flexibility. The one sure thing we know about the world of work he is entering is the fact that whatever it is when he enters it, it will surely be different shortly thereafter. Therefore he needs to be resilient so that he can be capable of responding constructively to the on-the-job changes that occur with such great frequency. Furthermore, he must be flexible in his attitude, so that at the appropriate time he can leave the scene of his present work, enter into a period of additional education and/or training, and then return to the work world in a different job and role.

One of our most important tasks as educators, is to provide the student with those educational experiences which will foster the growth of these attributes. One approach seeking the curricular experiences that will enhance the development of these characteristics in the students is to base the program design on the cognitive aspects of that cluster of occupations - i.e. design it as a knowledge-based program instead of a skill-based one. An examination of how such an approach can be used is the main theme of this chapter.

It is a truism that occupational educators are already beset with an array of problems that range from winning financial support for their programs to recruiting students into them. How can the assignment of this additional task result in the successful development of well designed occupational curriculums? The approach indicated on the following page also illustrated in the form of a flow diagram in Figure 1, is suggested for consideration:



FLOW DIAGRAM OF THE PROPOSED CURRICULAR DESIGN

Figure 1

1. Identify those cognitive elements that are considered vital for the preparation of the student for that occupational cluster <u>today</u>.

2. Identify those cognitive elements that are considered vital for the preparation of the student for that occupational cluster <u>as it is expected to be in ten years</u>.

3. Establish the commonalities between 1 and 2 above. These are the cognitive elements that will receive top priority in the curriculum to be designed.*

4. Construction of the curricular components which will accommodate the findings of the investigation.

5. Establish an internal evaluation mechanism in the curriculum so as to provide a continuing check on achievements of objectives and relevancy of the elements within the curriculum.

The same approach to curriculum design is viewed with great skepticism by many occupational educators. The "crystal-ball" approach, an attempt to look into the years ahead, is a radical departure from the usual. The job-analysis method of developing curriculum, just described in a preceding paragraph, is really the "rear-view mirror" approach. As stated earlier, there are an increasing number of indications that future occupational trends can not be determined by looking behind us. The only fact derivable from looking to the past is that changes are going to continue coming, and there is great likelihood that they may even come at a faster rate than before. This author feels that pre-

* Those most vital elements found in Step 1 that fail to appear in Step 2 are those cognitive ingredients predicted to be of little value in the future. Therefore they can be included in the curriculum for a limited time (such as the first one or two years) and then deleted or phased out after that time.

dictive curriculum planning (i.e. the crystal-ball approach) can be a successful technique for identification of curricular content for occupational programs. The approach does have some hazards; the key to successful implementation of this method lies in great part with the competence of the crystal ball gazers.

How are competent crystal ball gazers identified? The persons finally selected to help identify the cognitive elements needed for that occupational cluster as it is expected to be in ten years must be qualified experts in the field. The criteria for the identification of a true expert could be:

a. he have a macro-type knowledge of his field;
b. he be a recognized leader in his field, as indicated by his position and record of achievement;
c. he be vitally concerned with predictive planning of this sort.

These criteria can be made quite specific for a particular occupational cluster, as is demonstrated in a later paragraph. Another important aspect of step 3 is th. inclusion of a clear-cut method for phasing-out the curricular materials as they become obsolete. Educators are notorious for resisting the discontinuance of old programs and courses*. This trap can be avoided in most cases by building in the mechanism for dropping those aspects of the program deemed obsolete or irrelevant by the appearance of certain predetermined symptons. The same approach can and should be utilized for entire programs, of course. It's about time educators mustered enough courage to institute methods for "burying" courses and programs when their day of reckoning has arrived.

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* The common retort to the question "Why don't you get rid of that program?" falls in two categories: 1. "And what will we do with the faculty we have teaching it?" 2. "What will we do with all that laboratory (shop) equipment?" The answer to both questions is a hard one - "get rid of them.'

Use of the Approach: An Example

The cognitive elements referred to in the preceding approach will appear as curricular topics or elements in the occupational program. The curricular topics are obtained from the select group of individuals categorized as experts in that field. A study using this overall approach with several modifications was recently conducted (1). This study was entitled "A Study to Determine a Common Core of the Curriculum for Community College Electronic Technology Programs."

One of the major objectives of that effort was to develop an approach to curriculum construction that would be a significant step toward the preparation of Electronic Technicians with the proper foundational cognitive ingredients and subject skills such that they can be easily retrained for new positions as they emerge and the old positions disappear. In this way, the core curriculum developed by the suggested approach would hopefully contribute toward the development of a more stable technician force by educating the Electronic Technician for the changes that lie ahead. The contention here is that this same overall approach can be used in the development of curriculum for any of the occupational clusters in the two-year college area.

By utilization of this approach, it was possible to arrive at four curricular recommendations. Using these recommendations as a basis, two model curriculums were designed in which it was felt the needs of the technician ten years from now would be met. The four recommendations encompassed:

1. The topics in electronics to be included in the curriculum.

2. The electronics topics in existing programs that should be dropped from the curriculum.

3. The topics in mathematics to be included in the curriculum.

4. The required academic level of the curriculum.

The first model curriculum was developed for the non-transfer associate degree program in electronics technology. This writer believes that ninety percent of the electronic technology programs should be at this academic level. Based on the results and a survey of the literature, it was suggested that about ten percent of the programs be the first two years of a baccalaureate program for technicians. The second model curriculum was developed for a program at that academic level.

The overall objective of the study was to identify those topics that should form the basis of the core curriculum such that the graduate would be best prepared to meet the tasks of the job cluster ten years fr now. To achieve this major objective, a series of sub-objectives were established, which can be stated in question form in the following manner:

A. What are the topics perceived by a group of educators and industrialists to be essential for the Electronic Technician of <u>today</u>?

B. To what extent do the educators and industrialists agree on these topics?

C. What are the topics perceived by a group of educators and industrialists to be essential for the Electronic Technician of <u>ten years from now</u>?

D. To what extent do the educators and industrialists agree on these topics?

E. What are the topics in present day Electronic Technology programs that are considered to be of little or no value for the technician of ten years from now?

One of the critical points in the study was in deciding how to select the items to be used in the questionnaire. It was felt that the most objective method for selecting these items was by utilization of a group of experts. This raised the question on how to define an "expert" for the purpose of this study. After considerable thought, each expert was selected on the basis that he is recognized as a leader in the field of Electronic Technology by use of one or more of the following criteria: (2)

1. He holds a high position, which deals with the hiring, supervision, and training of technicians in an Electronics Industry.

2. He is an active participant in the formulation of policies of the American Society of Engineering Education or the Institute of Electrical and Electronic Engineers.

3. He is an author of electronic publications of national reputation.

4. He is a holder of a responsible position dealing with Electronics in a nationally recognized college or university.

A final group of ten experts was chosen, which was composed of six educators and four industrialists.

A letter, describing the study and requesting their active assistance, was sent to each of the selected experts. An excellent response from them was obtained. Those topics most frequently listed by them became the questionnaire items. The result was a questionnaire that consisted of fifty electronic items and twenty-two mathematics items (3).

The next step was the actual construction of the questionnaire. Each item within the questionnaire was made to require two responses (see the addendum at the end of the chapter). The first response, under the category of NOW, dealt with the relative importance of that item in terms of the needs of the present day Electronic Technician. The second response for each item, under the category of 10-YEARS FROM NOW, was concerned with how important the respondent felt that same item would be for the Electronic Technician of ten years from now.

Every response was made on a continuous type scale that was graduated from right to left with the values of 0, 0.5, 1.0, 1.5, 2.0, 2.5, and 3.0. The scale of values used was:

3 = very essential
2 = important but less essential
1 = of only limited value
0 = unrelated or of no value

By use of this technique, each respondent was able to evaluate every questionnaire item twice, first in terms of its value for the present day electronic technician and then in terms of its value for the technician of ten years from now. The numberical values assigned to the NOW responses and the 10 YEARS FROM NOW responses furnished the data from which the statistical analysis was made.

Let us next consider how the respondents were selected. Being an occupational type curriculum, it was considered important to have two groups of respondents. These were:

1. The Heads of Electronic Technology programs in community colleges and technical institutes.

2. The Heads of Technical Personnel in selected electronic industries.

The entire group of respondents was comprised of 184 educators and 167 industrialists, a total of 351 respondents.

The Statistical Analysis:

Three statistical techniques were used to help analyze the results in terms of the objectives. First, a rank order coefficient test was used to determine the degree of agreement between the educators and industrialists (4). A special t-statistic, usable with dependent pairs of responses, pointed out those items in which the respondents assigned significantly different values between the NOW and 10 YEARS FROM NOW responses (5). The third technique utilized another t-statistic, which identified those items in which disagreement existed between the educators and industrialists (6).

The Results:

From the statistical evaluation of the responses came those topics that were recommended for the curriculum considered necessary for the electronic technician of today and for ten years from now. The most highly valued topics dealt with solid state devices and basic computer circuitry. Also of significance was that it was possible to point to certain topics in present electronic technology curriculums that should be removed because of their limited worth to the present day technician and their inappropriateness for the technician of ten years from now. All of these items dealt with vacuum tube circuitry and vacuum tube devices.

The project was carried one step further in that two model curriculum outlines were developed around those topics found to be the most valuable for the technician of today and ten years from now. These are presented in Tables 1 and 2. It is believed that the model curriculum outlines, if used in conjunction with recognized principles of sound curriculum planning can serve as one of the bases for the development of viable Electronic Technology programs.

Conclusions:

Careful predictive curriculum planning is of vital concern today because of the rapid rate of change that is occurring in all occupational areas. It is believed that the approach described here can be utilized in the planning of other occupational curriculums. This approach, in the opinion of this writer, overcomes the serious disadvantage of leaving curriculum planning up to the abilities and biases of one individual. An occupational curriculum must be sufficiently broad to encompass the national characteristics found in that occupational cluster. The contention here is that such a broad view of the curriculum can be best achieved by incorporating the use of well identified experts from both industry and education in that occupational cluster.

Recapping the approach to curriculum planning described here consists of the following steps (see Figure 2 for the flow-diagram):

1. Establishment of a set of criteria for the purpose of identifying experts in the occupational field to be considered.

2. Formation of the panel of experts (both industrialists and educators to be included).

3. Extraction of the most important topics as seen by the board of experts.

4. Construction of a questionnaire or other survey instrument from those topics obtained from the experts.

5. Selection (by recognized statistical means) two groups of respondents:

    a) Educators who teach in existing programs of the same type.

    b) Industrialists who employ the graduates of the existing programs.

6. Establishment of the statistical techniques for the analysis of the data.

7. Conduct of the survey.

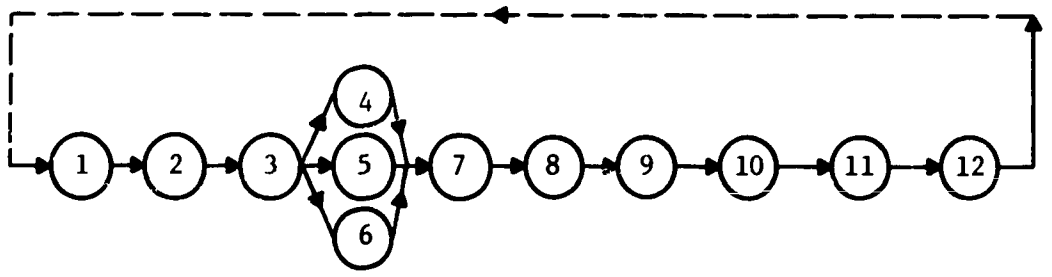
8. Development of recommendations from the results.

9. Translation of recommendations into a core curriculum.

10. Submission of the core curriculum to a special curriculum committee for the purpose of filling out the program and readying it for implementation.

11. Implementation in the offerings of the two-year college.

12. Re-examination of the curriculum at least every five years on a complete basis.



Flow Diagram of Described Curriculum Planning Approach

Figure 2

TABLE I. MIDDLE-LEVEL MODEL CURRICULUM

Course	Semester hours		Selected topics
First Semester			
Electronics I	3		P-N junction diodes, tunnel and zener diodes, silicon-controlled rectifiers, E-I characteristics (diode and transistor)
Electrical principles I	5		Introduction and review of general mathematics, simple linear equations, algebraic processes, slide rule
Mathematics I	3		
		11	
Second Semester			
Electronics II	3		Transistors (p-n-p and n-p-n), current in solid-state devices, E-I characteristics (diode and transistor), dynamic parameters of electronic devices.
Electrical principles II	5		
Mathematics II	3		Algebraic processes, elementary topics in geometry and trigonometry, slide rule
		11	
Third Semester			
Electronics III	6		Transistor multivibrators, transistor amplifiers, feedback effects, filters, regulated power supplies
Mathematics III	3		Application of number systems, logic systems
		9	
Fourth Semester			
Electronics IV	5		Logic circuits (basic); techniques for triggering, gating, synchronization; techniques for storing and comparing
Electronics specialty	3		
		8	
		39	

TABLE II. UPPER-LEVEL TRANSFER MODEL CURRICULUM

Course	Semester hours	Selected topics
First Semester		
Electronics I	3	P-N junction diodes, tunnel and zener diodes, silicon-controlled rectifiers, E-I characteristics (diode and transistor)
Electrical principles I	5	
Mathematics I	4	Introduction and review of general mathematics, simple linear equations, algebraic processes, elementary topics in geometry and trigonometry, slide rule, vectors, logarithms
	12	
Second Semester		
Electronics II	3	Transistors (p-n-p and n-p-n), current in solid-state devices, E-I characteristics (diode and transistor), dynamic parameters of electronic devices.
Electrical principles II	5	
Mathematics II	4	Graphs, simultaneous linear and quadratic equations, algebraic and trigonometric functions, complex numbers, vector algebra
	12	
Third Semester		
Electronics III	6	Transistor multivibrators, transistor amplifiers, feedback effects, filters, regulated power supplies,
Mathematics III(A)	3	Advanced algebra, advanced graphics, topics in analytical geometry
Mathematics III(B)	2	Number systems and their applications, Boolean algebra
	11	
Fourth Semester		
Electronics IV	5	Logic circuits (basic); techniques for triggering, gating, synchronization: techniques for storing and comparing
Mathematics IV	4	
	9	
	44	

References:

1. This was a doctoral dissertation by the author at the State University of New York at Buffalo (Buffalo, New York), completed in 1966.

2. Of the ten selected experts, three of them met three of the four established criteria. The remaining seven experts met two of the four criteria. Therefore, it can be seen that the experts were well qualified in terms of the selected criteria.

3. A breakdown of the distribution of topics selected by the experts show that:

   7 experts chose 15 topics
   6 experts chose 37 topics
   5 experts chose 3 topics
   4 experts chose 19 topics
   3 experts chose 2 topics

   It should be noted that no topic was selected for incorporation into the questionnaire unless it was deemed essential by at least three of the experts. Most of the topics (52 of the 72) were classified as essential by at least six of the experts.

4. In order to conduct the rank order coefficient test, it was first necessary to compute the arithmetic means for each of the questionnaire topics. In this case the means were computed for the topics for the following categories:
   1. Educators: NOW 2. Educators: 10 YEARS FROM NOW
   3. Industrialists: NOW 4. Industrialists: 10 YEARS FROM NOW

   These means are the value used in the ranking process. Note that four arithmetic means wre computed for each topic.

   Then the topics were ranked, with the item having the highest mean assigned the rank order of 1, down to the last rank order for the item with the lowest mean (the lowest rank order was 22 for the mathematics items and 50 for the electronics items). The final step in the ranking process was to combine the following groups of topics:

1. Mathematics NOW (Educators and Industrialists)
2. Mathematics 10 YEARS FROM NOW (Educators and Industrialists)
3. Electronics NOW (Educators and Industrialists)
4. Electronics 10 YEARS FROM NOW (Educators and Industrialists)

Next, the difference in the ranking of each item (called D in the equation below) was determined. Example:

Item 1 Electronics NOW (Educators versus Industrialists) - Educator rank = 38, Industrial Rank = 48; Difference in Ranking (D) = 10 and $D^2 = 100$. This process was repeated for all of the Electronics NOW items, and the sum of the D^2 were found,

$$D^2_{\text{total}} \qquad D^2_1 \qquad D^2_N$$

where N = the number of questionnaire items being considered for that rank order coefficient test. (22 for mathematics items and 50 for the electronics items)

Using the computed D^2 total, and N, the rank order coefficient can be calculated from,

$$\text{rho} = 1 - \frac{D^2_{\text{total}}}{N(N^2 - 1)}$$

This test was computed for four groupings, and the values obtained were:

Math NOW (Educators vs Industrialists) r = + 0.990
Math 10 YEARS FROM NOW (Educators vs Industrialists) r = + 0.951
Electronics NOW (Educators vs Industrialists) r = + 0.966
Electronics 10 YEARS FROM NOW (Educators vs Industrialists) r = + 0.971

The above rho values indicate that a high level of agreement existed between the educators and the industrialists in the ranking of the items.

5. When comparing the NOW and the 10 YEARS FROM NOW responses of the same respondents it is assumed that the two response values are dependent. Therefore a t-statistic that takes this element of dependency into account must be used. The following t-statistic was used, since it permits the following assumptions:

a. The variance of the NOW (a) responses and the variance of the 10 YEARS FROM NOW (b) responses do not have to be equal.
b. The values of the NOW and the 10 YEARS FROM NOW responses for each questionnaire item are dependent.

$$t = \frac{\bar{d}}{\frac{sd}{(N)^{1/2}}}$$

where

$\bar{d}$ = mean of the sum of the differences between the NOW and 10 YEARS FROM NOW responses of each item.
sd = standard deviation
N = number of respondents

6. This t-statistic compares the response of the educators to each item to the response of the industrialists to the same item.

$$t = \frac{\bar{B} - \bar{A}}{sd\left[\frac{1}{NA} + \frac{1}{NB}\right]^{1/2}}$$

where

$\bar{B}$ = mean of the industrialist responses to that item
$\bar{A}$ = mean of the educators responses to that item
sd = standard deviation
NA = number of educator respondents
NB = number of industrialist respondents

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

A. The Electronic Devices listed below are to be considered for inclusion in the Electronics Curriculum. Indicate, on the appropriate scale, your belief about the importance of each for:
a) the present day Electronic Technician (NOW)
b) the Electronic Technician of 10 YEARS FROM NOW

	NOW	10 YEARS FROM NOW
1. Vacuum Diode	3 2 2 0	3 2 2 0
2. Gas Diodes	2.5 1.5 0.5	2.5 1.5 0.5
3. P-N Junction Diodes	3 2 1 0	3 2 1 0
4. Tunnel and Zener Diodes	2.5 1.5 0.5	2.5 1.5 0.5
5. Silicon-controlled Rectifiers	3 2 2 0	3 2 2 0
6. Unijunction Transistors	2.5 1.5 0.5	2.5 1.5 0.5
7. Transistors (PNP and NPN)	3 2 2 0	3 2 2 0
8. Multigrid Vacuum Tubes	2.5 1.5 0.5	2.5 1.5 0.5
9. Photo Cells and Photo Tubes	3 2 1 0	3 2 1 0

B. The Fundamentals of Electronics Devices listed below are to be considered for inclusion in the Electronics curriculum. Indicate, on the appropriate scale, your belief about the importance of each for:
a) the present day Electronic Technician (NOW)
b) The Electronic Technician 10 YEARS FROM NOW

10. Thermionic emission	3 2 1 0	3 2 1 0
11. Current in solid state devices	2.5 1.5 0.5	2.5 1.5 0.5

	NOW	10 YEARS FROM NOW
12. E-I Characteristics (Diode and Transistor)	3 2 1 0	3 2 1 0
13. E-I Characteristics (Multi-grid vacuum tube)	2.5 1.5 0.5	2.5 1.5 0.5
14. Dynamic parameters of electronic devices	3 2 1 0	3 2 1 0
15. Static parameters of electronic devices	2.5 1.5 0.5	2.5 1.5 0.5
16. Equivalent circuits for electronic devices	3 2 1 0	3 2 1 0

C. The types of circuits for Pulse Forming and Shoping listed below are to be considered for inclusion in the Electronics curriculum. Indicate, on the appropriate scale, your belief about the importance of each for: a) the present day Electronic Technician (NOW); b) the Electronic Technician of 10 YEARS FROM NOW

17. Diode clippers, clampers, and limiters	3 2 1 0	3 2 1 0
18. Vacuum tube Multivibrators (bistable, astable, monostable)	2.5 1.5 0.5	2.5 1.5 0.5
19. Transistor Multivibrators (bistable, astable, monostable)	3 2 1 0	3 2 1 0
20. Blocking Oscillators (tube)	2.5 1.5 0.5	2.5 1.5 0.5
21. Blocking Oscillators (transistors)	3 2 1 0	3 2 1 0
22. Schmitt trigger (tube)	2.5 1.5 0.5	2.5 1.5 0.5
23. Schmitt trigger (transistor)	3 2 1 0	3 2 1 0
24. AND and OR Logic Circuit	2.5 1.5 0.5	2.5 1.5 0.5
25. NAND logic circuits	3 2 1 0	3 2 1 0

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

	NOW	10 YEAR FROM NOW
26. NOR logic circuits	2.5 1.5 0.5	2.5 1.5 0.5

D. The pulse circuits techniques listed below are to be considered for inclusion in the Electronics Curriculum. Indicate, on the appropriate scale, your belief about the importance of each technique for:
a) the present day Electronic Technician (NOW)
b) the Electronic Technician 10 YEARS FROM NOW

27. Techniques for triggering, getting, synchronization	3 2 1 0	3 2 1 0
28. Counting techniques	2.5 1.5 0.5	2.5 1.5 0.5
29. Techniques for Storing and Comparing	3 2 1 0	3 2 0 1

E. The Amplifiers and the methods of circuit analysis listed below are to be considered for inclusion in the Electronics Curriculum. Indicate, on the appropriate scale, your belief about the importance of each for:
a) the present day Electronic Technician (NOW)
b) the Electronic Technician 10 YEARS FROM NOW

30. Triode and multigrid vacuum tube amplifiers	3 2 1 0	3 2 1 0
31. Transistor amplifiers	2.5 1.5 0.5	2.5 1.5 0.5
32. Analysis (linear equivalent circuit and graphical	3 2 1 0	3 2 1 0
33. Calculations (E and I gains, decibels)	2.5 1.5 0.5	2.5 1.5 0.5
34. Coupling (transformer and R-C)	3 2 1 0	3 2 1 0

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

	NOW	10 YEARS FROM NOW
35. Amplifiers (power, push-pull tuned)	2.5 1.5 0.5	2.5 1.5 0.5

F. The Feedback Oscillators and their properties listed below are to be considered for inclusion in the Electronics Curriculum. Indicate on the appropriate scale, your belief about the importance of each for:
   a) the present day Electronic Technician (NOW)
   b) the Electronic Technician 10 YEARS FROM NOW

36. Feedback (general equation, voltage and current considerations)	3 2 1 0	3 2 1 0
37. Cathode follower	2.5 1.5 0.5	2.5 1.5 0.5
38. Emitter follower	3 2 1 0	3 2 1 0
39. Collector-base feedback	2.5 1.5 0.5	2.5 1.5 0.5
40. Plate-grid feedback	3 2 1 0	3 2 1 0
41. Feedback effect on gain, bandwidth, noise, stability, and output impedance	2.5 1.5 0.5	2.5 1.5 0.5

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

G. The Principles of Modulation and Demodulation listed below are to be considered for inclusion in the Electronics Curriculum. Indicate, on the appropriate scale, your belief about the importance of each for:
   a) the present day Electronic Technician (NOW)
   b) the Electronic Technician of 10 YEARS FROM NOW

	NOW	10 YEARS FROM NOW
42. Types of Modulation (Amplitude, frequency, Pulse-code)	3 2 1 0	3 2 1 0
43. Methods of Modulation (diode, grid, plate)	2.5 1.5 0.5	2.5 1.5 0.5
44. Types of Detector Circuits (ratio, diode AM)	3 2 1 0	3 2 1 0
45. Types of Receivers (AM, FM, Multiplex)	2.5 1.5 0.5	2.5 1.5 0.5
46. Types of Transmitters (AM, FM, Multiplex)	3 2 1 0	3 2 1 0

H. The types of Power Supplies and their associated principles listed below are to be considered for inclusion in the Electronics Curriculum. Indicate, on the appropriate scale, your belief about the importance of each for:
   a) the present day Electronic Technician (NOW)
   b) the Electronics Technician 10 YEARS FROM NOW

	NOW	10 YEARS FROM NOW
47. Rectifiers (half-wave and full-wave	3 2 1 0	3 2 1 0

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

	NOW	10 YEARS FROM NOW
48. Bridge Rectifiers	2.5 1.5 0.5	2.5 1.5 0.5
49. Filters (R-C, R-L, L-C, and multiple-section)	3 2 1 0	3 2 1 0
50. Regulated power Supplies	2.5 1.5 0.5	2.5 1.5 0.5

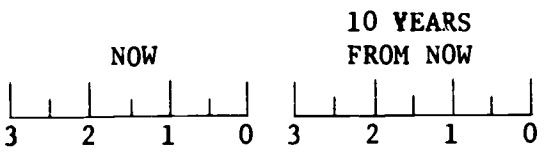
I. The Topics in Mathematics listed below are to be considered for inclusion in the Electronics Curriculum. Indicate, on the appropriate scale, your belief about the importance of each for:
a) the present day Electronic Technician (NOW)
b) the Electronic Technician of 10 YEARS FROM NOW

	NOW	10 YEARS FROM NOW
51. Introduction and Review: decimals, powers of ten, units, dimensions, significant figures, estimation	3 2 1 0	3 2 1 0
52. Simple Linear Equations: use of formulas in solving scientific problems, expressing word problems as equations, review of basic algebraic laws, solving simple problems with formulas and linear equations.	2.5 1.5 0.5	2.5 1.5 0.5

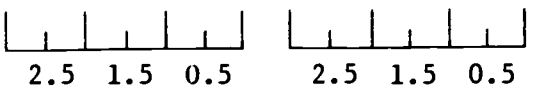
THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

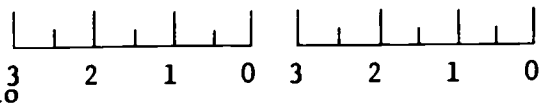
53. Algebraic Processes: rules for algebraic processes, literal numbers, factoring special products, fractions, powers, roots, fractional exponents, ratio and proportion, variation, operations with radicals.



54. Elementary Topics in Geometry and Trigonometry: Angle measurement, the circle and related problems, triangle and related problems, the trigonometric functions, solution of right triangles by trigonometry, simple trigonometric equations.



55. The Slide Rule: Multiplication, division, ratio and proportion, powers and roots, trigonometry.



THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

		NOW	10 YEARS FROM NOW
56.	Vectors: components of a vector, resolution of vectors, parallelogram and triangle methods, vector solutions of force, displacement and motion proglems, vectors and the trignometric functions, the vector polygon.	2.5 1.5 0.5	2.5 1.5 0.5
57.	Logarithms: base 10 and natural logs, use of log tables, calculations with logarithms.	3 2 1 0	3 2 1 0
58.	Graphical Representation: Interpreting and plotting graphs, graphs of linear equations, concept of slope, point-slope form of equation of a straight line, slope intercept form, the linear function.	2.5 1.5 0.5	2.5 1.5 0.5

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

	NOW	10 YEARS FROM NOW
59. Simoultaneous Linear Equations graphical solution, algebraic solution, determing constants, problems with three or more unknowns, determinants.	3 2 1 0	3 2 1 0
60. Quadratic Equations: definitions, solutions by factoring and by quadratic formula, nature and properties of roots, graph of the quadratic function, the parabola.	2.5 1.5 0.5	2.5 1.5 0.5
61. Algebraic functions: functional notation, rectangular and polar coordinates, polynominals, graphs and roots of polynominals.	2 1 0	3 2 1 0
62. Trignometric Function Analysis: law of sines, law of cosines, law of tangents, functions of half angles, sum of difference of two angles, multiple angles, trignometric functions, sinusoidal functions, harmonic motion.	2.5 1.5 0.5	2.5 1.5 0.5

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

	NOW	10 YEARS FROM NOW
63. Complex numbers: imaginary numbers, complex numbers, the J-operator.	3 2 1 0	3 2 1 0
64. Vector Algebra: Addition, subtraction, multiplication and division of complex numbers, multiplication and division in polar form.	2.5 1.5 0.5	2.5 1.5 0.5
65. Advanced topics in Algebra: sequences, arithmetic and geometric progression, series, convergence and divergence, harmonic series, binomial theorem.	3 2 1 0	3 2 1 0
66. Advanced Graphics: similarities and analogies, plotting experimental results, empirical relationships, elementary nomography, graphs of special equations.	2.5 1.5 0.5	2.5 1.5 0.5
67. Analytical Geometry: points in space, trigonometry in a rectangular system, tangents and curves, conic sections.	3 2 1 0	3 2 1 0

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

	NOW	10 YEARS FROM NOW
68. Differential Calculus: The application of the methods of calculus to the solution of problems in mechanics, heat, wave motion and technology problems.	2.5 1.5 0.5	2.5 1.5 0.5
69. Integral Calculus: application of calculus to the problems of industry and technology	3 2 1 0	3 2 1 0
70. Number Systems: base 10, number systems to other than base 10, detailed study of the base 2, fundamental processes in various number systems	2.5 1.5 0.5	2.5 1.5 0.5
71. Application of Number Systems computer math and limitations, the analog computer and applications, digital computer applications, basic programming techniques.	3 2 1 0	3 2 1 0
72. Logical Systems: Introduction to Boolean Algebra, addition and multiplication facts, truth tables, switching circuit algebra, AND-OR logic functions.	2.5 1.5 0.5	2.5 1.5 0.5

THE SCALE KEY

3. Very essential
2. Important but less essential
1. Of only limited value
0. Unrelated or no value

CHAPTER 4

IDEAS FOR AN EXPERIMENTAL COMMUNITY COLLEGE FOR URBAN YOUTH

Introduction:

To be truly an experimental institution, it would seem that there needs to be intensive involvement with individual faculty members, students, and administration as well as with the total organization of the college. Following are several relationships that could have a salutary effect upon the college that is embarked on serious experimentation on a total institutional basis:

1. A strongly supported, well financed office of institutional research can provide the overall direction for various studies and investigations relating to students, faculty, administration, manpower, curriculum, finance, facilities and other topics. Of equal importance is that this office can be, in addition to providing encouragement for the initiation of projects, the vehicle for their administration, evaluation, and for establishment of strategies for incorporation of the significant results in the institution's operations. This office could be the nucleus where the derived information from all the projects would be made to flow together into the very fabric of the college. It would seem that an office of institutional research which is prevented from playing this role is doomed to having only a minimum impact upon that college.*

2. An experimental college must first begin with a clear statement of its objective(s). In this case, the overall objective is to improve ways in which we can successful provide instruction for disadvantaged urban youth. This provides us with something to set our sights on. Now this needs to be translated into a program of some sort. Next comes the development of program elements - these are the specific activities and endeavors that enable us to have the program strike at the objective. The above goal (improved instruction for urban youth) must be an institutional-wide accepted objective, if it is to

* Philip H. Tyrrell eloquently addresses himself to this problem in "Notes on Experimental Projects and Institutional Research" in The Journal of Higher Education (Vol. XL, No. 6, June, 1969). Columbus: The Ohio State University Press (pp. 443-450).

> have a real chance of being achieved. The program being considered here is a specially designed course arrangement, unique in both it's content and sequence, so that it will make more sense to people with non-middle class backgrounds and traditions. Much of this chapter concerns itself with some of the program elements that might contribute toward meeting the objective of such a community college.

The Rationale for an Experimental Community College for Urban Youth Needed

It is common knowledge that urban youth have special characteristics which cannot be accommodated in the traditional community college. The urban youth being considered here are often labeled high risk students by many of the middle class educational institutions. The classification implies that these students, as a group, are expected to develop higher than usual dropout rates in college, and are special students in many other ways too (i.e. different from the usual middle class college youngster).

They are in the high-risk category because they possess a cluster of characteristics that reduce their probability of achieving academic success in middle-class oriented colleges. Some of these contraeducational factors are:

1. Lack of finances
2. Achievement of low scores in standardized tests
3. Erratic and/or unimpressive high school records
4. An inheritance of a cluster of race/class/cultural characteristics that set them even further apart from the average (middle class Caucasian) college student.

Added to these near overwhelming factors that augur ill for this type of young person is the manner in which higher education tends to view the problem (1:12):

> ... There is a fairly broad acceptance of the notion that public schools are a legitimate instrument of social change in this country, that part of their responsibility is to help improve opportunities for minorities and the poor; that same idea seems not to be as generally felt or shared by higher education institutions. (italics mine)

Some of these colleges that do feel some twinge of conscience about doing something for the educational problems of urban youth are debating how to do it. It is said by some that these students should be treated like any other student. Others feel special programs, primarily in the area of compensatory education, should be offered. In the first case, similar treatment can often keep the great majority of the urban poor out of the college; and those that do get in, experience considerable difficulty, so that a high drop-out rate develops among the group. In the second case, compensatory education is aimed at preparing the students to meet the initial entrance requirements of the traditional middle-class oriented curriculums. This is found to be very discouraging for youngsters who already have had many failures and frustrations. Both approaches call upon the student to change sufficiently to fit the traditional academic mold. Regardless of which approach is taken in a given institution, attrition and morale are still major problems. What does this indicate? In the opinion of this writer, the continued inability to attract, hold, and graduate urban youngsters with the backgrounds described earlier is evidence that the debate going on is nothing more than a lot of rhetoric on tangential issues. The heart of the problem seems to have gone unnoticed. Higher education, in its usual form, is a mechanism for the educating of youth whose background is such that they have been functioning within the mainstream of American middle class society. The urban poor youth are a different breed of student, sufficiently different to require a new type of college whose educational offerings would be just as irrelevant to the middle class student as the present offerings are irrelevant to this kind of student.

Such a college, if it was to have such an orientation, would have to be designed for this purpose and not be a modification of an institution that had a different original purpose. Because of the special demands that would be made upon members of such an institution, there appears to be an indication that new institutions could be most effective in such an effort (2:1226-27):

> ... There seems to be a predictable life cycle in most public and private organizations. A new organization, created to solve an urgent problem, tends to attract aggressive, entrepreneurially-oriented people. It has no ongoing responsibilities inherited from the past, no encrustations of past bureaucracy, no organizational ladder crowded with "play-it-safers" who have advanced by seniority and by keeping out of trouble. A new institution may be able to set a new pattern more easily and more efficiently, although given time it, too, can age and fall into the trap of "business as usual" and excessive bureaucracy.

One recent study (1) did find that the majority of the persons responsible for the direction of present high risk programs are not academicians. It was found that these leaders were from such previous positions as admissions officers, counselors, administrators and social workers. The various academic disciplines and individual faculty members have displayed relatively little interest in becoming involved with high rish programs. This is one more reason for suspecting that the establishment of special educational institutions for high risk students would not meet with heavy opposition from academic quarters. In fact, it may relieve many academicians of an underlying guilt feeling relative to their ignoral of the high rish student and the problems associated with him.

The attempt to accommodate the needs of the high risk student within the existing college environments presents still another problem worthy of mention at this point. Black students have been considerably sensitized to the polar characteristics of black power on one hand and white help on the other. The position of the black militants is that a Negro should not accept special help from members of the white race. Any Negro who does accept white assistance, in the opinion of the black power leaders, is allowing himself to be seduced away from his own (black) people. At the same time, refusal to accept such assistance in some cases can result in additional hardship and may possibly be the determining factor as to whether the black student can remain in college or is forced to drop out. Since neither the black power position or the acceptance of white assistance are completely acceptable, the black student is truly on the horns of a dilemma. Consequently, he displays feelings of ambivalence which can give rise to almost intolerable levels of frustration. The competing pressures can seriously interfere with or completely block the black students' academic progress, and often culminates in his withdrawal from the academic scene. How can the value conflict between black power modes and acceptance of white assistance be reduced? No one has found a solution within the traditional framework of higher education.

Some Characteristics of the Ghetto Population:

Let us take a moment to review a few of the basic statistics concerning the nation's ghetto population. It has been estimated that in March 1966, 12.5 million non-whites were living in all the central cities of the United States, and 12.1 million of them were Negroes. It is also estimated that 39 per cent of these people had below "poverty level" incomes (i.e. less than $3300 per year

for a four-person household.) It should be noted that the ghetto population, although only 7 per cent of our entire population, is almost entirely made up of Negroes. Of equal significance is the startling fact that most of the Negro population growth is occurring in the ghettos. More precisely, 89 per cent of the non-Caucasian population growth between the years 1960 and 1966 took place in our central cities. Assuming no substantive changes in public policies relative to this ghetto trend will take place, (a reasonably safe assumption) the nonwhite population growth of the future will continue to occur in the central cities. The National Advisory Commission on Civil Disorders has estimated that the central city Negro population will be about 13.6 million in 1970 and possible 20.3 million by 1985. By 1985, it is expected that the following cities will become over 50 per cent Negro in population (3): Chicago, Philadelphia, St. Louis, Detroit, Cleveland, Oakland, Baltimore, New Orleans, Richmond, and Jacksonville. It should be pointed out that Gary, Newark, and Washington, D. C. are already in that category.

It seems that this phenomenon has characteristics that are sufficiently different from past population changes in the United States to merit special attention. Several of the more important questions raised by this trend are as follows: 1. Can we really expect the existing modes of higher education to serve the needs of these persons? 2. Can and should ghetto youth be forced into some kind of a metamorphosis that would transform them into people that subscribe to the middle-class value of the white society? (3) Or is it more appropriate to mold new institutions of higher education to the specifications of their desires and needs?

Financial Considerations:

A look at the growth of the Gross National Product in past years is encouraging. During the 1960's, the average annual GNP growth has been 4.7 per cent in constant value dollars. Assuming that the Gross National Product will average an annual growth of 4 per cent for the remainder of this century, it will increase from $785 billion in 1967 to 54 trillion in the year 2000. Such a GNP growth (4 per cent annually) would enable the United States to accomplish the following (4:1160):

1. Double average consumption per household. The increase might be more evenly distributed by developing a higher quality in education and training for the labor force ...

2. Double, by 1975, education expenditures per pupil: eliminate elementary and secondary school dropout; increase college enrollments by 50 per cent.

At the present time, the annual rate of spending for higher education (nationally) is just over 1 per cent of the Gross National Product. It is believed in some quarters that this will increase to 2 per cent or higher in the next few years (5:14). Therefore, it appears safe to assume, both from the predictions of continued GNP growth and a rising rate of spending for higher education, that the financial resources needed for the establishment of new forms of higher education are available on a national basis. The crux of the problem centers on whether or not we possess the mental and social nimbleness to establish the right kinds of higher education institutions.

It is ironic to note that many programs initially intended to benefit the poor end up being of greatest benefit to the middle class and the wealthy.* Harrington (6) cautions us about the dangers of social and economic policies supposedly designed to solve problems of the poor. Let us consider several examples of what has already happened.

The housing programs, originally instituted ostensibly to provide housing for the poor, have in the long run evolved into a bonanza for the middle class and the rich - the people who have the income to qualify for the government insured mortgages. Equally astounding is one of the statements that came out of the Kerner Commission (3): they pointed out that the total tax write-off dollars on personal income tax returns for mortgage interest was twice the amount spent on public housing in 1962. Obviously, these tax write-offs are, in effect, subsidies to middle and upper class citizens, since they are the homeowners, not the poor. It should be stressed that these social policies served to increase the economic gap between the poor and the middle class.

Consider highway construction, a big business these days. Much of the financing for modern super highways is obtained from the federal government. The subsidization of these highway systems serve to further the differences between these two groups. The appearance of these elaborate highway systems provided the means for businesses and middle class people to move out of the inner cities, taking many of the jobs with them. At the same time, the onset of the age of the superhighway actually isolated the poor

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* Social Security is a clear cut example. Employed persons pay their Social Security on the first $7800 they earn, this represents a heavy deduction for an individual who earns $7800 or less, but is a relatively light deduction for persons earning $15,000 per year. (His entire annual Social Security deductions is half as much in percentage)

in the central cities. If this was accompanied by heavy subsidization of public transportation systems, the isolation effect would have been partially minimized. Such a move would have at least provided the poor with low-cost transportation to where many of the jobs have moved to - out of the central city. But popular support (i.e. middle class support) for public transportation into and out of the central cities is not as readily obtained as is support for additional super-highways between the central city and the middle-class suburbs (which is a subsidy for the middle-class mode of transportation - the automobile).

I think there is an important lesson to be learned from observing the outcomes of these (and similar) developments. Federal intervention tends to take on the character of the larger society - in the case of trying to establish ways of helping the minorities, this would run counter to helping -them (the minority). This means, in actuality, that the intervention of the federal government will tend to reinforce the existing society and would tend to oppose changing that society. This has already occurred, in the opinion of this writer, in the varied attempts to academically "tool up" the urban disadvantaged student so that he will fit into the conventional institution of higher education. This emphasis in trying to change the student for the purpose of fitting him into an existing institution falls far short of what is needed. What we really need is a new institution, one that is designed to prepare urban youth for living in this urban society.

Needed: Public Financing Controlled by the Ghetto Community:

How do we manage to obtain the federal intervention in the form of finances without the constraints we just mentioned? It is at best, a very difficult task, but can be managed if the funding is delivered with sufficient autonomy to permit its use in a manner that is determined locally. There is another trap in local control that must be avoided - it must not be administered with the traditional middle-class methods of running institutions of higher education (this would be the creation of more of the same and instead of providing help for the urban poor, it would end up providing increased opportunities for the middle class again).

The cycle can only be broken by the development of a new kind of higher education designed for the urban poor and evolving out of novel relationships with the key minority forces in the urban community. It might even be advisable to take certain organizational measures to prohibit middle-class whites from holding these positions

in the institution that would involve control of the finances, curriculum, and other institutional policies. In other words, special measures should be taken to see that the minorities are in the majority in this situation.

A Way out of the Transfer Trap:

One can envision a community-college type institution as being the front-end of the overall ghetto institution that would be authorized to issue baccaulareates as well as the associate degree. This aspect of the institution is extremely vital because of the transfer trap. It is safe to assume that youngsters who are granted associate degrees via novel and untried curricula and colleges will find that the traditional four-year college will balk at accepting them as full fledged third year transfer students. Furthermore, the usual kind of four-year college will not have the kinds of educational experiences and course-work required to provide continuity with the kinds of education these urban youths received in their unconventional institutions. Therefore, it seems that the only realistic solution to this problem is to not have to rely on the traditional colleges for transfer, but to establish the finishing work for the baccalaureate within this same novel institution. In this way, associate degree programs and baccalaureate degree programs can be inaugurated with a minimum of the traditional middle-class constraints. If successful, the result could be that the urban poor will have proportionately as many graduates with associate degrees and baccalaureate degrees as found in the middle-class segment of our society within a decade or so.

It seems reasonable to assume that academic degrees up to now have been middle-class instruments for the dichotomization of people. Recall that new approaches to academic degrees came about during the late nineteenth century and first half of the twentieth century as higher education took on new forms because of the impetus provided by the land-grant movement. Now there is a movement running through the very entrails of our society which is demanding that the minorities be allowed their place in the sun. In higher education, a manifestation of such a trend is that some educators feel it reasonable to devise new degrees that are not the property of the middle-class. The educators whose ideas on this are near the cutting edge of this movement feel that it is entirely proper and even urgently necessary that non-middle class modes of education be devised and used as the basis for non-middle class people to acquire academic degrees.

The Socio-Academic Environment:

The Social-Academic environment of such an experimental college is of crucial importance. There have been quite a few studies in recent years that delved into the mechanism behind various facets of group behavior. Let us review some of the more significant generalizations derived from these studies in four broad areas:

1. From Studies dealing with Attitudes and Group Behaviors:

   a. Individuals within a group tend to have attitudes that are consentaneous with those beliefs that are common to that group.

   b. An individual within a group will be most directed to the group-related task within the group situation that is clearly identified.

   c. A closely knit group of individuals develop strong pressures toward uniformity and conformity.

   d. As a group becomes more cohesive, it becomes more difficult for that group to adapt to changes in external conditions.

2. From Studies dealing with Productivity, Competition, and Cooperation:

   a. The productivity of a group is markedly reduced by the introduction of individual competition for rewards.

   b. A cooperative group environment results in greater group productivity than that found in a competitive group environment.

   c. Greater personal insecurity is more readily produced within the competitive group environment than in a cooperative group environment.

3. From Studies dealing with Group Problem Solving:

   a. When group problem solving is employed in those tasks in which no one solution is necessarily the correct one, the resultant solutions are more restricted in their range than would result if the problem solving is done on an individual basis.

b. When group problems solving is employed, the group often produces two lines of behavior among its members that are different to the point of being incompatible:

1. The emergence of a leadership role which tends to be destructive of the group for the sake of solving the problem.

2. The emergence of a role that aims toward preserving the group, which is a role that is negatively related to the solution of the problem.

4. From Studies dealing with Supervision, Productivity, and Morale:

a. Low productivity and close supervision are closely associated with each other.

b. High morale seems to be associated in a positive way with the degree of individual participation.

The above generalizations dealing with attitudes and group behavior, productivity-competition-cooperation, group problem solving, and supervision - productivity-morale, could be used as guidelines in the establishment of the socio-academic environment of the proposed experimental college. It is vital, I think, that the college environment be such that the sociointellectual activities of the students become important contributions to their socio-academic community. The idea of utilizing his collegiate achievements as a mechanism for his personal advancement at the expense of his associates (i.e. the spirit of competitiveness) should be eliminated or at least greatly minimized. Special efforts need to be made in which individuals' best intellectual efforts become part-and-parcel of the group enterprise. This might be the best way to develop that sense of social responsibilities in students - a requirement for the establishment and maintenance of a viable student community. Admittedly, this is easier said than done. We must experiment with new ways to establish family-type solidarity, fraternity-like feelings, and strong friendships among the students. The poor-risk student needs to establish these kinds of relationships more than anything else - even the academic aspects of this experiment take a role of secondary importance to this.

Advantages of a Residential College:

A very important aspect of the proposed experimental college is that it be residential in nature. It is easier to establish arrangements for better student-teacher and teacher-student relationships when the students live on campus. The college must become a small community for the student - small in the sense that he can feel that he is an integral part of that community. This is the primary reason we are opting for the residential aspect of this proposal.

A richer personal relationship between student and teacher needs to be developed where the teacher is more concerned with what is going on in the mind of the student, and correspondingly less concerned with subject content per se. We must guard against the tendency toward the development of student anonymity. This is a somewhat natural tendency for disadvantaged students, who learned how to become inconspicuous in a hostile environment at a very early age. This kind of personal relationship between student and teacher is a vital ingredient in the fostering of greater student involvement and engrossment in the college community, and this involvement must be aggressively sought after by the planners of this proposed institution. The successful establishment of the community-type atmosphere can provide the all important setting which can lead to the inauguration of real changes in the students.

It should be emphasized that the instructor and the courses he teachers have only limited importance for student development, and even then it is limited by the extent to which his teachings supplement the influence of the student peer society. The key is to establish the specialized educational setting and residential environment in which the student peer culture will evolve in those directions that lead to positive student development. Because of the contra-educational influences found within the natural homes of most poor-risk students, it is even more imperative that they be removed from that environment and placed in a residential-college situation like that described here.

Students on Contract:

The matter of student finances is of vital concern, especially with the disadvantaged student, who doesn't even have the financial resources to support himself - never mind pay for an education. It is suggested that he be enrolled on a contract basis. By this I mean he be given a contract in which he would be guaranteed room and board, medical-dental care, and sufficient funds for clothing, recreation, and other needs during the period of his contract. He would in fact be a paid student.

The rationale for such a plan is that the development of the poor-risk student into a person who can contribute toward the good of his community is a worthwhile objective of our society and warrants the required finances that would enable him to be completely self-supporting. We can draw an analogy with an individual who is employed by some business, industry, or service-related concern. What's wrong with viewing such a student as a public employee? The product of his labors is self-betterment - a most prized societal commodity and certainly worthy of societal investment. This approach would once and for all deal a much deserved death blow to the archaic idea that students are being given a dole - as a member of our society he is qualified to be employed as a student.

Other Considerations:

The college environment should be designed such that it really serves as the bases for many special educational activities. High priority should be given to the provision of special places and special activities in which the students can indulge in self-testing whenever he feels it necessary. The student should be able to try himself against a graduated series of challenges and difficulties. They can range in variety from the purely cognitive type to the artistic and to the physical. Special programs of various lengths can be temporarily set up for the purpose of encouraging students to deliberately break away from a habitual mold of action and to try living out some new roles. We should come to grips with the very simple fact that vicarious experiences are far from sufficient for the poor-risk student (as indeed they are often woefully inadequate for the student of middle class origins). He very much needs the opportunity to have real experiences that lie outside his usual mold of thought and action and habits. It seems to this writer that such anenvironment is only developed under the cloistered auspices of an experimental college, where the students, by residing on campus, are shielded from many of the environmental constraining conditions that are adverse to this type of experimentation.

Up to this point, the reader may have developed the notion that skill development and training would have only a small part of play in such an experiment. Nothing could be further from the truth! Of equal importance for the success of the overall scheme is a well conceived plan for training people (i.e. the students) so that they will be able to perform certain tasks found to be essential for the continued development of our society. These

elements of training would be requirements, even to the point of being coercive. Skills that fall within the rubric of "societal musts" include certain vocational abilities, group cooperation, the various forms of communication, and child-rearing. Observed tendencies toward learning the skills of coercing or harming others must be suppressed and diverted - such skills would include destruction of self, others, and property.

Therefore we see the dilemma of establishing a special experimental institution aimed at fostering student development as its primary goal - students can develop positively and negatively. We must be prepared to establish boundaries to contain the destructive characteristics and at the same time aggressively encourage the emergence of positive - constructive characteristics. This requires continuous experimentation and evaluation, and will be accompanied by many mistakes. Good evaluation will identify these errors. The important thing is not how many mistakes were made during the process, but how did the poor-risk student develop in the final analysis? Did he become a happier and more socially useful person? If that question can be answered with even a small "yes", then it can be said that we have performed a small miracle. Shall we try for the miracle?

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CHAPTER 5

A GENERAL TECHNICIAN PROGRAM FOR SCHOOL ALIENATED YOUTH*

Introduction:

The urban disadvantaged youth of our times are confronted with social, economic, and employment problems which are considerably different from those experienced by the ghetto youth of past generations. Although the ghetto youth of today and a half century ago are alike in the respect that they originate from minority groups, the similarity seems to end there. During the first half of this century, the youngsters found in the urban slums came from families of European background; they were white-skinned, and to varying degrees were able to accept the belief that, with the right amount of self-effort and a few breaks, they could obtain a job and thereby achieve some degree of economic independence. Upon being initiated into adult American society via employment, they could then minimize many of their ethnic differences. The central fact which made this possible was that they were white. They could dress and take on many of the other life-styles of the majority group, thereby shrouding their ethnic differences from public view.

The characteristics of the job market have undergone great changes since the beginning of this century. In 1900, seventy-five percent of the nation's labor force was engaged as producers of goods. The majority of this segment of the labor force consisted of farmers, farm hands, and unskilled labor. "Human muscle" still had a significant role to play in the production of goods (1:20). From these facts, it can be implied that the proportionately greater number of skilled-unskilled jobs (as compared to today) provided the ghetto youngster of that time with a visible avenue to the world of work. It was possible, and indeed common, to enter into the work force with only eight or ten years of schooling, which was a surmountable educational barrier.

Many of the ghetto youth today are black, a fact which cannot be disguised by the mere adoption of the life-style of the majority group in society. This distinction has made it easy in the past

* Certain aspects of this chapter have been described in an article with the same title in Technical Education News (Vol. 28 No. 2 May/June, 1969), published by the McGraw-Hill Book Company and written by this author. Permission has been received to use the material in this chapter.

to identify them for the purpose of exercising sundry forms of discrimination from "the womb to the tomb". We are making some progress in moving away from such primitive treatment of fellow human beings, but there still remains a significant difference between today's disadvantaged youngster and his counterpart of several generations ago.

Added to the obstacle of being non-caucasian are the changes that have been going on in the world of work. Since 1947, the number of blue-collar workers have decreased from just under 13 million to 12 million, in spite of the fact that our index of industrial production has increased by almost ninety per cent during the same period. It should also be pointed out that 13 million was a substantially greater proportion of the entire population in 1947 than 12 million was in 1964 (the year in which figures were taken) because of the population increase during that interval. This paradoxical situation was accompanied by a doubling of the number of engineers and scientists (from .75 million to 1.5 million). The change in the nature of the work force from physical to cognitive activities has had profound implications for ghetto youth. Proportionately speaking, there are fewer jobs of the low skilled-unskilled variety available. Most of the jobs available today require considerable educational attainment beyond the eight or ten years demanded several generations ago. Drucker described the dilemma in this way (2:1258):

> Every group immigrating to the urban society during the past century or so has had to jump an educational gap. This gap, however, has become wider with every generation. Where the gap was only a few weeks of schooling when the Irish arrived in the 1840's from a background of total rural illiteracy, it has now become a matter of twelve to sixteen years of schooling. This distance is more than any one generation - regardless of skin color or its acceptance by the majority - can possibly jump in one or even two generations.

The "quick to train for" jobs of today are those jobs that are not considered anymore desirable by the ghetto group than the rest of the working force, primarily because they do not offer the ladder-type opportunities which would allow an individual to advance to the limitations of his own abilities. Mass-production work and the traditional crafts, the occupational area in which many blacks between World War I and post World War II were able to achieve economic stability, are destined to become sacrifices to the evolution going on in the work world.

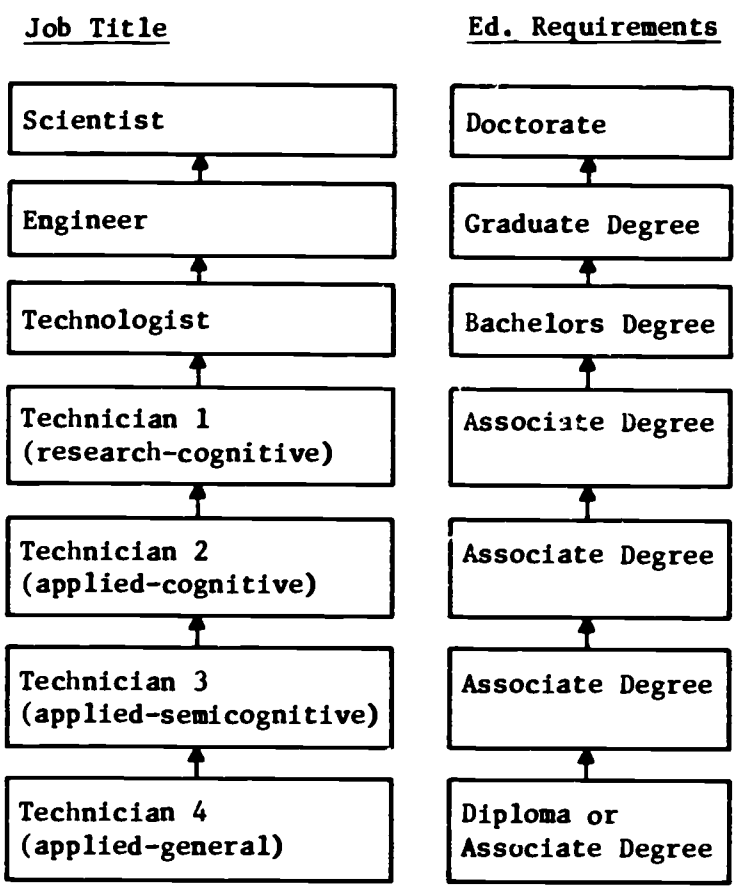
If the disadvantaged of the urban ghettos are to bridge the chasm between their present status of poverty and hopelessness and what they need to become happy and productive persons, ways must be found in which they can be prepared to enter the rapidly emerging knowledge based technologies. The traditional methods of education (vocational or liberal) are not the vehicles for achieving this purpose. New ways, perhaps even new institutions (3), are being called for. The program described in this Chapter, called the General Technician Program, is a modest attempt to move in this new direction.

The Problem:

As educators we have for the most part failed to find effective ways in which school alienated youth can be brought into the mainstream of the occupational world via education. In an attempt to move in that direction, this pilot curriculum has been designed. It has been assumed highly likely that, without an intervention of the type proposed in this paper, these young people will be destined to spend a major part of their working years being unemployed because of their educational and psychological disadvantages.

This program actively attempts to reduce the negative attitude toward work which many ghetto youth harbor. Furthermore, and of equal importance, this program is a knowledge based curriculum, and provides the student with a rich and broad exposure to technician-type experiences which can serve as a launching point into a more specialized course. The belief here is that exposing the student to several technician subject areas, as opposed to the traditional specialized one technician area treatment, will serve to better prepare him for the general functions of the technician. The practical experiences and knowledge to be given to each of the several technician areas covered in this curriculum will better enable the student to move from one job (probably because of it being phased out of existence) into another job with a minimum of retraining. Indications that "low academic" level technicians are needed by industry are cited in the literature (4,5,6,7).

Also of interest is that this program is geared to preparing youth to enter technician type jobs at the bottom rung of the ladder of technical occupations. See Figure 1 for a generalized model of the technical occupations ladder.



The Technical Occupations Ladder: General Model

Figure 1

The fact that it is identifiable as a rung on a ladder means that the program prepares people to enter open-ended positions rather than dead-end job situations. This should have a substantial impact on attracting school alienated youngsters into the program.

Objectives:

The underlying philosophy of this program is to serve the needs of non-academically oriented post-high age youngsters, i.e. the school alienated youngster. It should be noted that the pro-

gram is in theoretical agreement with the "open door" philosophy to which many of the nation's community colleges claim allegiance. Student recruitment is one of the most critical aspects of this program. The youth being sought for this curriculum is not the one who would normally seek out the community college as a vehicle for self-improvement, since he most likely feels that he lacks the qualifications to get in. Therefore, it is imperative that an aggressive recruitment campaign be planned.

This is proposed to be a pilot or experimental project in which one of the overall purposes is to identify, test, refine, and establish a general technician program for educationally disadvantaged youth. The major objectives are:

1. To develop curriculum approaches, techniques, and materials that will be found to be most suitable for this type of student and program.

2. To establish a sequence of cooperative work-practicums with local business and industries in which the major focus will be on the socio-occupational development of the student. This aspect of the program can be best described as a work practicum, since its major goal is to provide the student with the opportunity to "practice" working under carefully selected and monitored conditions. Notice that the stress is placed on the acquisition of positive work experiences with no overt attempt to associate the work activities with the occupational content of the program. The provision of a successful work experience would hopefully provide the student with the basis to develop positive attitudes toward work and also in his relationships with others and the world of work.

Three other outcomes of the work practicum are:

a. To provide an additional basis for making the classroom activities more relevant to the student.

b. To provide him with a limited income while he is going to college.*

*The assumption made is that those business and industrial concerns that agree to participate in this kind of program would be willing to compensate the work practicum students at the prevailing wage for the work performed. This would greatly reduce the onus of "subsidizing" students.

c. To provide him with practical on-the-job experiences which will tend to encourage him to develop an interest in a specific occupation.

The work practicum should be conducted with academic credit.*

3. To establish a sequence of relevant technician experiences which would provide the students with a broad base from which they can later specialize (either in another two-year college program or with on-the-job training).

4. To improve ways of recruiting school alienated youngsters for two-year college occupational programs.

5. To develop a two-pronged system of evaluation:

   a. Short term: A continuing evaluation process in which the progress of the student is under continuous scrutiny during the entire time he is enrolled.

   b. Long term: A longitudinal evaluation process in which the progress of the student is watched on a long term basis in terms of continued employment, additional training or education, observations of employers, and periodic interview of the graduate.

6. To write a curriculum guide based on the various materials and approaches developed and the experiences acquired during the conduct of the pilot program. Hopefully, the curriculum developed in this manner could serve as a model for continuing programs for disadvantaged youth in that institution, with the understanding that it is subject to modifications every year.

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* It is reasonable to assume that one important basis for giving credit for a course is the extent to which the student learned some new knowledge. In this case the learning deals with the art of working. The focal point of the evaluation process would be the Work Practicum Coordinator. The conversion of time to credits can be done in the same way laboratory type courses are rated. Example: A work practicum of 15 hours per week for a semester would be a three semester hour course.

It is deemed vital that the classroom-laboratory activities, both those associated with the basic or general education portion of the curriculum as well as the occupational oriented activities, be of a truly relevant-to-the student nature. The basic education (called general education in the program outline*) should be heavily dependent upon oral activities and essentially take on a non-book and non-writing characteristic. It will hopefully deal with those aspects of communications, humanities, social sciences and fine arts that most immediately tie in with the present lives and problems of these students. In short, the general education will hopefully become a sequence of inter-disciplinary studies that will have very little, if any, reliance on the student's ability to read and write at the start of the program. This approach will hopefully serve as a concrete demonstration to the student that reading and writing does have real value for him as he sees its relationship to understanding himself and his environment. Motivation to learn to read and write will be developed in this way. As it is evident that the student has been sufficiently motivated, reading and writing will be brought into his studies in an integrated manner.

Design of the Initial Program:

The idea for a General Technician Program developed during the 1966-67 academic year when this writer was participating in the "Design of Urban Education" project in Newark, New Jersey (8). At that time, there was some discussion about initiating a plan for a post-secondary demonstration program. Step one in carrying out this charge was to meet with key individuals of the Newark School System, the New Jersey State Employment Service, and several industrial firms. Three programs were ultimately designed, one of which was the General Technician Program.

It took little time to establish the fact that many of the post-high school age youngsters from the ghetto areas of Newark were unemployed, and had no marketable skills with which they could use for entry into the labor force. The overall purpose of the project was to provide one or more programs in post-secondary education for these youths that would give them the educational foundation required to enter into productive and happy lives.

Very early in this study, it was recognized that bringing school alienated youth into the mainstream of the occupational world was no small task. Because of the differences between these

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* The program outline is found at the end of the Chapter.

youngsters and the more conventional youth, we arrived at the belief that the traditional academic and occupational programs offered by many community colleges would not be good enough, i.e., they would not be relevant for non-middle class youngsters.

The next phase of the endeavor was to identify the salient characteristics of the youth to be served. After some consideration, it was felt that the program should be designed for post-high school age youth who:

a) had relatively low academic standing in high school;
b) had taken a general-type curriculum while in high school;
c) may or may not have graduated from high school;
d) had few if any, skills, that were immediately marketable in the world of work;
e) had generally negative attitudes toward work because of the multitude of other disadvantages experienced by them.

As simple as these characteristics may seem to the reader, it took some time to accept them as the program's student model. The original hypotheses dealing with incoming student characteristics was fed back and forth between the originator and key individuals until the above became the resultant acceptable student model.*

Having identified the student in the broadest sense, the next step was to identify curricular activities that would help to bridge the gap between his present circumstances and a productive way of life. It was felt that these activities should be selected on the basis of developing one or more of the following:

a) more positive attitudes and accurate knowledge of himself and his society.
b) more positive attitudes toward work
c) fundamental broad-based knowledge needed for entry in the society.

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* Perhaps the major difficulty in accepting them was the tendency (out of habit) to seek out students with the more traditional characteristics. This required some individuals to "jolt" themselves out of viewing it as a post-secondary program in the conventional vein, and to see it as an experimental curriculum whose details would evolve as the program progressed.

The next step was to seek out those topics which would introduce the student to the fundamental knowledge needed for entry into the world of work. Several key individuals in industry assisted in this endeavor (9). After a series of meetings, a total of eight occupational oriented topics were suggested as being of value in this type of program. These eight topics, which make the program an amalgam of technician related knowledge areas, are: Machine Shop Practice, Selected Topics in Chemistry, Basic Electricity, Basic Electronic Instrumentation, Vacuum Technology, Cryogenics, Selected Topics in Mathematics, and Selected Topics in Physics. Addendum I contains the more detailed subtopics (10). An inspection of the subtopics illustrates the fact that the materials selected deal with practical knowledges and aspects of each topic, and studiously avoids the more abstract treatment of those subjects. The contention was that these clusters of knowledge could be learned by disadvantaged youth if the presentation is rich in "show-how" kinds of instruction.

A questionnaire was designed next and was sent to a group of businesses and industries in greater Newark (11).

The nature of the questionnaire was such that the respondents were asked to assign a value to each of the curriculum areas just described, in terms of the kind of technician needed by them. The responses of those who stated they would hire such a technician point to high values assigned to six of the eight topics (Machine Shop Practice, Selected Topics in Chemistry, Basic Electricity, Basic Electronics Instrumentation, Selected Topics in Mathematics, and Selected Topics in Physics). Relative low values were assigned to Vacuum Technology and Cryogenics.

A total of 25 industrial firms in the greater Newark area indicated an interest in hiring the graduates of this program. Furthermore, these same firms stated they would be willing to engage in cooperative work programs for about fifty students. Twenty-five other industries, who indicated they did not have positions requiring this type of technician, expressed a willingness to enter into work practicums for about forty students. Therefore, the survey showed that selected industries in greater Newark would be willing to place about 100 students in work practicums. This was considered very encouraging.

It was felt that the Newark survey was a good indicator of the acceptance of a general technician program by the industrial community. But it was also felt that a geographically more comprehensive survey of the topics to be included in the curriculum would be in order. So the questionnaire was revamped and expanded

to include an opportunity for the respondent to react to the Work Practicum and General Education aspects of the program. The new questionnaire was first sent to a pretest group; and after some small revisions suggested by them, it was mailed to two hundred selected industries in the states of California, Oregon, Washington, and Arizona with a cover letter describing the intent of the survey (see Addendum II for a copy of the cover letter). There was a fifty-five percent return, with no second attempt made to encourage the non-respondents to fill out the survey and return it (12). The tabulated results of the West Coast survey are shown in Table I.

The technique used for translating the survey results into a curriculum outline was quite simple. The relative value placed on each topic by the group of respondents was one of the chief factors used in deciding upon the amount of time allocated in the program for that topic. There was considerable similarity between the responses of the Newark group and the West Coast group in that reduced values were given to Cryogenics and Vacuum Technology. The west coast respondents also assigned a low value to Chemistry. The west coast group, as can be seen from Table I, assigned the highest values to Machine Shop Practice, Mathematics, Work Practicum, and General Education. The curriculum outline finally arrived at is shown in Table II.

Adapting the Designed Program to Specific Colleges:

The curriculum arrived at by the translation of the findings obtained from the two surveys was the result of a relatively abstract process. That is, it was a theoretical analysis to ascertain the broad areas that would be relevant in such a curriculum. The findings served as a basis for the design of programs for specific colleges, where other institutional and regional factors would enter into the determination of the final program content for a particular college. Two institutions have, at the time of this writing, elected to give serious consideration to the implementation of the program, with each of them making modifications that were more consistent with unique characteristics of their institution.

A. The Maui Community College Program

The Maui (Hawaii) Community College had several trade and industrial type programs that were no longer attracting students. This set the stage for an inquiry into the situation. These

Table 1

TABULATED RESULTS: GENERAL TECHNICIAN QUESTIONNAIRE

Assigned Value:	Unrelated or No Value		Of Limited Value		Important		Very Essential		No Response		Total	
Questions	N	%	N	%	N	%	N	%	N	%	N	%
1	2	(1.8)	13	(11.8)	31	(28.2)	63	(57.3)	1	(.9)	110	(100.0)
2	11	(10.0)	45	(40.9)	40	(36.4)	12	(10.9)	2	(1.8)	110	(100.0)
3	7	(6.4)	23	(20.9)	36	(32.7)	42	(38.2)	2	(1.8)	110	(100.0)
4	10	(9.1)	15	(13.6)	32	(29.1)	47	(42.7)	6	(5.5)	110	(100.0)
5	23	(20.9)	49	(44.6)	23	(20.9)	11	(10.0)	4	(3.6)	110	(100.0)
6	19	(17.3)	51	(46.4)	28	(25.4)	9	(8.2)	3	(2.7)	110	(100.0)
7	0	(0)	3	(2.7)	20	(18.2)	85	(77.3)	2	(1.8)	110	(100.0)
8	8	(7.3)	23	(20.9)	36	(32.7)	39	(35.5)	4	(3.6)	110	(100.0)
9	5	(4.6)	15	(13.6)	33	(30.0)	55	(50.0)	2	(1.8)	110	(100.0)
10	4	(3.6)	13	(11.8)	54	(49.2)	36	(32.7)	3	(2.7)	110	(100.0)

N = Number of respondents.

Questions:
1. Machine Shop Practice
2. Selected Topics in Chemistry
3. Basic Electricity
4. Basic Electronics
5. Vacuum Technology
6. Cryogenics
7. Mathematics
8. Selected Topics in Physics
9. Technician Work Practicum
10. General Education

Table II

GENERAL TECHNICIAN PROGRAM (OUTLINE)

First Year:

Semester I:	Semester Hours	
Machine Shop Practice	3	
Selected Topics in Electricity	3	
General Education	5	
Work Practicum*	3	15
Semester II:		
Selected Topics in Electronics Instrumentation	3	
Selected Topics in Mathematics	3	
General Education	6	
Work Practicum*	3	15

Second Year:

Semester III		
Selected Topics in Physics	2	
Selected Topics in Cryogenics	1	
Selected Topics in Mathematics	3	
General Education	6	
Work Practicum*	3	15
Semester IV		
Selected Topics in Chemistry	2	
Selected Topics in Vacuum Technology	1	
Selected Topics in Mathematics	3	
General Education	6	
Work Practicum*	3	15
TOTAL		60 SM

* The Work Practicum would consist of about 15 work hours per week. The student would be paid by his employer at the prevailing rates.

programs were of ancient vintage and had undergone relatively little modification over a long period of time. For a time there was some debate as to the basic reasons behind the decreased attraction these programs held for the students in that island community. After some thought, it was felt that two of the basic reasons were believed to be: 1. Much of the content in the speciality portion of each program was not relevant to the present needs of the community and the state. 2. The programs were dead-end; there was no clear indication of any ladder-type opportunities for the students in these programs.

The instructors of these programs, upon finding these reasons feasible were then ready to consider ways to solving the enrollment problem. In order to facilitate this task, they decided to set aside a period of time each week for one semester.* Early in these sessions the faculty considered the General Technician Program described in the preceding paragraphs and a series of dialogues developed. It is interesting to note that the dialogues, which first involved only the faculty members teaching in the old curriculums, stirred considerable interest among other faculty members. Within a few months, the matter was brought before the curriculum committee of the college in the form of a modification of the General Technician Program. The modified curriculum, which was more in harmony with the characteristics of the college and that island community, was labeled as the Trade and Industrial Technology Program. Figure II depicts this program in the form of a flow diagram.

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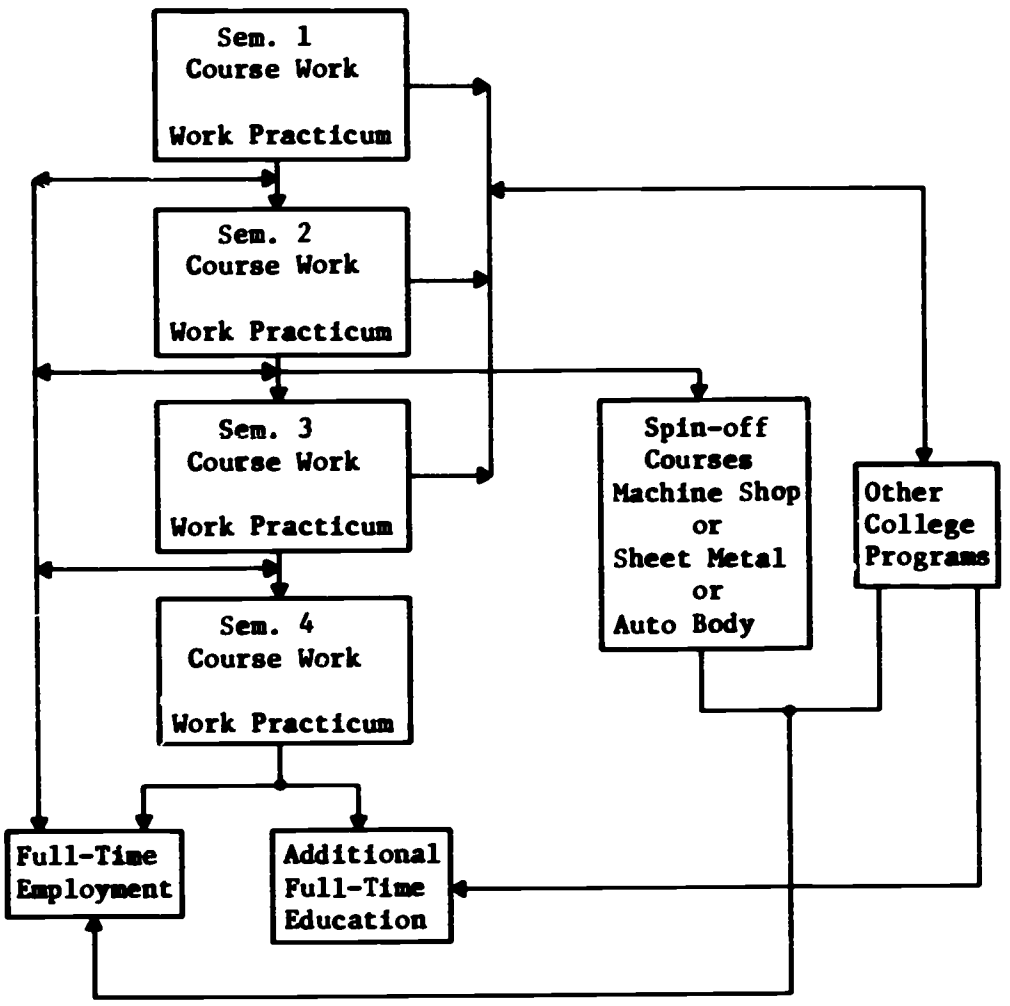
* This was accomplished by conducting a weekly seminar called "curriculum problems" by this writer during the fall semester, 1968. During the series of sessions, the faculty members evolved from original feelings of defensiveness of their present programs to a keen desire to inaugurate a new program. They designed a new program that was an amalgam of the good features of the present programs plus some new topics. Their enthusiasm spread to some other faculty members and it was warmly endorsed by the curriculum committee of the college. Worthy of note is that these faculty members associated with the older vocational programs went so far as to express a willingness to discontinue the old programs for a period of two years while the new program was being tried.

TRADE AND INDUSTRIAL TECHNOLOGY PROGRAM: MAUI COMMUNITY COLLEGE

FLOW DIAGRAM

FIGURE 2



In addition to the objectives stated earlier in this chapter, The Trade and Industrial Technology Program had two objectives that were directly related to the Hawaiian situation. They were:

1. The two-year sequency of shop and laboratory experience might be considered for incorporation into the industrial arts teacher training program at the University of Hawaii. Students who enter the program for this purpose would be expected to enroll in transfer-type courses for the general education portion of their curriculum. This aspect of the program is still being studied at the time of this writing.

2. The curriculum is to have entry points at the beginning of each and every semester for those students who elect to leave another curriculum in the college. It would also be possible for youth to go out to work on a full time basis for a semester and then reenter the program. The possibility of easy entrance and exiting has been enhanced by the careful design of the occupational courses such that a sequential or lock-step arrangement has been avoided. The transfer of students from other college curriculums to the Trade and Industrial Technology Program would be actively encouraged by the faculty. In keeping with this open-endedness and flexibility, the faculty members involved in its design felt that the general education portion of the program should also be nonsequential (non lock-step) as much as possible.

The curriculum outline adopted by the college is shown in Table 3.

TABLE 3

MAUI COMMUNITY COLLEGE
TRADE AND INDUSTRIAL TECHNOLOGY

F I R S T Y E A R

Fall Semester	SH	Spring Semester	SH
Technical Drawing	3	Welding Practice	3
Machine Shop Practice	3	Sheet Metal Fundamentals	3
Work Practicum	3	Work Practicum	3
Communications	3	Communications	3
Math 21	3	Social Science 51	2
	15	Electives	2-3
			16-17

S E C O N D Y E A R

Auto Sheet Metal	3	Engine Fundamentals	3
Practical Electricity	3	Construction Skills	3
Work Practicum	3	Work Practicum	3
Physics 41	3	Physics 42	3
Humanities	2-3	Social Science	2-3
Elective	3	Orient. to Employment	1
	17		15-16

TOTAL 63 - 65 S.H.

B. State Technical Instiute at Memphis

The State Technical Institute at Memphis (Tennessee) also gave favorable consideration to the basic concepts of the General Technician Program and came up with a modification that they called an "Industrial Technology" Program. The outline of this curriculum is shown in Table 4. The Memphis model is designed to serve youth with disadvantaged backgrounds and appears to have a truly openended approach to the conduct of the course work. Anyone who comes to class and attempts to participate will succeed within his own framework, therefore there will be no failures in the traditional sense. The student is to be brought as far along as is possible on the time allotted, with each student having its own starting point. When the instructor feels that a student has progressed to the point where he is close to where the more traditional students would be upon completion of the course, he would be given a test of achievement. This test, in conjunction with the instructor's observation of the student, could be used as the basis in determining whether that course should count toward an associate degree. Those students who don't come up to this level are simply given a "pass" grade. The work-practicum could also be conducted as a "pass" situation, based on the evaluation of the student in the work-practicum by the Coordinator. The approach just described calls for a substantial amount of individual student attention, which necessitates small classes. The State Technical Institute at Memphis is considering limiting enrollment in their experimental program to twenty-five students.

Conclusions:

The project which resulted in the design of a General Technician Program succeeded in:

1. Establishing a broad student model;
2. Establishing of objectives consistent with the student model;
3. Testing the originally selected topics against the opinions of selected industrialists from New Jersey and the West Coast;
4. Translating the tested topics into a curricular model from which specific programs could be designed.

TABLE 4

STATE TECHNICAL INSTITUTE AT MEMPHIS

INDUSTRIAL TECHNOLOGY

First Quarter	QH
Ma 14 Mathematics	4
En 24 Reading & Study Improvement	4
Re 12 Technology Orientation	2
IT 12 Shop Practices	2
WP 10 Work Co-op	4

Second Quarter	Fi
MA 24 Mathematics	4
Ph 14 Physics	4
Me104 Engineering Drawing I or	
Dp104 DP Machines	4
WP 20 Work co-op	4

Third Quarter	
Ma 114 Algebra & Trig. I	4
Ph 24 Physics	4
Technical Elective	3-5
WP 30 Work Co-op	4

Fourth Quarter	QH
Ma 124 Algebra & Trig I	4
En 14 Grammar & Comp.	4
Technical Elective	3-5
WP 40 Work Co-op	4

Fifth Quarter	
En 44 Tech. Communications	4
Social Studies Elective	4
Technical Elective	3-5
WP 50 Work Co-op	4

Sixth Quarter	
Social Studies Elective	4
Technical Elective	3-5
Technical Elective	3-5
WP 60 Work Co-op	4

Social Studies Electives

Sc 204 Human Relations
Sc 214 Economics
Sc 224 American Government
Sc 234 Management
Sc 254 Logic

Having done this, the second phase of the endeavor was to find one or more institutions that would be willing to conduct such a program on an exemplary or experimental basis. At this writing, two colleges have expressed such a desire and their overall plans for the implementation of the program are described. Hopefully it will serve as a launching point for more colleges to search for their way to better serve school-alienated youngsters.

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3. The thought of establishing new institutions for the education of the urban disadvantaged has been considered by several individuals concerned with the long series of failures encountered in attempting to educate this group. A major advantage of founding new institutions for this specific purpose is that it would begin with no old traditions to overcome and would probably attract faculty who would be deeply committed to urban education. This writer, in describing the General Technician Program to several community college faculties and to groups of occupational educators was quickly made aware of the concern of faculty members about the academic level and other aspects of the curriculum that were not directly relevant to the problems of the urban poor.

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7. Bent, Ralph D. "Technicians in the Electronics and Aerospace Industries." An article in Technical Education News (March 1965). New York: McGraw-Hill Book Company, Inc. 1965.

8. Rutgers-Newark Project: Design for Urban Education. Director of the project is Dr. Maurie Hillson, Professor of Education at the Graduate School of Education at Rutgers University.

9. Several of the key persons related to the employment and training of technicians at the David Sarnoff Research Laboratories in Princeton, New Jersey were most helpful in the initial selection of topics.

10. The questionnaire in Addendum I is the final revised version which was sent to a larger group of industrialists on the west coast during the spring of 1968.

11. The cost of duplicating and mailing was assumed by the Newark office of the New Jersey State Employment Service during the winter months of 1966-67.

12. The Rutgers Research Council provided the funds for the preparation, duplicating, and mailing of this questionnaire. Tabulation of the results was done at the University of Hawaii.

A D D E N D A

SURVEY FOR GENERAL TECHNICIAN CURRICULUM

Name of Respondent:_____Educator_____Industrialist_____

Position Title _____

Address of Respondent:_____(Firm or College)

_____(Street)_____(City,State)

This questionnaire describes the content of ten (10) areas which are being considered for the General Technician Curriculum, which would be a two-year community-junior college program. Would you indicate the value of the material in each of the indicated areas in terms of the needs of the general technician as described in the accompanying letter? The scale of values are as follows:

3	very essential	1	of limited value
2	important	0	unrelated or no value

Use "X" to indicate the value you wish to assign to each topic.

3__2__1__0__ (1) MACHINE SHOP PRACTICE

Operating instructions for the drill, lathe, bandsaw, grinder, and torch. Techniques for cutting various types of metal. The use of associated measuring instruments (such as the micrometer, caliper, scales). Use of the bending brake, sander, sheer. Ability to use both metric (cgs and mks) and english units. To know the precautions to be taken when using the machines listed above.

3__2__1__0__ (2) SELECTED TOPICS IN CHEMISTRY

A general knowledge of acids, solvents and alkali bases. The major emphasis will be on precautions and techniques for handling these materials. Some analysis of Vapors. Use of analytical balances, microscopes.

3__2__1__0__ (3) BASIC ELECTRICITY

A practical course on the fundamentals of direct current and alternating current. Some general transformer work (at least to distinguish between step-up and step-down transformers).

3__2__1__0__ (4) BASIC ELECTRONICS:

Heavy emphasis on the use of certain basic instruments, including: Oscilloscopes, Voltmeters, Ammeters, Ohmmeters, X-y recorders, Bridges (for circuit balancing), Frequency Meters (oscillators). Special attention given to spectrum analysis, including a good treatment of frequency and wavelength. Treatment of integrated circuits (what they are) and transistors (how they work). No work on amplifiers will be included.

3__2__1__0__ (5) VACUUM TECHNOLOGY:

Knowledge on: How to operate the mechanical pump, diffusion pump, deposition (the process of evaporation of metals). Familarity with the following types of heating: electron beam, resistance and inductive. Knowledge of cold traps, various sub-strates (such as ceramics, glasses). The reading and measurement of vacuums. Know how to measure deposits of metals.

3__2__1__0__ (6) CRYOGENICS:

The characteristics of temperature. Fundamentals of heat flow down-hill. Knowledge of the temperature scales and conversions between them. Heavy emphasis on demonstration and laboratory performance- a practical approach throughout.

3__2__1__0__ (7) MATHEMATICS:

Review of the fundamentals of arithmetic (addition, subtraction, multiplication, division, fractions, decimals, percentages). Introduction and review of general mathematics, simple linear equations, algebraic processes, the slide rule, elementary topics in geometry and trigonometry. Scientific notation will be stressed in conjunction with the use of the slide rule.

All topics in mathematics will be related to the technical subjects being taught at the same time or that will follow shortly. The related approach to the mathematics, with heavy emphasis on practical applications will be stressed.

3__2__1__0__ (8) SELECTED TOPICS IN PHYSICS:

Units of measurement (including mks.,dgs,fps, frequency, wavelengths). Principles of current flow (from which will come the concepts of current flow in metals, solutions, and then semiconductors). The concepts of solids, liquids, and gases. Some practical theory on how the vacuum pump works. Some practical principles of magnetism and electromagnetism. A practical treatment of temperature measurements and the relationship between temperature and the behavior of certain materials. Light (ultra-violet and infra-red) principles. A few selected concepts on photosensitivity.

3__2__1__0__ (9) TECHNICIAN WORK PRACTICUM

Work experience in business and industries. The practicum would be offered for the entire four semesters. Each student would be limited to not more than twenty contact work hours per week. They would be payed by the employer and be given academic credit for the experience. The major objective of the practicum would be to provide the student with a varied work experience over the two-year period (he would be assigned a new

work practicum each semester). There will be no serious attempt to match work experiences with the curriculum.

3__2__1__0__ (10) GENERAL EDUCATION:

A special designed sequence of interdisciplinary studies. Selected topics to be included are English (oral, written, listening); Social Sciences (history, sociology, psychology, antropology, economics); Humanities, Fine Arts. These studies will be oriented around the topics relevant to the student of today.

(11) COMMENTS:

This space is provided so that you may make comments about this proposed program, including other topics that you think should be added.

ADDENDUM II

June 21, 1968

Head of Technician Personnel

Dear Sir:

Attached is a series of questions relating to the possible topics to be considered for inclusion in a new type of community-junior college two-year occupational program. The new curriculum being investigated has been given the title of General Technician Program by this writer.

One of the chief basis for considering a General Technical curriculum is the fact that the role of certain technicians in industry undergo frequent changes. In the past, industry would employ a heavily specialized technician only to have to retrain him to function in an area outside his immediate specialty. In other instances, industry would employ individuals as general purpose technicians, training them for specific jobs as the need emerged. The curriculum being studied here will hopefully minimize this problem to the extent that the graduate of the General Technician Program will be exposed to basic knowledge in about ten relevant areas (which are described in the questionnaire). In this way, the on-the-job retraining task would become a shorter and less costly process for the industry.

As the person responsible for the training and/or employment of technicians in your place of employment, would you assign a value to each of the following topics for possible inclusion in a curriculum for general purpose technicians?

The compiled results of this study will be widely circulated, and a suggested curriculum may grow out of this effort. Thank you for your invaluable cooperation.

Sincerely,

CHAPTER 6

THE ROLE OF THE UNIVERSITY IN POST-SECONDARY TECHNICAL EDUCATION*

Introduction:

This chapter deals with several of the more important roles being assumed by universities in the promotion and improvement of community college technical education. It is pointed out that two-year college technical education, once almost exclusively found in the technical institutes, is now moving into the public community-junior college in strength. The new mix of technical education and the community college is creating a cluster of effects which are changing certain characteristics of both the community college and technical education. For technical education, the community college has brought the possibility of a panoply of general education courses, aimed at enriching the out-of-work life of the student. For the community college, technical education has brought the possibility of greater diversity in its student body, hopefully to the enrichment of all.

Associated with this recent movement in technical education are those roles being assumed by the universities. This chapter delves briefly into six of them; they are: (1) Teacher Education, (2) Research, (3) Evaluation, (4) Design and Development of New Curriculums, (5) Updating Existing Curriculums, (6) Design and Development of Technical Education Programs for Urban Youth.

The Setting:

The involvement of universities in various segments of American society has steadily increased in the past century. The inauguration of the Morrill Act of 1862 was one of the earlier efforts to encourage the development of institutions of higher learning which would lend their expertise to the preparation of people for occupations other than theology, law, and medicine. That act provided the initial impetus for higher education to give serious attention to the practical arts and world of work. Once

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* This chapter is a modification of a paper with the same title presented by this writer at the Annual Meeting of the American Society for Engineering Education at the University of California at Los Angeles in June, 1968. The original paper was published in the April (1969) issue of the Junior College Journal (Washington: American Association of Junior Colleges) under the same title "Six Roles of the University."

[illegible] faculty began to engage in various activities that were not of a traditional academic nature. This trend has progressed to the point where various institutions and agencies are continuously knocking on the doors of the universities asking for their help in finding solutions to their many and diverse problems. The reaction to these demands varies from one university to another, but almost every university has become involved with its larger community in attempts to find solutions to problems of its region and state.

Now that technical education has moved into the public community college area, certain technical education leaders have sought the involvement of the universities. Community college technical education, besides having the problems associated with technical institute technical education, has additional problems associated with community college type education. It is felt by many that some of these problems can be attacked most effectively if the technical educators can find support and assistance from the universities. Some of the roles of the modern university that relate to the interests of community college technical educators deal with: (a) teacher education, (b) research, (c) evaluation, (d) design and development of new curriculums, (e) updating existing curriculums, (f) assistance in the establishment of technical education programs for ghetto youth. The position taken here is that it is from these six roles that the university can be of greatest service to technical education in the community college. Let us examine them in greater detail.

Teacher Education:

In spite of the fact that teaching has been a recognized occupation and profession for hundreds of years, evidence shows that virtually nothing has been done toward developing a science of teacher education. Moss (1:26) described that dilemma in this way:

> We need a system of verified principles which will permit us to understand and control the teacher education process. At present we are still operating programs primarily on the basis of tradition, 'convention', wisdom, and personal experience. This does not imply that current teacher education practices are necessarily bad, only that we really don't know their worth, and that we cannot be reasonably confident about judging suggested means for improving present practices.

It is here suggested that some of the very complex and persistent problems associated with community college technical education teacher preparation must be submitted to a long-range systematic research effort conducted by the universities. Research models are needed which will provide direction to research efforts in the area of technical teacher education.

A suggested approach is to plan for the conduct of studies which:

1. Relate to the objectives of technical teacher preparation programs.
2. Deal with the human resources from which potential technical teachers can be drawn.
3. Deal with the varieties of technical teacher education programs that could be devised.
4. Aim at developing effective methods for the recruitment of the most suitable individuals into technical teacher preparation programs.
5. Are designed to evaluate the educational experiences being provided by ongoing technical teacher preparation programs.

Miller (2:30) proposed a systems approach to designing programs in technical teacher education. Based on that model, he proceeded to analyze several aspects of technical teacher preparation programs, including the following: (1) Role of the technical teacher, (2) Selection and recruitment of technical teachers, (3) Technical teacher training programs, (4) Evaluation of technical teachers.

The fact that there now is some talk about research models is a welcomed indication that technical educators are becoming more seriously concerned about developing long range models for the study of the many processes and activities involved with technical teacher preparation programs. As stated before, the use of such models as a framework from which various research efforts may embark, can hopefully result in some perceptable movement toward making a science out of technical teacher preparation. The role of the universities is clear here, they should spearhead this improvement movement and carry on the leadership needed in the overall research and training effort.

Roney (3) recently cited the need for the establishment of relevant professional education for administrators dealing with technical education programs, inservice education for employed technical professors, and preservice education for future technical

education teachers. There has been some progress in all of these directions, but much more needs to be done. The Purdue plan for the preparation of technical teachers, as described by Arnold (4:9-11), is an excellent example of an attempt to meet the need for more technical teachers. The Purdue curriculum is a third and fourth year program which draws its input from graduates of associate-degree technical programs. Therefore, it is seen that the technical programs of the two-year colleges, in addition to providing technicians for the world of work, is increasingly being looked to as an important source of potential technical teachers. One of the most innovative aspects of this program is the cooperative internship - the device through which the potential teacher may obtain a one-year work experience in his area of specialty and also receive academic credit for it. Other technical teacher programs, which look to the graduate of two-year college technology programs for their inputs, are being planned in several universities.

It would appear that this is a hopeful beginning of getting away from those stultifying elements of traditionalism that have blocked real progress in the matter of recruiting, training, and modernizing technical teachers. Some leaders in technical education are now prepared to question the real relevancy of requiring the technical teacher to have a first degree in engineering. Also overdue for examination is the requirement that the technical teacher have a large number of years of industrial experience to his credit. It has yet to be proven that engineers are the best technical teachers (5). Also unproven is that a long experience in industry is going to assure us that we are hiring either a good or an up-to-date instructor (6).

One of the few studies that delved into the characteristics of those technical education teachers that were considered successful by their administrators was conducted by Storm (7:7). Two of his findings, which relate to the kinds of backgrounds commonly found in those technical teachers that were considered to be successful were as follows (7:7):

> Technical instructors who enter teaching from a background of technician work in industry are generally considered more successful than those who enter with a background in engineering.
>
> and
>
> More high-rated instructors possess advanced degrees in education than lower rated instructors.

It seems that more studies of this nature should be conducted by universities, so as to further determine the relevancy of an engineering and other types of educational background to effective teaching in the technican area. Furthermore, universities should seek to become more involved in technician teacher preparation programs which have a well conceived approach to evaluation. This evaluation plan, not evident in any program seen by this writer, should be built in as an integral part of the program, but at the same time be financially independent of it. In this way, it would take on the characteristics of research and inquiry and not simply become a mechanism for the collection of data. The evaluation effort should begin with identification of potential technical teachers, continue on with the evaluation of the program and follow through with an evaluation of the graduate for at least the first five years of his teaching career. The type of teacher produced by these programs should also be compared, in tangible ways, with technical teachers that have other backgrounds in terms of education, training and experience. One or two carefully designed and carried out longitudinal studies of this type would be a major step toward knocking down the remaining walls of traditionalism that have been plaguing technical education almost since its inception. The technical teachers preparation effort is probably one of the most important roles the universities can play in the betterment of two-year college technical education.

Research:

A list of suggestions for research and evelopment activities in technical education teacher preparation was compiled by Miller (2:23-32). These suggestions were submitted by a number of the nation's foremost technical education researchers, teacher educators and administrators who served as consultants on the Miller project. The recommendations he obtained fell into a total of 24 categories. Koschler developed a modest list of research needs in technical education programs (8:19), and it covered 14 areas. Other lists of research needs and priorities are in existence. But what are the most pressing areas of inquiries in which research should first turn? The answer to the question would invariably depend at least to some extent upon the interests and biases of the person responding to it. Therefore, the following statements obviously reflects this writer's perception of those topics believed to be of greater importance.

Broadly speaking, a major research thrust should be aimed at learning more about technician type students and their environments. There has been a number of studies in student and school

environmental characteristics (9:690-730) (10:811-845) (11:536-562), but relatively little of this past effort is directly applicable to technician students in the two-year college and technical institute. One such study is presently in progress, which is entitled "A Comparison of Environmental Press and Selected Student Characteristics in a Community College and Technical Institute" (12). The population used in this research consists of students enrolled in four career curriculums in a large technical institute and a medium size community college (both public supported). The curriculums are Electrical Technology, Nursing, Business Administration and Secretarial Science. A total of about 900 students were involved in the beginning phase of this study. Phase one of this study included the administration of several instruments to each entering student in the four curriculums prior to attending their first class session (13). These established the basis for obtaining information in the initial part of the investigation before the students were subjected to the influence of the college environment. An interim follow-up has been conducted during the Spring of the following year (14) and the final administration of instruments was conducted during the Spring of their second year. The data obtained from this study will provide a basis for identification of those elements between certain student characteristics and institutional characteristics that appear most often in those students that have completed their programs. The results will hopefully also provide indications of those combined student and institutional characteristics which are most often found in students dropping out of their programs. If clear-cut trends, which are statistically valid and reliable, are identified by this study, it might serve as the launching point for a similar study conducted on a wider scale, both geographically and in other types of programs. Additional studies of this type, which attempt to find ways of matching students to programs and institutions are sorely needed. Although the two-year college is the arena for these studies, it is logical for the universities to assume the role of leadership in their design and conduct.

Evaluation:

Much more effort is needed in the area of evaluation. Evaluation in many instances has meant nothing more than directing inquiries into attrition rates and whether or not graduates of a program obtained a position in industry. The contention here is that the use of such devices, with the claim that they are satisfactory methods of program evaluation, is based on shortsightedness on the part of the technical educators. This writer

has learned of more than one case where the technical educators in certain programs took pride in the fact that less than half of the enrolling freshmen graduated from the course two years later. This represents a shameful waste of human resources. Certainly this calls for an attempt to devise a model of evaluation that would encompass all aspects of the program from student selection to long range follow-up, as shown in Figure 1.

The development of a model for the evaluation of community college technical education which is both continuous and longitudinal in nature can be a joint endeavor between the university and the two-year colleges. An additional role of the university in such an activity could include its overall administration, as well as the translation of the mass of accumulated data into suggestions and proposals that could lead to action - action that would produce changes which would improve the process of educating and preparing technicians for the future. Certain precautions must be noted however. The overall evaluation must be based on the goals of the technical educators and not on the sole goals of the evaluator(s). Stating this in another way, the evaluator's first task is to identify the goals of the technical educators. Then the evaluator(s) should focus on determining the extent to which the educational program is meeting the objectives of the technical educators (such as producing a competent and well adjusted technician) while at the same time determining whether any damaging changes are taking place (such as developing a dislike for a certain subject) during the process. The best evaluation of a curriculum is in terms of its effects upon the student, and this type of investigation must be longitudinal in nature.

Design and Development of New Curriculum:

The universities can also play a role in the design and development of new curriculums. Nelson (15) has indicated how special research centers could serve as agencies for the development of programs in emerging technologies. Perhaps these centers could enter into cooperative arrangements with universities and community colleges for the purpose of identifying new curriculums in community college technical education. There are several research centers whose major or total commitment is to the conduct of research in the field of Occupational Education (16).

Updating of Existing Curriculums:

The updating of existing curriculums is just as high on the research priority list as are studies dealing with the emergence of new programs. The universities can provide the thrust for

A MODEL FOR CONTINUOUS-LONGITUDINAL VALUATION OF COMMUNITY COLLEGE TECHNICAL EDUCATION

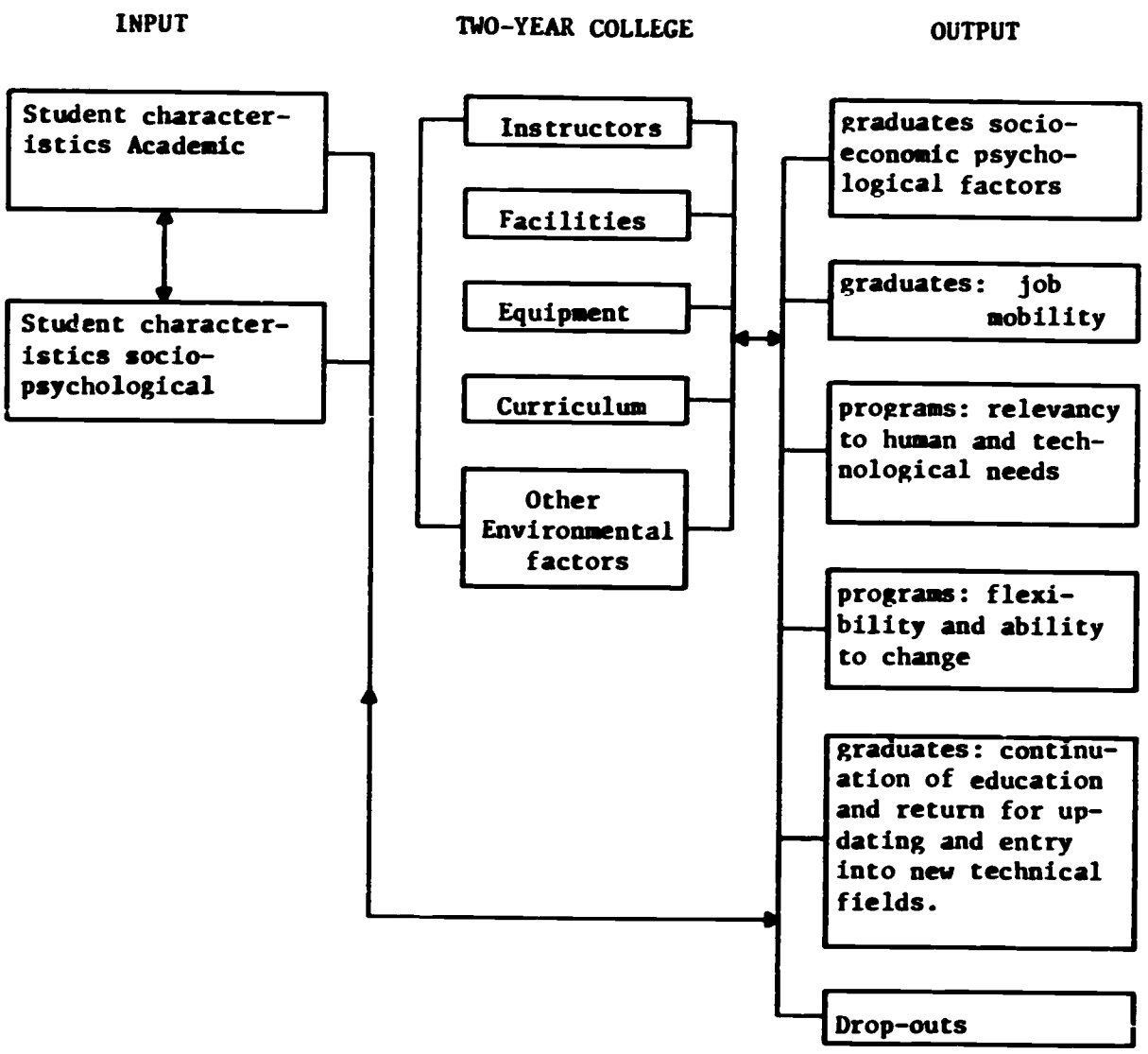


Figure 1

developing curriculum modernization studies. Such efforts would require cooperation between selected elements in industry, the community colleges and the universities. One model for updating two-year college technical programs is discussed in some detail in Chapter 7 (17). An illustration of this model is shown in Figure 2. This same model can also be utilized as an approach to the development of new curriculums, as discussed in Chapter 7.

Technical Education for Urban Youth:

The provision of technical education for urban youth presents a new set of problems that are superimposed on the already existing problems confronting technical educators. That is, the problems of preparing competent instructors, designing schemes for continuous and total evaluation, designing and updating curriculums so as to insure relevancy, and the recruitment of students are also present with this type of technical education. It can be said that these problems are even more difficult to solve when the goals of the programs are set for urban youth. Superimposed on the obstacles just stated are very severe problems dealing with the psychology of disadvantaged youth as it relates to society, education, training, and the world of work. Many intelligent technical educators are beginning to recognize the futility of expecting ghetto youth to "lift themselves by their bootstraps" into the world of middle class values. There are a few in the vanguard of technical education leadership who sense the need to design programs around the needs of individuals rather than around the needs of industry, particularly when dealing with disadvantaged youth.

This reversal in the approach to the design of technical education programs (i.e. starting with student needs rather than the needs of industry) calls for sweeping changes in all aspects of the effort - new kinds of instructors, increased diversity in the level of curriculums, the introduction of technician work practicums with academic credit, an entirely new approach to the supporting work in mathematics and sciences, and a new kind of general education that uses no books. New Programs should be moving in at least some of the directions indicated above. It is vital that a systematic, continuous and longitudinal evaluation system be incorporated as an integral part of each experimental or demonstration curriculum. Community college technical education program design and development should become more of a science and less an extension of unproven hunches and biases of a few educators. Again, the role of the university is clear - a cooperative agency in the design, conduct, and evaluation of these programs.

A MODEL FOR CONDUCTING STUDIES FOR
UPDATING EXISTING CURRICULUMS

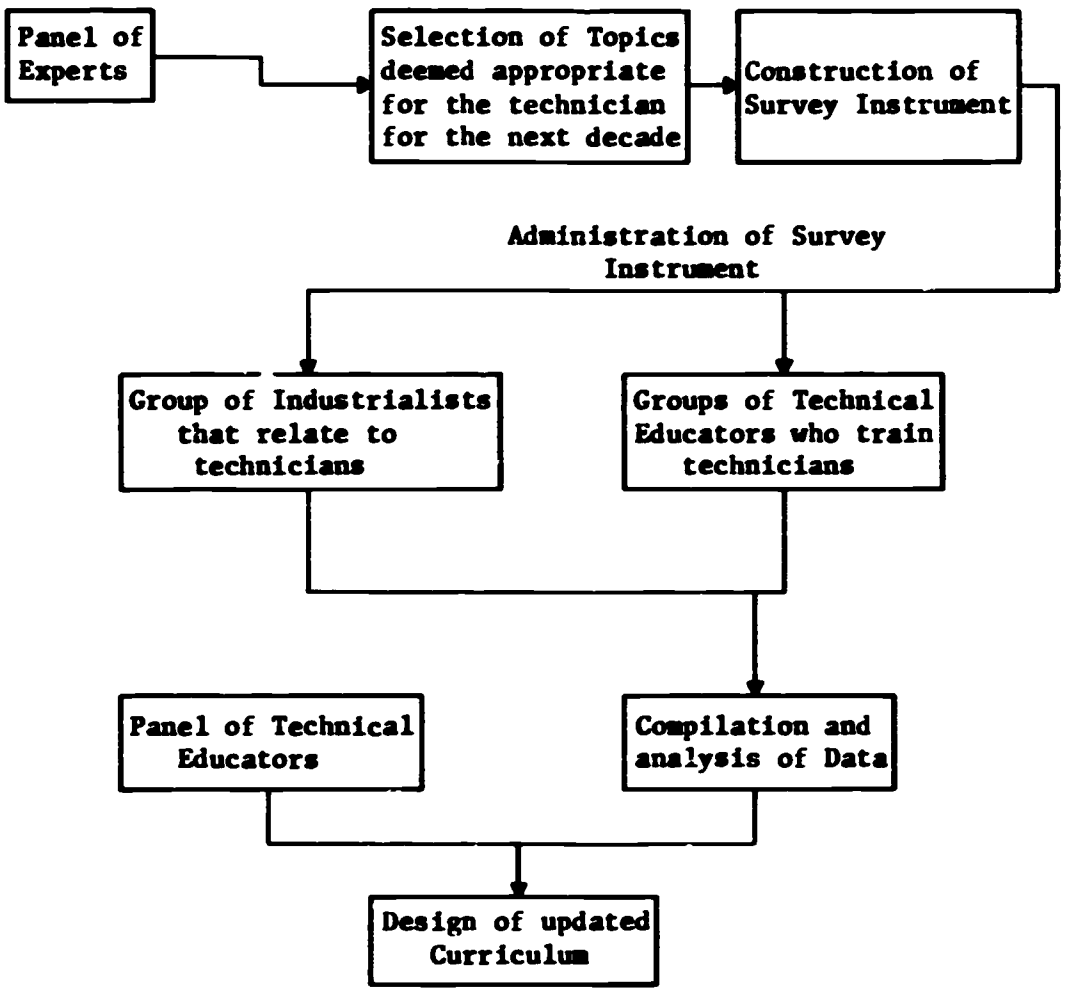


Figure 2

Conclusions:

In the past, the educational stronghold of two-year technical education was the technical institute. That era is now well behind us and the main thrust for technician education is found in the public community-junior college (18). This institution provides a new setting for technical education, an environment in which there is great potential for a true student mix. Furthermore, general education is viewed with greater acceptance and worth in the community college, perhaps wisely so in view of the fact that preparing youth for leisure and family living are considered as being just as important as preparing them for the world of work.

The emergence of the public community college upon the technical education scene has created a new kind of technical education. It is a historical fact that the blending of an existing type of education (technical education in this instance) into a new kind of educational institution (i.e. the public community-junior college) usually results in a modification of both the educational program and the institution. Hopefully, we will obtain a better kind of technical education in an improved version of the public community-junior college. A vital and exciting aspect of this new variety of technical education is the increased involvement of the university. This chapter has addressed itself to only six of the many roles the university could assume in an attempt to promote, improve and expand community college technical education. Hopefully, the role of the university in the days ahead will be even greater than that found today.

References:

1. Moss, Jerome Jr. Review of Research in Vocational Technical Teacher Education. Minneapolis, Minnesota: Minnesota Research Coordination Unit in Occupational Education, University of Minnesota, September, 1967.

2. Miller, Aaron J. Research Priorities in Technical Teacher Education: A Planning Model. Columbus, Ohio: The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University, October, 1967.

3. Roney, Maurice W. "Professional Education for Technical School Administrators and Teachers." Presented at the Annual Meeting of the American Technical Education Association and the National Association of Industrial Teacher Educators on December 5, 1965, in Miami, Florida.

4. Arnold, Joseph P. "A Long-Range Solution to the Shortage of Teachers." An article in Technical Education News (XXVII), January, 1968. New York: McGraw-Hill Book Company.

5. Some community colleges have had such poor experiences with "engineers turned technician teachers" that they hesitate to hire them. Their experiences seemed to have indicated that the engineer in many cases tends to be too demanding upon the technician student - failing to realize that he cannot perform at the academic level of the undergraduate engineering student.

6. A rather common example of the fallacy of industrial experience being always good of itself is the outdated engineer. Many two-year colleges have received applications from such individuals who wish to seek sanctuary from the rigors of keeping up in their fields by becoming instructors of obsolete subject matter to technician students. Because of the rapid changes going on in technology, the demand that technical instructors have industrial experience is becoming more and more irrelevant.

7. Storm, George. "Survey Explores Characteristics of Successful Teachers of Technical Education." An article in Technical Education News (XXV No. 2), February, 1966. New York: McGraw-Hill Book Company.

8. Koschler, Theodore A. "Checklist of Research Needs in Technical Education Programs." An article in Technical Education News (XXV, No. 2), February, 1966. New York: McGraw-Hill Book Company.

9. Stern, George C. "Environments for Learning." A Chapter in The American College (edited by Nevitt Sanford). New York: John Wiley and Sons, Inc. 1966.

10. Webster, Harold; Freedman, Mervin B.; and Heist, Paul. "Personality Changes in College Students." A Chapter in The American College.

11. Brown, Donald. "Personality, College Environments and Academic Productivity." A Chapter in The American College.

12. Kievit, Mary; Gillie, Angelo C. "A Comparison of Environmental Press and Selected Student Characteristics in a Community College and Technical Institute." A Study funded by the U. S. Office of Education.

13. These instruments included:
A general information questionnaire, a questionnaire on risk-taking associated with occupations, a questionnaire on open and closed mindedness, a job preference inventory, Study of Values (Alport, et. al.), College Characteristics Index (Stern, et. al.), and the Stern Activities Index (Stern).

14. This took the form of a one-page questionnaire that was sent to the dropouts as well as those who were still in college. The items asked whether their actual experiences in college came up to the expectations they had when they first entered college.

15. Nelson, Arthur H. "Coordinated Research Effort - Developing Technical Education Programs in Engineering Technologies." A paper presented at the Annual Meeting of the American Technical Education Association on December 5, 1966, in Denver, Colorado.

16. Some of the more widely known ones are:
a) The Center for Research and Leadership Development in Vocational and Technical Education. The Ohio State University. Columbus, Ohio.

b) The Center for Occupational Education. North Carolina State University. Raleigh, North Carolina.

c) Center for Studies in Vocational and Technical Education. The University of Wisconsin. Madison, Wisconsin.

d) Technical Education Research Center. Cambridge, Massachusetts.

17. This was a national study conducted by this writer as a doctoral dissertation entitled "A Study to Determine a Common Core of the Curriculum for Community College Electronic Technology Programs." (State University of New York at Buffalo in 1965-66.)

18. There is some talk about the emergence of new educational institutions, owned and operated by private business firms. These institutions would be operated on a profit-making basis. The belief held by some is that in the future there will be business establishments that will enter into contractual arrnagements with states and municipalities for the provision

of certain types of occupational education. This writer believes that certain types of vocational education, particularly the skill training aspects of it, can be done better by private businesses tooled up for the task. There are indications that such a trend is developing. See Averitt, Robert T. "American Business: Achievement and Challenge." A paper in Daedalus (Winter, 1969: Perspectives on Business). Cambridge: American Academy of Arts and Sciences, 1969 (p60).

CHAPTER 7

THE ROLE OF RESEARCH AND EVALUATION IN POST-SECONDARY OCCUPATIONAL EDUCATION

Introduction:

This chapter examines the subject of the role of research and evaluation in future occupational education within the rubric of the national two-year college movement. Research and evaluation are treated as if they are separate entities in many sections of this paper, but this is done only to permit us to better examine the role of each. In actuality, research and evaluation co-exist in many cases and are often inter-twined to the point where it is difficult to know where research ends and evaluation begins, and the other way around.

Research:

Up to a relatively few years ago, research in the area of occupational education was a rarity; and even where it was claimed to be in existence, it often turned out to be nothing more than a somewhat cursory gathering of statistics. The act of gathering the statistical information in many cases was the chief objective of the activity, with little attempt to obtain findings that could be translated into instructional or program improvements.

We are moving into a period where there is a serious beginning to an expanded effort in the design and conduct of research dealing with occupational education. Testimony to this statement is found in the "Vocational Education Amendments of 1968." This Federal Act allocates 10 per cent of its funds to Research and Training in Vocational Education (1:2). The Act further specifies that half of that amount will be used by the individual States for research purposes and the remaining half would be allocated by the Commission of Education to institutions of higher education (and other agencies) for research endeavors. The Act also points out that the funds available for research grants and contracts can be used for (1:16):

(1) research in vocational education;

(2) training programs, designed to familiarize persons involved in vocational education with research findings and successful pilot and demonstration projects in vocational education;

(3) experimental, developmental, and pilot programs, and projects designed to test the effectiveness of research findings;

(4) demonstration and dissemination projects;

(5) the development of new vocational education curricula; and

(6) projects in the development of new careers and occupations, such as -

(a) research and experimental projects designed to identify new careers ...

(b) training and development projects designed to demonstrate improved methods of securing the involvement, cooperation, and commitment of both the public and private sectors toward the end of greater coordination and more effective implementation of programs for the employment of persons...

(c) projects to evaluate the operation of programs for the training, development, and utilization of public service aides ...

Therefore, it can be seen that the Federal Government is solidly behind the idea of promoting research in occupational education, and will hopefully increase its financial involvement in the years ahead.

We shall delimit our discussion to the need for research dealing with (1) curriculum design, (2) student characteristics, (3) institutional characteristics, and (4) computer assisted instruction.

The future of occupational education in the community colleges is largely dependent upon our approach to it. We cannot for long afford to "stumble and bumble" along without the information which can be obtained from properly designed and conducted research. If we should persist in acting in the same old way, i.e., establish programs primarily on the basis of the perceived present day needs of the business-industrial community, occupational education will go on being the least attractive segment of the community college offerings. The notion that vocational education should serve industry is an old one, going back to the 1890's, reaffirmed in the Smith-Hughes Act of 1917, and reaffirmed a thousand times over

with sickening repetitiveness by occupational educators. This gives students and their parents the feeling that these programs shunt the students away from the mainstream of higher education and is one of the major reasons for its unpopularity.

This writer believes that occupational educators should not consider themselves primarily as the trainers of higher specialized manpower for the business-industrial community. Specific job-training is best done by the industries themselves with their equipment and in their facilities. Support for this enlightened viewpoint is found within the Federal Act cited in the preceding paragraph. In the section of the law referring to exemplary programs, it is stated that funds can be used, among other things, for the broadening (italics are mine) of vocational education curriculums (1:18). Not only are job-oriented occupational programs next to impossible to keep up to date (because of the rapid technological changes going on all the time), but they are considered undesirable from the human values point of view. To provide narrow training for a specific job within the context of an occupational education program deprives that student of exposure to those aspects of his education that are vital to his "off the job" life. Furthermore, measures should be taken to insure that the specialized portion of the occupational program be aimed at that occupation's "family" or "cluster." Heavy emphasis should be placed on developing student flexibility. David expressed it in this way (2:298):

> What is required .... is preparation for the central fact of continuing change: of continuing change in bodies of knowledge, in ways of doing things and utilizing skills, in materials and products, in occupational functions, in forms of organization and structure .... highly specialized manpower must not only be equipped to perform existing tasks, but, by virtue of the breadth of education, also prepared to assume new functions without great strain or sizable new training costs.

This approach calls for research in curriculum design, if we are to accurately identify the materials and techniques to be used in futuristic oriented occupational programs. By research, we mean the kind of inquiry described by Charles F. Kettering when he said (3:216):

> Research is a high-hat word that scares a lot of people. It needn't ... It is nothing but a state of mind - a friendly, welcoming attitude toward change.... It is the problem-solving mind as contrasted with the let-well enough-alone mind. ... It is the "tomorrow" mind instead of the "yesterday" mind.

Future occupational programs will be designed around the findings of intensive and extensive searches for those curricular topics that will most likely remain an integral part of the occupational cluster for as long as ten years ahead. Such studies will be conducted for each occupational cluster at frequent intervals, hopefully at least every five years. One such study was examined in Chapter three and from it an overall approach tc curriculum design has been suggested (4).

It is becoming increasingly evident that occupational programs, if they are to succeed in their mission, must be designed around the needs of students first, and around the needs of industry secondarily. At first glance, this may seem to be a radical departure from the traditional goals of occupational education; but this is not the case in actuality. One of the major needs of young people is to prepare themselves for entry into the world of work - but this does not mean specific skill training, since there is much more to preparing for the work world than that! This is of particular importance, because it is the way in which our society initiates its young into the adult world. Shaping occupational programs with this in mind is a part of the new emphasis being emphasized here. This, of itself, is not a new approach; but let us not forget that these students will spend the majority of their hours off the job, i.e. the job will not be the central part of their lives. Consideration of this fact when designing occupational programs is the new element here.

The following statement by Sanford (5:15) is appropriate to this discussion. He wrote:

> The great mass of our young people need above all an education that prepares them for life outside the sphere of their occupations. To say this is not to suggest any lowering of standards of work; it is to speak of an area of activity to which the narrow conception of academic excellence does not apply.

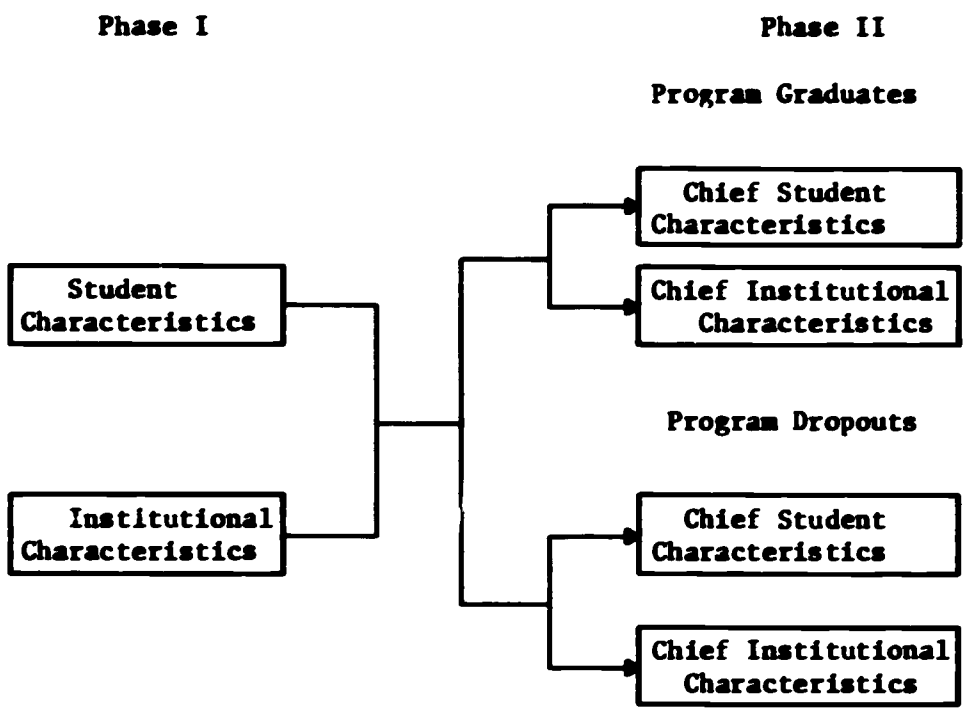
Therefore, in determining the level of excellence of an occupational program, the basis for this judgement should include a comparison of the level of development of the student when he enters the program to the level of development of the student when he leaves the program.

Broadening the goals of occupational education to include student development means that we must learn much more about student characteristics, the school environment, and how students interact with the college environment.

Some earlier efforts in this direction that primarily dealt with the four-year college and university (6, 7, 8) serve as a partial guide for us. A study which deals more specifically with selected community college occupational program students in nearing completion (9) and may serve as a model for other investigations of this sort. In this study, a total of 900 students from four occupational curriculums in a technical college and a community college were given a series of tests before they attended their first class sessions. The tests were then administered during the last semester of the two-year program to the originally tested students who graduated. The data obtained will provide a basis for identifying those elements between certain student characteristics and institutional characteristics that appear most often in those students that have completed their programs (see Figure 1). Studies of this type move in the direction of providing substantive data that will link certain student and institutional characteristics with successful completion of certain occupational programs. Also, those combinations of student and institutional characteristics that are prevalent among dropouts will be uncovered (see Figure 1). Ultimately, such investigations might put us further ahead in our attempts to successfully match students with programs and institutions. Research of this nature is a must if we are going to have "student-centered" programs instead of "work-centered" programs.

In addition to research in curriculum, student characteristics and institutional characteristics, there needs to be a greater research effort made in the area of teaching and learning. High on the list of researchable activities in this area is the utilization of computers. Patrick Suppes of Stanford University cites two basic arguments for computer assisted instruction (10: 157-174). They may be briefly itemized as follows:

1. It permits educators to provide a greater amount of individualized instruction.



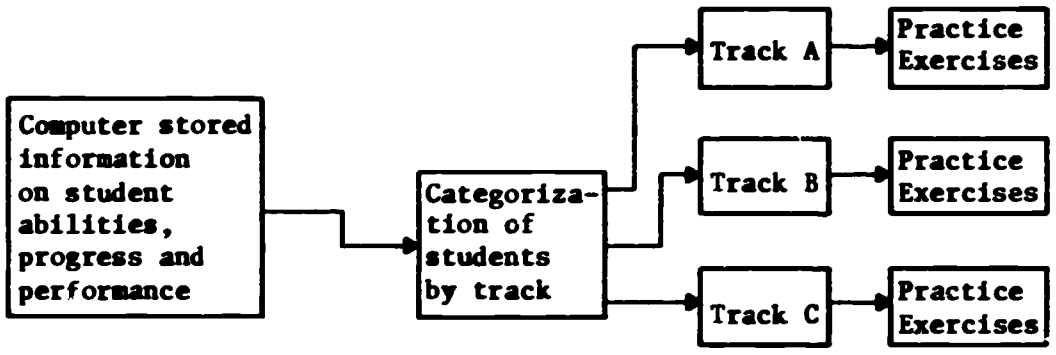
Model of Student-Institutional Characteristics Study (8)

Figure I

2. It permits the educators to have on hand daily information on student progress and performance, thereby facilitating the process of making daily decisions and conducting evaluation.

The interaction between a computer program and the student can occur at three levels. The first level of interaction, most commonly known as the "drill and practice" systems, is not teaching in the true sense but a supplement to the curriculum taught by the instructor. This level of interaction can be wisely incorporated in those occupational courses where certain skills are best developed by practice. The utilization of computer programmed drill and practice systems makes it possible to offer multiple-track instruction for each occupational curriculum without requiring an unrealistically low student/instructor ratio. This approach requires the design of the occupational curriculum with a number of tracks (or levels) and then the development of the practice exercises needed for each track. Then, using the computer derived information relating to the students' abilities,

past progress and performance, each student can be programmed into the appropriate track. Figure 2 depicts a generalized model of this approach. It should be pointed out that only certain parts of occupational courses lend themselves to the wise use of repetitive drill type exercises. Many aspects of most courses would not benefit from this technique.



Generalized Model of Computer Programming for Multiple-Track Occupational Program Practice Exercies

Figure 2

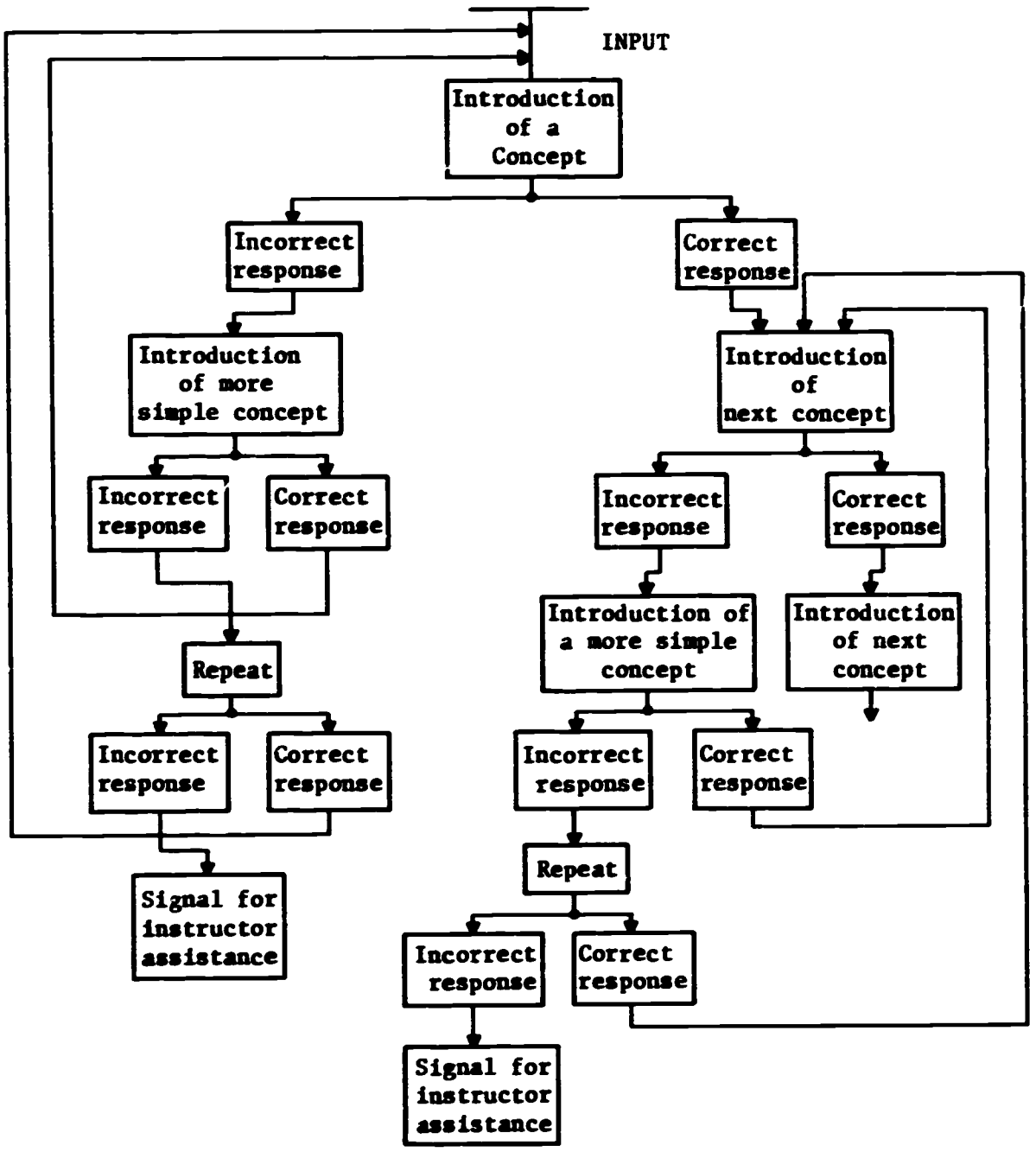
The second level of interaction between the student and the computer program consists of "tutorial" systems. The objective of tutorial systems is to assume the main task of teaching from the instructor. Tutorial systems, if they are to be successful, must be designed so that more simple presentations are offered to the students who fail to correctly respond during the first try. This is illustrated in the generalized model for tutorial instruction in Figure 3.

The use of well planned tutorial systems can accomplish two objectives:

1. It provides a high degree of individualized instruction.

2. It enables the instructor to individualize his instructional efforts, since he is freed from many of the classroom responsibilities.

Of great interest is the fact that much of the material in occupational education, which requires at least some degree of actual performance, lends itself to this kind of instruction.



Generalized Model of Tutorial Instruction

Figure 3

The third level of interaction between the student and the computer program involves "dialogue systems." At the present time, only a few very elementary prototypes of dialogue systems exist, but it is predicted that such systems will become a reality in the years ahead. Many very complex problems are involved. Programs will have to be written that will: (1) recognize and provide answers to questions that are relatively broad and complex, and (2) recognize the spoken word of the student.

Experts in the field of Computer Science are predicting that these problems will be overcome in the next few years. Computer centers, designed to serve as information and program storage areas, will serve as the nucleus for computer based courses and curriculums.

The utilization of the computer in providing greater accessibility of education to the public is associated with the discernable trend toward making education competitive with the other segments of the American economy. The necessity of moving in this direction is given emphasis by Averitt in the following statement (11:74):

> In the present economy, the American consumer is confronted with a choice between the heavily advertised, mass and process produced goods of center firms and the ill-advertised, craftsmen-produced services of, for example, health and <u>education</u> (italics mine). ... Our imbalance in production techniques threatens us with a society where comforts accumulate while human potentialities decay.

This imbalance can only be remedied by developing educational services to the point where they are competitive with the material comforts for the public's dollar. There are signs that such a movement is afoot. It is common knowledge that a great number of the large business-industrial firms are beginning to move into the education field in earnest (12:100). There is much reason to believe that the development of techniques that will permit the use of the computer at the dialogue level will be an integral part of this important movement.

<u>Evaluation</u>:

Evaluation is one of the least attractive words in the field of education, and occupational education is no exception; but as occupational education attempts to make its case to the public for more and more funds, it seems that such requests need to be based

on tangible objectives. What we are really saying is: The objectives of occupational programs should be measurable. This becomes increasingly more necessary as education finds itself in competition with many agencies for tax derived funds. It seems reasonable to assume that those activities that can demonstrate the achievement of tangible results stand the best chance of surviving the battle of acquiring public funds.

There appears to be a national trend toward increased accountability in the use of public monies, as indicated by the national attention being given to "Planning-Programming-Budgeting Systems" (commonly referred to as PPBS). Many states have already decided to adopt PPBS as a major approach to determining how to spend their funds in the wisest way. Therefore, we can see several very good reasons for looking to PPBS for suggestions in the evaluation of occupational education.

PPBS, first introduced by Secretary McNamara for use in the Department of Defense, was later adopted on a wider basis by the Federal Government. In 1965, President Johnson initiated PPBS throughout the Executive Branch of the U. S. Government. Since that time, as indicated above, several State Governments have adopted PPBS; and it is felt that other states will begin to utilize PPBS in the near future.

What is PPBS? It is an approach to planning, programming, and budgeting that attempts to insure the maximum benefit for the investment. The utilization of this approach (13:9) would impose several demands upon occupational program educators, including the following:

1. Objectives and goals of all programs must be precisely and carefully developed. This means they should be measurable. They may very likely be the outcome of a research activity.

2. Every occupational program should be evaluated to see to what extent it meets its objectives and goals. The benefits derived from the conduct of the programs should be weighed against their costs.

3. There should be a serious examination into alternative ways of achieving the objectives and goals set down in the first place (14). This can also be a research endeavor.

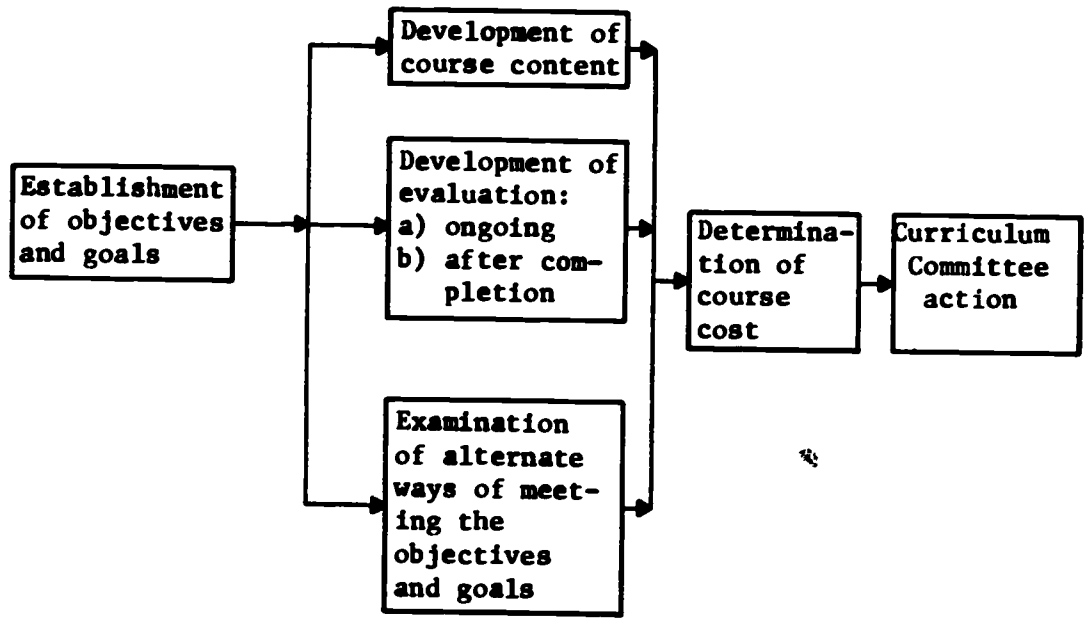
4. Based on the analysis developed in the procedure stated above, the budget for the programs is prepared. It is important that the budget request be justified within the context of the long-range program and financial plan of the college and the state or region.

It seems reasonably safe to predict that the utilization of the PPBS approach is going to be more widely adopted in the years ahead. This writer feels that it will become one of the most accepted methods for the evaluation and analysis of occupational education programs.

Many of us also believe that the PPBS approach has much to offer in the development of new courses and the redesign of existing courses such that an evaluation plan can be built into each course. A number of educators have the habit of saying that many of the outcomes of education are intangible and can't be measured. Although there is some truth to the contention, it doesn't preclude the fact that every course should have some objectives and goals that can be measured. The important thing is to start at the beginning, i.e. (1) establish the measurable objectives and goals, (2) seek out the ways in which the course can achieve them, and (3) develop techniques by which the course outcomes can be measured. The course content should be designed only after the adoption of the objectives and must be aimed at meeting them in a verifiable manner (see Figure 4).

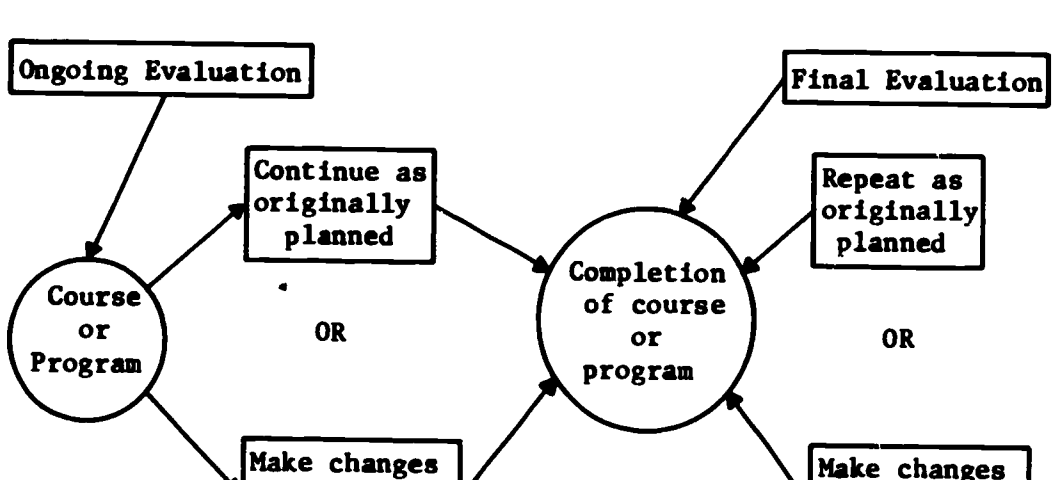
To accept this as a mode for course development can result in builtin evaluation devices and methods that will maintain an ongoing vigil over the effectiveness of any course in terms of its own objectives. One argument some conventional educators will use against this approach is that it constitutes prying into the professional affairs of the instructor and his classroom. Such an argument falls flat when provisions are made to see that the instructor himself, perhaps in cooperation with other instructors with similar academic competencies, is the one who is to establish the objectives, goals and course content, and also is the one conducting the evaluation. Furthermore, the adoption of this approach for the evaluation of instruction, courses, and programs can take on the characteristics of the kind of evaluation that goes on in other professions - where the quality of the output is continuously scrutinized.

Evaluation of this nature is of the most pragmatic kind, because it serves as the launching pad for continuous examination of course, instruction, and student progress. It provides the mechanism from which mistakes can be quickly identified and



Course Development and Evaluation: PPBS Style

Figure 4



Program-Course Evaluation: PPBS Style

Figure 5

rectified before the damage done becomes too excessive. I feel it important to restate again that the evaluation of courses in this manner (as shown in Figure 5 will find maximum success when it becomes an accepted tool in the hands of the faculty. Course outcome accountability, not only is the best method of evaluation we know of at this time, but is also a mark of high level professionalism.

Summary:

Post-secondary occupational education will become more concerned with research and evaluation in the coming years. It has been pointed out here that some of the major areas in which great efforts in research will be made include curriculum design, refinement of identification of student characteristics, identification of relevant institutional characteristics, and computer assisted instruction. As more breakthroughs in computer assisted instruction are made, the role of the teacher may undergo radical changes. Improved utilization of the computer in the instructional area may indeed be the beginning of a movement that will push education out of the craftsman realm to where it can become competitive with the mass produced comforts for the public's money.

Evaluation of occupational programs and courses will become an integral part of the curriculum in the years ahead. One of the primary incentives for moving in this direction is the increased demand for accountability of public funds. The great popularity of PPBS is evidence of this. Hopefully, educators can constructively respond to this demand by devising new approaches to program-course development which will utilize evaluation as the basis for ongoing improvement as well as program-course-student outcome assessment.

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In discussing present trends in which private enterprise is becoming increasingly involved with public matters, Goldston made the following statement:

> ... the extent of public management of education will change as schools increasingly contain advanced educational equipment. General Learning (made up of Life and G.E.), Raytheon Education Co., R.C.A.-Education, and other industrial firms are already planning to penetrate the public education field through teaching machines and the related software.

13. Planning-Programming-Budgeting. Prepared by the Subcommittee on National Security and International Operations of the Committee on Government Operations, United States Senate. Washington: U. S. Government Printing Office, 1967 (83-479 0).

14. The search for alternative ways of achieving the objectives and goals should extend into the business-industrial community. As pointed out elsewhere in this Chapter, many of the large business-industrial firms are moving into the education business. It is reasonable to assume that the more progressive businesses will design educational systems that will meet the objectives of certain highly specialized occupational training type programs with more success and greater economy than previously accomplished by vocational educators. Although this statement will be challenged by many vocational educators, this writer believes it will become a proven accomplishment within the next few years.

CHAPTER 8

PROGNOSIS

Introduction:

In this final chapter, there will be an attempt to "guesstimate" the direction in which several aspects of post-secondary occupational education will take in the years ahead. The selection is based on the belief that they are the leading issues involved in the shaping of the overall rubric of vocational education in the two-year colleges. These issues deal with the following:

1. Faculty identification problems and their relationships to faculty militance and unionism.
2. Innovation: the ingredients needed to foster actions and the nature of spreading new ideas.
3. Separatism and the very real possibility that it will experience a strong resurgence if the two-year colleges don't adequately serve the needs of occupational education.
4. The independent two-year college: will it receive the public support that it so desperately needs and deserves?
5. The emergence of a new public school configuration (the 6-4-4 scheme) and its implications for post-secondary occupational education.

Faculty Identification:

It is common knowledge that the two-year college, during the past twenty years, has brought the idea of a universal 14-years of schooling for most American youths closer to actuality. At this time, the year 1969, there are two million two-year college students in the United States. Woodman stated (1:7):

> ... by 1972 --- when more than half of the country's college population will be in that kind of school - public, free, tax-supported, locally and vocationally oriented, serving a commuting student body with open-door admissions for most.

Prior to opening the flood-gates to entry into higher education via the now common two-year colleges, a faculty member in a traditional junior college has less difficulty in conjuring up an image

of himself as a college professor - and not uncommon was an accompanying state of euphoria. As recently as a generation ago, most of these institutions were mainly oriented toward the potentially four-year college bound student. The courses they taught were similar, in not actually carbon copies of, the freshman and sophomore courses offered by the big brother university in the neighboring county. Although there was a difference in the prestige between a university professor and a two-year college professor, that difference was smaller than the gap that existed between the junior college professor and the high school instructor. Therefore it was relatively easy for the junior college professor to associate and identify himself within the framework of higher education.

Things are changing now, and the separation between high school and the two-year college is becoming increasingly more fuzzy. This is greatly due to two types of events:

1. Many of the community colleges, in their attempts to better serve the post-high school age youngsters in its region, now offer courses and programs that are academically at the traditional high school level.

2. Because of the impetus provided by several societal forces, the community colleges are much more vocationally oriented than the old-time junior college. The result is the emergence of a diverse offering of occupational programs that would have been totally unacceptable in the junior college of a generation ago.

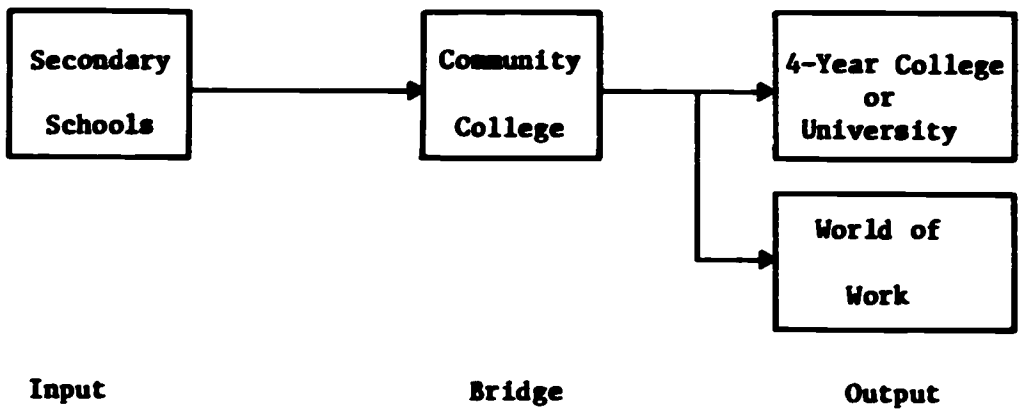
These two trends have made it possible for youngsters to attend who have average and below average academic high school records. This is the group that in the past has been screened out of higher education for the most part (unless the youngster came from a home of superior financial means). The presence of such programs and the abundance of relatively non-academically minded students can be somewhat nettling to some of the more traditional junior college faculty members. The literature shows that a significant proportion of the two-year college faculty were originally high school teachers. It seems reasonable to assume that many of them had moved up into a "college" teaching position with the exception that it would be a little more academic than what they actually found to be the case upon arriving on the scene. Subsequently a number of them tend to develop identification problems - the environment seems very much like high school in many ways, but they want to be considered college professors. This type of dilemma can be the major catalyst in

the brew that ferments into faculty militancy, which is one of the steps toward college faculty unionism. Therefore, the democratization of the two-year colleges (via diversification of programs) has resulted in many of the faculty members feeling like marginal persons - they are in the process of leaving one group (high school faculty) but as yet not totally accepted by the group they are trying to enter (higher education). Mayhew expressed this phenomenon in the following way (2:343):

> Characteristics of marginal men are anxiety, punitiveness, rage, and a search for scapegoats. The administration is available and a union or a militant senate is a potential instrument. One can well argue that unionization will appeal least to those prestigious private institutions in which the professionalization of the faculty is farthest advanced. Those professors have lost their marginal status.

It would seem that, as the democratization of the community college continues to the point where the associate degree will replace the high school diploma as the minimum work prerequisite in our society, the community colleges will lose even more of their "college" image. But it would be a tragedy for the movement if it reverted back to the secondary school image. It appears that the two-year college may best solve the "marginal problem" by demonstrating that they are neither "high school" nor "traditional college", but in fact are a new breed of institution within the framework of higher education. Some observers of the community college movement believe that such a demonstration is in progress now, and will require a decade or so to develop this new image. The hope is that the two-year college will take its place in the overall framework of education as a new form of college that provides a bridge - a bridge from the secondary schools to a) the work world for some of its students and graduates and to b) the 3rd year of the four-year college and university for other graduates. Figure 1 depicts this framework.

If this present demonstration succeeds in proving that it is such an institution, then the junior college professor will have lost his marginal status.



THE TWO-YEAR COLLEGE AS A BRIDGE INSTITUTION

Figure 1

Gleazer recently indicated his reactions toward the prestige factor when he said (3:5):

> This whole matter of prestige - or lack of it - has become a troublesome issue, as I see it, for community and junior college people as they seek support, both moral and financial, for the kind of education we represent .. But I think it is time we speak out more forcefully and more eloquently on this subject ... our "prestige" lies in the challenge of teaching in a type of institution that is on the cutting edge. The professor who opts for "Famous University" may just not be the individual who can do the kind of thing that is needed in our field. Frankly, I think there is considerable evidence that more and more men and women who really want to teach are gravitating toward the two-year college ... Prestige must be measured in terms of the purpose and the way the institution goes about meeting its purpose. For the community college that means meeting the educational needs of the many who might not be served otherwise. Nothing to be ashamed of, we think.

As the community colleges and their professors that teach in them gain recognition for that kind of achievement, their marginal status will gradually lose its edge and eventually dissipate. The concomitant result could be an increase in institutional and personal prestige and a reduced concern with faculty militancy and unionism - because they are relevant only in marginal circumstances.

Innovation in the Two-Year College:

Innovation is not always clearly understood, as evidenced by the many activities classified as such but in actuality are not innovative at all.* So let us define innovation as (5:14):

> a deliberate, novel specific change, which is thought to be more efficacious in accomplishing the goals of the system.

One of the problems in trying to develop ideas on workable innovation strategies is the simple fact that we have very little real knowledge on how colleges function and how we can convert their environments into something that would be more conducive to innovative happenings.

Orton (6:2), among others, states his doubts about an institution becoming more conducive to innovations in curriculum, teaching, and the like, by a mere manipulation of the college's formal structure. Of greater importance than the formal structure of the college are:

1. The College's Goals: A college needs to have impact. This is most readily achieved by embracing a limited number of goals that can be well integrated into the very fabric of the institution. They should be continuously examined by the various groups within the college.

2. Inter-group transaction: There must be a continuous interchange of ideas among the various groups within the college on such matters as curriculum development, promotion, hiring, and admissions.

3. All the persons involved (faculty, administration, and students too) must be as much concerned about the college as they are about their own needs. This involves serious and extended and continuous attempts to integrate the needs of the constituents and the institution.

Another vital ingredient in the make-up of a two-year college that would better enable it to move in the direction of being

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* As an example, the proceedings of a Leadership Development Seminar recently held described a number of programs as innovative, many of which do not really fall in that category (4).

conducive to becoming innovative is the presence of a flexible president. Orton expressed this idea in the following manner (6:4):

> ... that he possess an unusual facility for assessing the needs of the organization -- the faculty, students, even himself -- and then flexibly using himself in ways that are consonant with the requirements of the situation. For it is the situation, woven out of the history of the institution's past, the realities of its here and now, the requirements of its future, which call for behavior as wideranging in its repertoire as to include styles which may be autocratic, charismatic and democratic.

When innovation does occur, it invariably produces a number of stresses within the institution. The critical aspect of this fact is to ascertain whether that stress is functional or dysfunctional. Dysfunctional stress often results when the innovative attempts are made through (6:4):

> ... covert manipulation, through win-lose strategies, or through silent collusion in which individuals affected by a proposed innovation "accommodate" the entire process by avoiding confrontations.

Resistance to innovation are well known. Watson made several generalizations relative to this phenomenon (7:22). In order to minimize that resistance, they (the changes) should be made and operated by "insiders" and also be enthusiastically supported by the top administrators. The resistance can be minimized if the innovation: a) reduces the burdens of the faculty and staff; b) is in accordance with the values and ideals of the instructional members; c) offers interesting new experiences for the participants; and d) offers no threat to their security or autonomy. Furthermore, resistance would be less: a) if the participants have a hand in identifying the basic problem associated with the innovative effort and subscribe to its importance; b) the project is fully agreed upon by the group; c) the innovators are capable of recognizing the objections to and fears of the project by those in opposition to it; d) prior arrangements have been made for feedback and additional explanation of the project when necessary; e) the people involved in the innovative project develop positive relationships with one another; f) if the project can be readily altered when experiences warrant such changes. Watson's last criterion dealt with climate for change, he said (7:23):

> Readiness for change gradually becomes a characteristic of certain individuals, groups, organizations, and civilizations.

Dietrich reported a structure that was considered to foster instructional innovations, he said (8:4):

> My advice to any administrator considering the development of a structure catalytic agent would be as follows: 1) establish a small directorate, 2) provide the director an overview of academic problems, 3) give the director access to key faculty commit tees, 4) coordinate existing expertise, 5) provide discretionary funds, 6) build a grant procedure, 7) encourage faculty to submit proposals, 8) provide continuing liaison with projects, 9) build in evaluation, and 10) establish regular university support for successful projects.

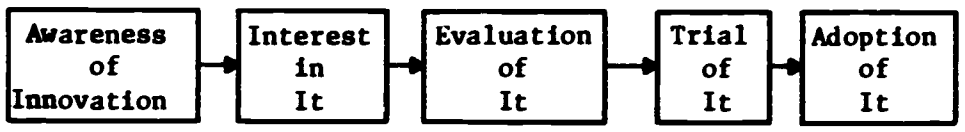
It would seem that the above structure has many features that could be wisely used in the development of the "Office of Research" in the two-year college.

Let us next turn to the manner in which innovations are spread within an institution and among a number of institutions. In a study of the manner in which innovations are diffused, Rogers found four fundamental elements in the diffusion process. They are (9:12):

a. The development of the innovation;
b. Its communication from person to person;
c. Its communication within the framework of a social system (i.e. the college in our case);
d. Its communication over a period of time.

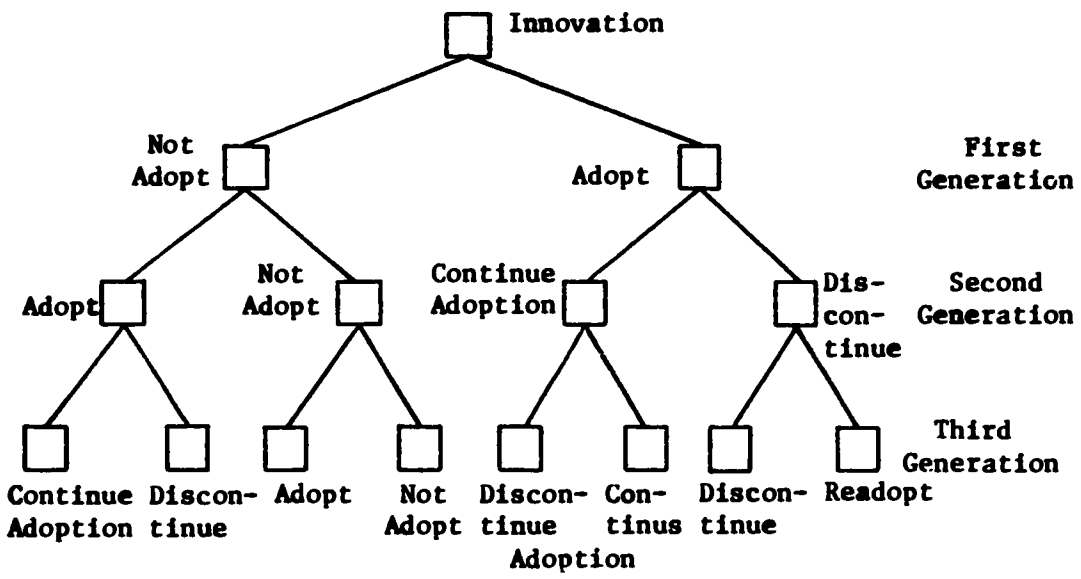
The diffusion of the innovation may or may not result in its adoption. Let us now examine the ingredients inherent within the process by which an innovation becomes adopted. The adoption process can be identified as a five-step process, they are:

1. Awareness of the innovation;
2. Development of an interest in it by others;
3. The interested person(s) evaluates the innovation in terms of his present and anticipated future circumstances and then decides whether or not he will try it;
4. The person(s) tries out the innovation, probably on a limited basis;
5. The individual decides to incorporate the innovation on a full scale.



FLOW DIAGRAM OF THE ADOPTION PROCESS

Figure 2



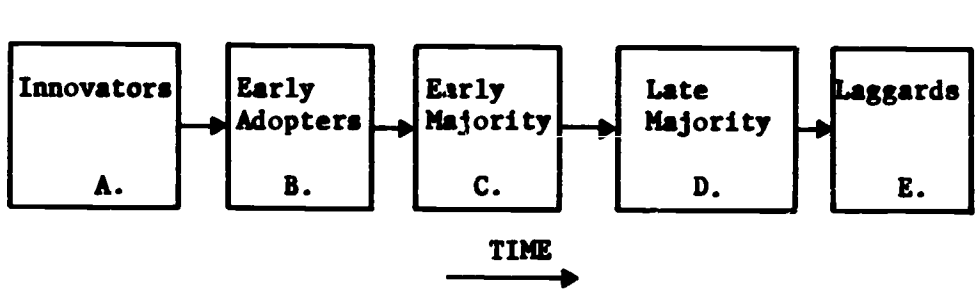
The Innovation-Use Tree
(with three generations of decisions)

Figure 3

The following discussion refers to Figure 8. First Generation: The individual or institution has the choice of adopting or not adopting. Second Generation: Those that chose to not adopt in the first generation decision can not adopt or continue to not adopt. Those that adopted in the first generation decision can now elect one of two choices - to continue the adoption or to discontinue the adoption. Third Generation: There are now four groups of people, each of which have two choices, as can be seen in the third generation level of the Innovation-Use Tree.

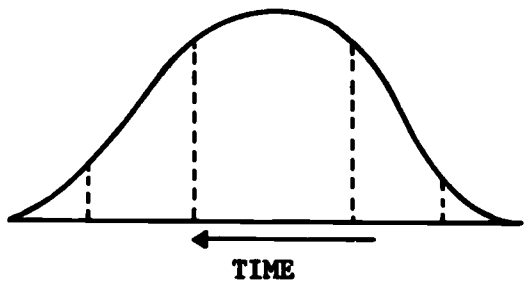
This type of diagram is called a "tree" because each possibility at a given level then branches into two possibilities in the next level (or generation). Therefore, it can be said that it has a branching effect that resembles the manner in which a tree grows, with the original innovation being the truck.

It has been found that the distribution of adopters tends to follow a bell-shaped curve over a period of time and approaches normality (9:192). We can display the continuum of innovation adopters in the form of a flow diagram (see Fig. 4) and also in a normal curve (Fig. 5.).



FLOW DIAGRAM OF INNOVATION ADOPTERS

Figure 4



NORMAL DISTRIBUTION OF INNOVATION ADOPTERS

Figure 5

We can elaborate on the relationship between the continuum of adopters and the innovation-use tree. As mentioned in the preceding paragraph, the innovators are the trunk of the tree. The early adopters may be thought of as those that adopted the innovation in the first generation of decision-making in the tree diagram. The early majority adopters would be from those individuals or institutions that did not adopt during the first generation decision period. They are represented by the "adopt" block at the extreme left side of the second generation line in Figure 3. Continuing with the anology, the late majority adopters would be from those that failed to adopt during the first two generations but did adopt in the third generation (this is represented by the "Adopt" block in the third generation line in Figure 3). The laggards would be the remaining non-adopters and they would be the ones who adopt at some later generation of decision making.

As one might expect, there are differences in the individuals found in these categories. The innovator tends to be a more venturesome type person. The laggard is most often the traditionalist element of the population that incorporates the innovation.

Innovators see themselves as deviant from the norms of their social system, which greatly accounts for their need to depend on Opinion Leaders to assist in the adoption process. In other words, the innovator himself is often not able to promote his ideas to the point that they are adopted on a wide-spread basis without the active assistance of individuals who are respected by the group at large - the Opinion Leaders. Opinion Leaders are those individuals that others within that group would tend to turn to for advice and information. It has been found that Opinion Leaders are most effective in promoting the adoption of innovations for the late adopters, who tend to be skeptical of the innovator and the innovation but can be assured and convinced by someone they trust and respect. The early adopters, on the other hand, tend to rely more on their own judgment of the innovation, which they make on the basis of the facts made available to them.

In conclusion: It would seem that the two-year colleges could greatly benefit by developing structures with some of the characteristics described by Orton, Watson, and Dietrich. Coupling this with the wise utilization of the known characteristics of the innovation diffusion process could provide them with the chance of making a giant stride toward the enhancement of the development and adoption of innovative ideas. Those that do so will be the community colleges that will most likely be on the cutting edge of post-secondary occupational education as well.

At the same time, some innovations will originate from outside that institution, either at another two-year college or a university. As indicated in several places in the preceding paragraphs, the adoption process then becomes more difficult and complex. The community college's Office of Research would most likely have to serve as the early adopter in such cases and also be the source for finding and enlisting the support of good Opinion Leaders. If this can be done, then a suitable diffusion agent has been found and the adoption of the innovation becomes closer to reality. Because of an institution's natural defensiveness to the ideas that originate from outside that institution, this approach may indeed by the only real chance of bringing in innovations that are developed elsewhere. Such an approach would enable the research capabilities of the universities to be of greater utility to the two-year colleges than has been the case in the past. There are signs that offices of research are being set up in many of the two-year colleges, therefore, the possibility for these things happening appear to be good.

Separatism:

Although much is said about the great popularity of the community college movement and its intentions of offering both vocational and preprofessional programs under the same academic roof, there are some disquieting signs that counter-type forces are in operation. The most significant forces aimed at separatism at this time is probably the area vocational-technical school movement. One of the basic tenets of the area vocational school is to provide a special facility for the offering of occupational programs for a school district or geographic region. The idea has been receiving support in the form of federal funds since the passage of the Vocational Education Act of 1963. Many of the area vocational schools are involved with secondary school vocational education only at this time, and many of their administrators claim that their efforts will be confined to that level. However, the concept of the area vocational schools is one that clearly indicates that it could just as well serve in the post-secondary area. Many educators feel that it will be just a matter of time before they begin to make inroads into post-secondary occupational education.

In many states, a simple legislative act is all that is required to permit the area vocational schools to grant associate degrees. What will such a trend do to occupational education and the community colleges? It seems logical to assume to it can only serve to do harm to both. The amount of funds available now, and to be available in the future, for post-secondary occupational education is limited. The emergence of another institution as a separate

entity competing for the same limited funds could lead to the compromise type solution that politicians are apt to make; i.e., the limited funds will be divided among the competing schools. The result could be the proliferation of post-secondary occupational programs, all of which would be poorly financed. Furthermore, the area vocational schools are probably the result of certain vocational educators who are quietly, but persistently, pushing for the separation of occupational education from the mainstream of American Education. It should be sufficient to recall that separatism has been argued against by many educator leaders from the time vocational education appeared on the scene. Dewey (10:499-541) cautioned against it near the turn of the century. One of the more recent proponents for comprehensive institutions is Venn (11:94).

In many instances, the supporters of separatism have had some cause for complaints about the comprehensive institutions. There have been (and still are) a sizable number of community colleges that have been practicing "elitist" type approaches to vocational education. This is what they are actually doing when they decide that the more prestigious occupational programs are "collegiate" and these are the only vocational programs they will offer. The many other occupational programs, which they identify as being "below-collegiate level" and not appropriate for their institution, they say are to be offered by some other institution or not be available at all. This "other institution" became the area vocational school in many cases. So it can be seen that some community colleges, while preaching about their comprehensiveness, quietly eases out the student with the less attractive academic credentials. It seems that the continuation of this type of selectivity will force society to develop that "other institution" - and we will then have the continuation of separatism.

Separatism can be most effectively contained by planning intelligently. At the federal level, a greater share of funding for vocational education should be earmarked for the support of occupational programs in comprehensive post-secondary institutions, thereby removing that silent inducement for establishing special institutions for occupational education. On the state level, there needs to be a well thought out Master Plan for all aspects of higher education, including the occupational education aspects of it. The Master Plan should make provisions for the change-over of area vocational schools into comprehensive institutions (this includes the secondary schools as well) and set a time table for each of them to comply. At the same time, this same Master Plan should mandate that at least fifty per cent of community college

enrollments be in occupational programs of diverse academic levels. It seems to this writer that the community colleges' hope for the future lies in this approach - the translation of comprehensive program offerings from theory to actuality.

Another element that is helping to keep the separatism issue alive is the recent emergence in some strength of private industries going into the education business. Many of their programs initally were meant to train people for jobs in their own companies. Recently however, a number of large commerical concerns have formulated educational divisions which offer their services on a contract basis (12:60). One good feature of such a movement is the possibility that we can finally get "training" out of the educational system and into industry where it rightfully belongs. But there are some aspects of this trend that are of some concern. There is an inherent danger in that it is relatively easy to move from a training program into a program of subtle indoctrination and propagandizing. Sometimes the line between the two is indistinct and difficult to recognize until after it has been crossed.

It seems that certain safeguards should be established in those cases where training is contracted for, so as to insure these youngsters have a good measure of true education before they are shunted into one of these types of programs. Education for "out of work hours" living is probably more important for the lower academic level occupations than the preparation for the actual job. The twelve hour work day of several generations ago has evolved into the thirty-hour work week, leaving large amounts of leisure time. Furthermore, because of the nature of many jobs today, there is an impersonal environment in the world of work that must be supplemented with rich out-of-work-hours living and experiences, if some degree of mental health is to be had by these individuals. This requires preparation for these individuals too - the kind of preparation that, if it is to be available at all, would be most likely offered in the comprehensive type post-secondary institution. This is perhaps the most compelling reason for opposing the spread of separatism.

The Independent Junior Colleges:

In looking toward the future, one of the big questions revolves around the fate of the independent two-year colleges. According to figures compiled by the American Association of Junior Colleges, there were 264 Independent Junior Colleges in 1967 (13:70). The

total enrollment for October, 1967 was just over 143,000 and there were about 11,800 faculty members (instructors and administrators). Almost half of these colleges (130) are found in nine states; these are shown in Table 1.

State	Number of Independent Junior Colleges
Georgia	10
Illinois	12
Massachusetts	16
New Jersey	11
New York	28
North Carolina	13
Pennsylvania	16
Texas	13
Virginia	11
9 States	130

INDEPENDENT JUNIOR COLLEGES IN NINE STATES

Table 1

The Independent Junior Colleges represent a valuable asset to the overall community college movement. With the rapid spread of public two-year colleges, there is a danger that they (the public institutions) will tend to become too similar to each other. This is a natural tendency, since institutions look to each other to find ways to inaugurate new programs and the like. The temptation to use the approaches and ideas "proven" by the experiences of another institution is very great, particularly for the public two year colleges. There is a greater reluctance to experiment with new courses and programs in a truly innovative fashion on the part of the public institutions because of how their supporting board and community would feel if it failed. It is more likely that an Independent two-year college, if funds could be solicited somehow, would be more willing to launch into experimental courses and programs with considerably less fear of what their "public" will think and do if the experimental project should be dubbed a failure.

Many educators in the two-year college field believe that the different level of accountability demanded of the Independent Junior College by their controlling boards could make the difference between establishing or not establishing an environment conducive

for experimentation and innovative practices in general. But only the potential is there, since the majority of Independent Junior Colleges have been experiencing financial difficulties for many years. It is common knowledge that they are caught in a squeeze - raising costs which demand increases in tuition fees while public two-year institutions with low or no tuition are sprouting up on all sides of them. A continuation of this trend, unless they find a new source of revenue, can very likely force the Independent Junior College into virtual extinction within the next ten years.

There are some faint signs that some methods of financially assisting these independent institutions may eventually be on the way in the years ahead. The American Association of Junior Colleges is supporting this point of view, as indicated by the following (1:7):

> The influence of the small private college is profound and must be protected as a precious possession of the democratic pattern of free enterprise. ... Both (meaning the public and private) are important and essential to the way the American educational system serves that way of living. More important, they complement and strengthen each other - the one moving quickly to keep abreast of current educational needs and demands of a large segment of society and, in the process, discovering new academic insights and methods; the other offering historical perspectives and a link with the accomplishments of the past, together with the proclivity to experiment, test, and try new things, and to see them multiplied. Together they consititute a dynamically reciprocal interplay of influence - one feeding, checking, and impelling the other.

A study conducted by the Council for Financial Aid to Education, The American Alumni Council, and The National Association of Independent Schools (14) has revealed that private support of the colleges and universities for the 1967-68 academic fiscal year had increased by 8.3 per cent over the preceding year. The total contributions was $1.57 billion. It should be noted that these contributions were by and large to four-year colleges and universities. It is reasonable to assume that the Independent Junior Colleges, as a segment within the college group, did not receive a proportionate share of these voluntary contributions. It seems clear that the Independent two-year colleges must derive financial subsistence by some other means.

It has been suggested by some that perhaps the best solution to this problem lies with changing the manner in which we support higher education. Public two-year colleges obtain funds from their local districts and state government in sums that are meant to accommodate certain physical facilities and a given number of students. Why not provide the funds in such a way that they go where the student goes? For example: It might be found that one year of two-year college education in a certain state in a given year breaks down to X dollars for the academic costs and Y dollars for the prorated expense of maintaining the physical plant. Therefore, the district and/or state would pay X + Y = Z dollars to the two-year college in which that student enrolls. Thus, it can be seen that public funds can be supplied to the student, who in turn exercises his choice of college. The same type of formula can be used in the disbursement of federal funds for higher education.

No one is predicting that the preceding proposal will be seriously considered, as far as this writer knows. Such a proposal would pose a threat to some of the public educators and it would very likely be subjected to a long period of controversy. Some half-type measures have been provided by several states, including Pennsylvania and New York. In these cases funds are provided to the student under the guise of scholarships and scholar incentive programs. These are far from adequate at the present time however, During the 1969-70 academic year, it was estimated that 245,000 New York State residents were provided a total of $69.9 million (15), which averages out to about $285 per student. It must be admitted that, when compared to the total cost of one year of education for the student, this is indeed a paltry amount. Although these are movements in the direction that could be of some benefit to the Independent Junior Colleges, the future of these institutions must be considered as being perilous at best, unless the public should decide to support them to the extent they finance their public institution counterparts.

The 6-4-4 Configuration:

During the past fifty years, education in the United States has followed patterns or configurations that serve to separate the public schools into partitions, i.e. elementary, junior high, and senior high. There have been several configurations within this pattern, (such as 6-6, 6-3-3, 6-2-4, etc.) but they all came up with a total of 12 years and then the college sequence

began. It seems that there are several good reasons to give serious consideration to another pattern, i.e. the 6-4-4 configuration. Let us examine them in some detail.

First of all, it seems to make good sense simply because of the now obvious trend toward replacing the high school diploma with the associate degree. Therefore, to break the sequence of grades at the point where most of the youngsters will go on for another two years doesn't make sense now The overall 14 years could be identified in the following way:

First 6 years:	Elementary School
Next 4 years:	Secondary School
Last 4 years:	Junior College

This approach obviously calls for some new thinking about what the secondary school would be in this arrangement. Furthermore, and of greater interest to us here, it would demand a thorough reworking of the community college idea. Like several of the other ideas presented earlier in this chapter, this suggestion would probably be unpopular with both the secondary school people (for one set of reasons) and the community college people (for still another set of reasons).

The idea would be unpopular with the secondary schools because it removes grades 11 and 12 from their jurisdiction. This means a reduction in the number of students, amount of money, and number of faculty members that would be subject to their control. The thought of making a change that would result in a reduced influence of a certain group of educators has the seeds of controversy built into it.

What about the community college group? They would not oppose it on the same grounds, since they would stand to gain in the number of students, faculty members and funds. It is reasonable to suspect the chief source of their opposition would have to do with an "image" problem not unlike the one analyzed in the first section of this chapter. The inclusion of grades 11 and 12, the last two years of the traditional high school, with grades 13 and 14, traditionally the first two years of college, would raise fears of "diluting" the college atmosphere with a high-school like environment. As mentioned earlier, there is a substantial amount of sensitivity to this type of influence on the part of many faculty members in the community college.

Besides providing a logical continuity for what is becoming the last four years of education for most youngsters, there are other advantages to the 6-4-4 proposal. A second advantage is the

salutary effect it could have on vocational education. This configuration will enable the schools to remove the great bulk of vocational education out of the lower grades (i.e. 10, 11, and 12) and place it in the last two years as the educational capstone for those youngsters deemed not likely to go on for baccalaureate degrees. Rather than force this kind of decision upon the student at or near grade 9 or 10, it can be delayed until the end of the 12th year. It would place all types of vocational education within the rubric of higher education since it would be conducted in the 4-year junior college.

The 4-year junior college idea is a natural answer to the Area Vocational School dilemma mentioned in an earlier section, which is the third advantage of this notion. To incorporate the Area Vocational Schools within the framework of a 4-year junior college would probably be the least difficult idea of all to implement.

The fourth advantage deals with the role of the junior college as a bridging institution. The traditional community college, in the two short years it serves its students, has difficulty in serving this bridging function for many of them. Four years would provide the junior college with a more realistic period of time to determine the optimum choices for each student - whether it be into the work world via an occupational program or into a senior college or university.

The secondary school, up to a generation or so ago, was the bridging institution for youngsters in our society - it pointed some toward going to work upon graduation by offering them occupational programs, while a minority were guided toward further education. That role for the secondary school is becoming obsolete with the popularization of the idea of 14 years of education for the majority of youngsters. The new role of the secondary school is that of a middle school - the link between elementary school and the proposed 4-year junior college.

In conclusion, the idea of a 4-year junior college has the following advantages:

1. The associate Degree would replace the high school diploma as the minimum educational certificate;

2. It would have a positive influence on occupational education;

3. It would enable the area vocational schools to be brought within the framework of higher education;

4. It enables the junior college to become a more effective bridging institution.

At the moment there are a few places where some semblance of this proposal is taking hold. These are some of the community colleges that are also serving as area vocational schools for their regions. In some of these institutions, the 11th and 12th grades are included, thereby taking on some of the characteristics discussed here. Complications have developed in certain instances because the secondary people in the Department of Education at the state level feel they are the ones to certify faculty and administrators. Therefore, much of the rigidity associated with the traditional secondary schools has crept into the new institution, which serves to decrease its popularity with the junior college people. In the long run, the 4-year college proposal would have its best chance of succeeding if the decision were made at the state level that grades 11 and 12 are in the junior college framework and not secondary school. This one decision would emancipate the new form of junior college from all of the rules, regulations, certification and other trivia associated with secondary education. Although such an idea may seem far fetched at the moment, perhaps one state will adopt this as a new form of its public education. Then the experiment would be on, for the rest of the nation to observe, and perhaps later, to adopt. After all, ideas much more radical than this have caught on in the past, so there is some hope.

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