This paper discusses six of the more important services the university could perform in the promotion and improvement of junior college technical education. Technical education is moving from the technical institute to the junior college, and the change is affecting both the training and the college. The research resources of the university could be of service in this transition by (1) directing research efforts in the teaching and administration of technical programs, (2) collecting and analyzing data on the characteristics of technical students, both sociological and academic, (3) developing, with the junior college, a model for continuous and longitudinal evaluation of the effectiveness of the technical programs, (4) helping in the design and development of new curriculums to keep pace with emerging technologies, (5) aiding in the modernization and up-dating of existing curriculums, in a three-way arrangement among industry, the university and the college, and (6) assisting in preparing programs of special relevancy to disadvantaged urban youth, keeping in mind their particular social and psychological deprivations. The college and the university should make a science of the design, development, conduct, and evaluation of junior college technical education. (HH)

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THE ROLE OF THE UNIVERSITY IN COMMUNITY COLLEGE TECHNICAL EDUCATION

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Abstract

This paper 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 arena. This mix of

technical education and the community college is creating effects

which are changing certain aspects of both technical education

and the public junior college.

Associated with this recent movement in technical education are

the roles being taken on by the universities. The six roles

identified and considered in this paper 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 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 the precedence had been established, it became easier for universities to become engaged 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. This paper takes the position 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.

A. 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. Moss (1:3)

proposed one research model which has considerable merit in

that it provides direction to research efforts in the area of

technical teacher education.

Using the Moss model as a guide for the direction of

research into technical teacher preparation, the activities

can be subdivided into the following broad categories:

1. Studies relating to the objectives of technical
   teacher preparation programs.

2. Studies dealing with the human resources from which
   potential technical teachers can be drawn.

3. Studies dealing with the varieties of technical
   teacher education programs that could be devised.

4. Studies aimed at developing effective methods
   of recruiting the right individuals into technical
   teacher preparation programs.

5. Studies designed to evaluate the educational
   experience being provided by ongoing technical
   teacher preparation programs.

Miller (2:30) proposed a system approach to designing

programs in technical teacher education. Based on his 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.

It can be seen that certain similarities exist between the
Moss and the Miller models. This 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 can
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 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

4

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 speciality 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 seems to this writer 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, and 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.

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 (5:7). 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 (5:7):

> 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 background to effective teaching in the technician 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.

B. Research

A list of suggestions for research and development

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

(6:19), 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 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 (7:690-730) (8:811-845)

(9:536-562), 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" (10). 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

of this study included the administration of several instruments

to each entering student in the four curriculums prior to

attending their first class session. 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 1968 and the final

administration of instruments will be conducted during

April and May of 1969. 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 types of programs. Other 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.

C. 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 that 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 Fig. 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

A MODEL FOR CONTINUOUS-LONGITUDINAL VALUATION

OF

COMMUNITY COLLEGE TECHNICAL EDUCATION

INPUT   TWO-YEAR COLLEGE   OUTPUT

Student characteristics
Academic

Instructors

graduates socio-
economic psychological
factors

Student characteristics
socio-psychological

Facilities

graduates: job mobility

Equipment

programs: relevancy
to human and
technological needs

Curriculum

Other
Environmental factors

programs: flexibility
and ability to change

graduates: continuation
of education and return
for updating and entry
into new technical
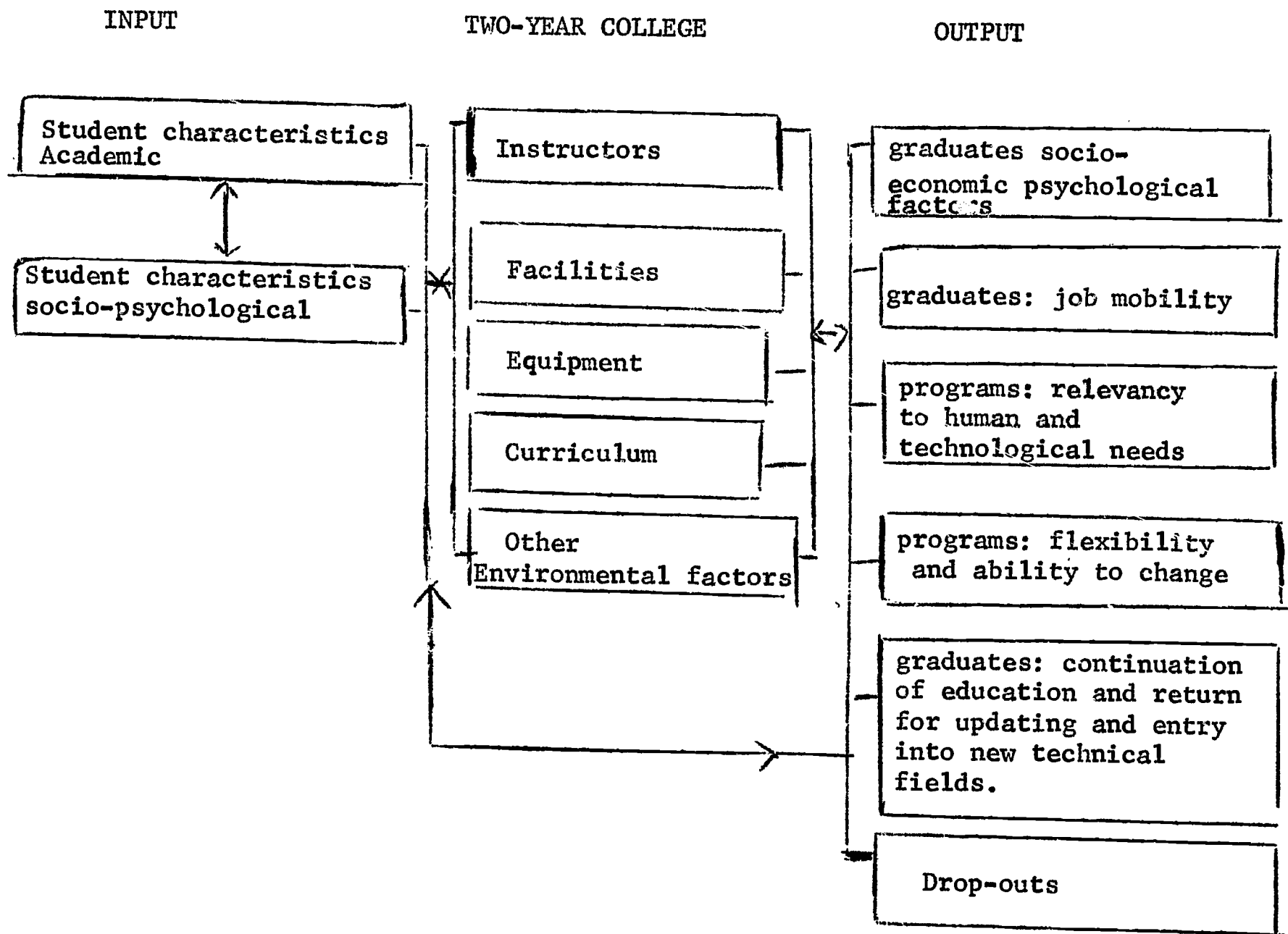fields.

Drop-outs

Figure 1

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.

D. Design and Development of New Curriculum:

The universities can also play a role in the design and
development of new curriculums. Nelson (11) 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. Roles of this type could
be assumed by the Center for Vocational and Technical Education at
The Ohio State University (12), as well as other government supported
research centers.

E. 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 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 has been recently designed and tested by this writer (13:17-21) (14:15-16), and its overall characteristics are shown in Fig. 2. This same model can also be utilized as an approach to the development of new curriculums.

F. 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

13

A MODEL FOR CONDUCTING STUDIES FOR
UPDATING EXISTING CURRICULUMS


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┌─────────────┐     ┌──────────────────┐     ┌──────────────────┐
│ Panel of    │ ──> │ Selection of Topics│ ──> │ Construction of  │
│ Experts     │     │ deemed appropriate │     │ Survey Instrument│
│             │     │ for the technician │     │                  │
│             │     │ for the next decade│     │                  │
└─────────────┘     └──────────────────┘     └──────────────────┘
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Administration of Survey Instrument

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┌──────────────────────┐     ┌──────────────────────┐
│ Group of Industrialists│   │ Groups of Technical  │
│ that relate to       │     │ Educators who train  │
│ technicians          │     │ technicians.         │
└──────────────────────┘     └──────────────────────┘

┌──────────────────────┐     ┌──────────────────────┐
│ Panel of Technical   │     │ Compilation and      │
│ Educators            │     │ analysis of Data     │
└──────────────────────┘     └──────────────────────┘

           ┌──────────────────────┐
           │ Design of updated    │
           │ Curriculum           │
           └──────────────────────┘
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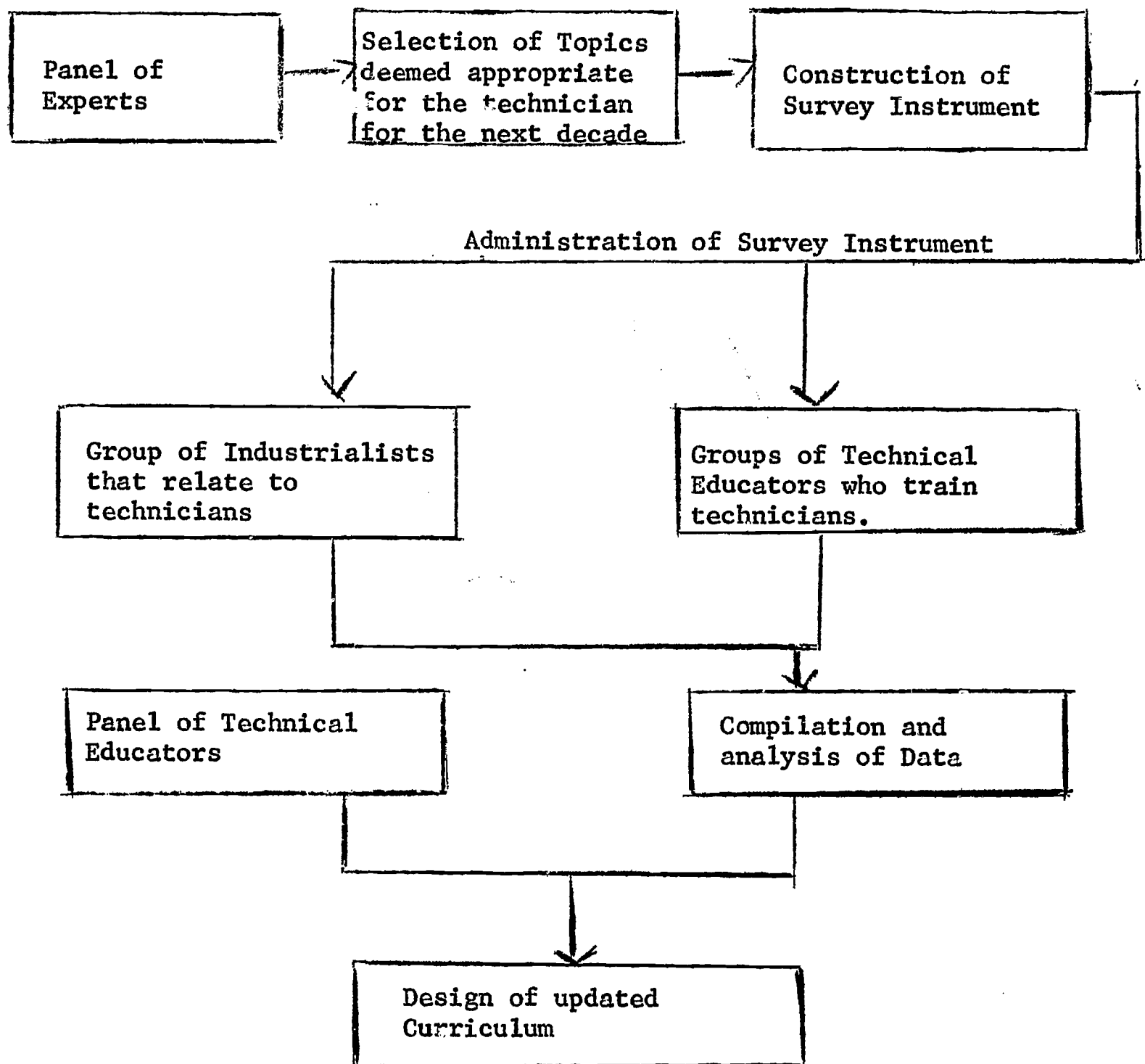
Figure 2

14

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 <u>needs of individuals rather than around the needs of industry.</u>

This reversal in the approach to the design of technical education programs 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. The plea being made here is that a systematic, continuous and longitudinal evaluation system be incorporated as an integral part of each experimental or demonstration curriculum. Let's make a science out of community college technical education program design and development. Again, the role of the university is clear—a cooperative agency in the design, conduct, and evaluation of these programs.

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. 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 aspect of this new variety of technical education is the increased involvement of the university. This paper has addressed

16

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.

Bibliography:

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

2. Miller, Aaron J. <u>Research Priorities in Technical Teacher Education: A Planning Model</u>. 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 <u>Technical Education News</u> (xxvii) January, 1968. New York: McGraw-Hill Book Company.

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

6. Koschler, Theodore A. "Checklist of Research Needs in Technical Education Programs." An article in <u>Technical Education News</u> (XXV, NO.2) February 1966. New York: McGraw-Hill Book Company

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

8. Webster, Harold Freedman, Mervin B. and Heist, Paul "Personality Changes in College Students." A Chapter in <u>The American College.</u>

9. Brown, Donald. "Personality, College Environments and Academic Productivity." A Chapter in <u>The American College</u>.

10. Gillie, Angelo C. and Kievit, Mary " 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 (Grant Number OFG-0-8-008007 2817 (010)) under the Grant Authority of P.L. 83-531 as amended P.L. 89-10.

11. Nelson, Arthur H. " A 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.

12. The Center for Research and Leadership Development in
    Vocational and Technical Education. The Ohio State
    University. Columbus, Ohio.

13. Gillie, Angelo C. "A New Approach to Curriculum Construction
    for Occupational Programs." A paper in the Research Bulletin,
    Fall, 1967 (Vol. XII No. 1): Graduate School of Education,
    Rutgers-The State University.

14. Gillie, Angelo C. "Planning Future Content of Electronics
    Curriculums." A paper in Technical Education News
    December, 1966 (XXVI No.2) New York: McGraw-Hill
    Book Company.