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NATIONAL PROGRAM DEVELOPMENT INSTITUTES IN TECHNICAL EDUCATION, SUMMER 1967, A COMPILATION OF SELECTED PRESENTATIONS AND INSTRUCTIONAL MATERIALS. LEADERSHIP 16.

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SELECTED MATERIALS GENERATED BY THE FOUR 1967 SUMMER LEADERSHIP DEVELOPMENT INSTITUTES IN TECHNICAL EDUCATION ARE PRESENTED. THE MATERIALS WERE COMPILED TO FULFILL A NEED FOR ADDITIONAL INSTRUCTIONAL MATERIALSTO BE USED IN CONDUCTING FUTURE STATE AND LOCALLY SPONSORED TRAINING ACTIVITIES AND INSTITUTES. COMMISSIONED PAPERS ARE--"A DESIGN FOR THE DYNAMIC LEADERSHIP IN VOCATIONAL EDUCATION IN THE DECADE AHEAD" BY RICHARD S. NELSON, "INTERMEDIATE AND LONG-RANGE PROGRAM PLANNING IN VOCATIONAL-TECHNICAL EDUCATION" BY JOSEPH T. NERDEN, AND "TECHNICIAN NEED SURVEYS" BY HERBERT RIGHTHAND. ALSO INCLUDED ARE--(1) 21 REPRESENTATIVE PAPERS ON INSTRUCTIONAL TOPICS DISCUSSED AT THE INSTITUTES CONDUCTED BY THE UNIVERSITY OF CALIFONRNIA AT LOS ANGELES, THE UNIVERSITY OF CONNECTICUT, UTAH STATE UNIVERSITY, AND MISSISSIPPI STATE UNIVERSITY, (2) A PRESENTATION ON THE ERIC SYSTEM DESIGNED AS A BASIC SCRIPT TO BE USED WITH TRANSPARENCIES WHICH CAN BE DUPLICATED FROM ACCOMPANYING ILLUSTRATIONS, AND (3) A SERIES OF VOCATIONAL AND TECHNICAL EDUCATION FACILITIES LAYOUTS PROVIDED BY THE U.S. OFFICE OF EDUCATION, BUREAU OF ADULT AND VOCATIONAL EDUCATION, AND DIVISION OF VOCATIONAL AND TECHNICAL EDUCATION, TO SHOW THE DIVERSITY OF FACILITY DESIGNS BEING IMPLEMENTED THROUGHOUT THE NATION. (HC)

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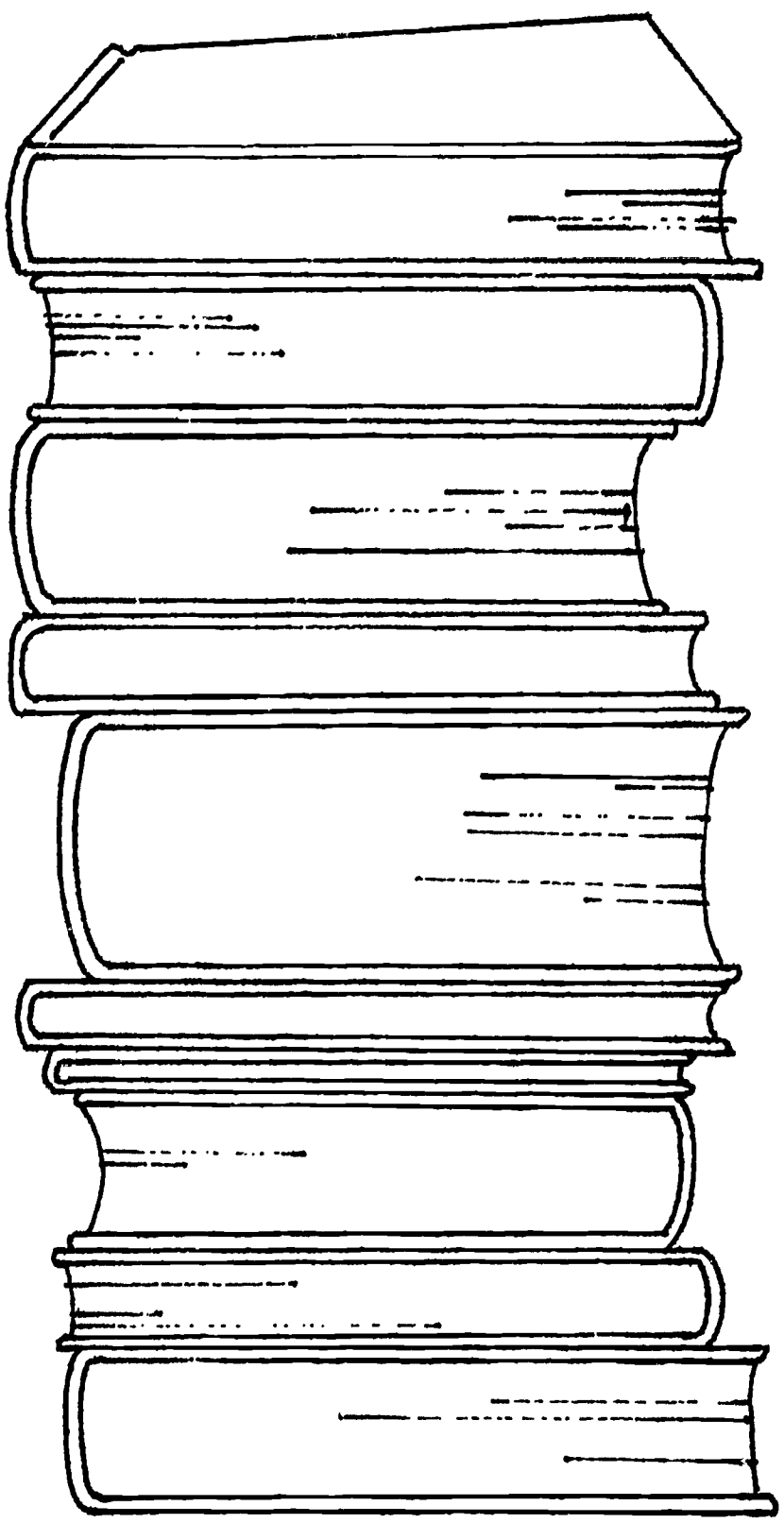
NATIONAL PROGRAM DEVELOPMENT INSTITUTES IN TECHNICAL EDUCATION. 1967.

A compilation of selected presentations and instructional materials.



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THE CENTER FOR VOCATIONAL AND TECHNICAL EDUCATION
OHIO STATE UNIVERSITY, 980 KINNEAR ROAD, COLUMBUS, OHIO

The Center for Vocational and Technical Education has been established as an independent unit on The Ohio State University campus with a grant from the Division of Adult and Vocational Research, U. S. Office of Education. It serves a catalytic role in establishing a consortium to focus on relevant problems in vocational and technical education. The Center is comprehensive in its commitment and responsibility, multidisciplinary in its approach, and interinstitutional in its program.

The major objectives of The Center follow:

1. To provide continuing reappraisal of the role and function of vocational and technical education in our democratic society;

2. To stimulate and strengthen state, regional, and national programs of applied research and development directed toward the solution of pressing problems in vocational and technical education;

3. To encourage the development of research to improve vocational and technical education in institutions of higher education and other appropriate settings;

4. To conduct research studies directed toward the development of new knowledge and new applications of existing knowledge in vocational and technical education;

5. To upgrade vocational education leadership (state supervisors, teacher educators, research specialists, and others) through an advanced study and in-service education program;

6. To provide a national information retrieval, storage, and dissemination system for vocational and technical education linked with the Educational Research Information Center located in the U. S. Office of Education;

7. To provide educational opportunities for individuals contemplating foreign assignments and for leaders from other countries responsible for leadership in vocational and technical education.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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LEADERSHIP 16

NATIONAL PROGRAM DEVELOPMENT INSTITUTES IN TECHNICAL EDUCATION

Summer 1967

A COMPILATION OF SELECTED PRESENTATIONS AND INSTRUCTIONAL MATERIALS

Compiled by: A. J. MILLER

I. E. VALENTINE

The work presented or reported herein was performed pursuant to a grant from the U. S. Office of Education, Department of Health, Education and Welfare.

THE CENTER FOR RESEARCH AND LEADERSHIP DEVELOPMENT
IN VOCATIONAL AND TECHNICAL EDUCATION
THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO 43212

FEBRUARY 1968

PREFACE

The National Program Development Institutes in Technical Education represent a continued thrust in leadership development by The Center for Vocational and Technical Education. A series of leadership development institutes in technical education was conducted in 1966 which offered leadership training to 195 participants from forty-six states. The National Program Development Institutes in Technical Education were conducted during the summer of 1967 as a continuation of this previously established effort, and brought together 122 leaders and potential leaders in technical education from forty-three states, Puerto Rico and Canada. These participants attended one of four coordinated institutes designed to further develop the participant's technical education program leadership potential.

The consortium of these four institutes was coordinated through The Center for Vocational and Technical Education, The Ohio State University. We wish to gratefully acknowledge the following host institutions which conducted the institutes and their respective institute directors: The University of California at Los Angeles, Melvin L. Barlow and Richard S. Nelson; The University of Connecticut, W. Howard Martin; Utah State University, Neill C. Slack; Mississippi State University, Eugene F. Mitchell and E. B. Moore.

While a variety of materials were prepared for use in the institutes, project evaluation revealed the need for additional materials to be prepared and distributed to participants and institute staff for use in conducting future state and locally sponsored training activities and institutes. To fulfill this need, the project staff compiled the materials presented in this publication.

Recognition for the preparation of this document is due the following staff members: Aaron J. Miller, project director; Ivan E. Valentine, project coordinator, and Don R. Herring, research associate.

Robert E. Taylor
Director, The Center

INTRODUCTION

The materials presented in this publication are selected instructional materials and presentations generated by the four institutes. While all presentations at the various institutes were worthy of publication, only a few representative papers on each instructional topic discussed are presented in this document. The information in this publication is divided into seven parts.

Part I consists of three commissioned papers. The titles and authors are as follows:

A Design for the Dynamic Leadership of Vocational Education in the Decade Ahead
Richard S. Nelson

Intermediate and Long-Range Program Planning in Vocational-Technical Education
Joseph T. Nerden

Technician Need Surveys
Herbert Righthand

Parts II-V consist of selected papers presented at the four institutes. Part II contains papers from the Utah Institute; Part III, the Mississippi Institute; Part IV, the Connecticut Institute; and Part V, the California Institute.

Part VI consists of a presentation on the ERIC system, and is designed as a basic script to be used with transparencies which can be duplicated from accompanying illustrations.

Part VII consists of a series of vocational and technical education facilities layouts which have been selected to show the diversity of facility designs being implemented throughout the nation. The project staff is grateful to the U. S. Office of Education, Bureau of Adult and Vocational Education, Division of Vocational and Technical Education, for providing the original facility layouts for reproduction and for assisting in the identification of unique design features.

A. J. Miller,
I. E. Valentine
and
D. R. Herring

Contents

PART 1

COMMISSIONED PAPERS

TECHNICIAN NEED SURVEYS

Herbert Righthand*

Education is an instrument of society. As such, it seeks to serve the needs of students.

Vocational education, to be meaningful and valuable to the student, must be based on the needs of industry and business. It is through the analysis of the labor market and the interests and abilities of students that vocational-technical education can provide effective programs.

As a result of technological changes and automation, surveys of industrial and business occupational requirements are extremely vital to the field of technical education. Also of vital concern are the occupations in the health and data processing fields and the changing content in other technician fields.

OBJECTIVES

The general objectives of a technician survey determine the scope and techniques of the study. A first step must therefore identify the purpose of the study and possible action resulting from the findings.

Surveys may be conducted in order to consider the following:

- Desirability of the construction of a technical institute.
- Addition of a technical program to a community college.
- Addition of new technologies to existing institutions.
- Modification of existing technologies to meet current needs.
- Need for adult technical programs.

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*Dr. Righthand is chief, Bureau of Vocational Services, Hartford, Connecticut.

- Placement opportunities.
- Occupational data for purposes of vocational guidance.

The above general objectives for the conduct of a survey are not all-inclusive, nor are they mutually exclusive. Studies based on one or more of these objectives may provide significant data applicable in other areas of concern.

SPECIFIC GOALS

As a second step in the development of a survey, it is necessary to delimit the study by identifying specific goals. For example, the available student population may not be included in a survey when the objectives of the study are primarily for up-dating curriculum. Certain decisions must be made within the framework of the general objectives, and in consideration of the funds and manpower available for the study.

Some of the variables which need definition in the design of a survey are listed below.

Scope of Study

Should the survey be a community or a statewide analysis? A survey intended to provide information applicable to the location and construction of a technical institute must consider local student supply and job opportunities. A survey intended to develop a master plan for the state in terms of technical education needs would consider the state as its unit of study.

If the objective is a survey of emerging occupations or changing occupations, the approach may be through a survey of a specific industry; or a survey may seek information in the health field or in nuclear industries. Another approach would be to study an occupational cluster; for example, data processing occupations. This study would cross over industrial and geographic lines. In some instances, regional studies involving neighboring states or adjacent cities are necessary, particularly where highly specialized technologies with limited intra-state needs are being considered. In some cases, a major employer may be located just across a state border and should be considered in the survey.

Content of Study

A survey may include present vacancies, projected job opportunities, opportunities for women, student availability and specific interests of qualified students, entry requirements, salaries, upgrading, job analysis, technician mobility, institute and community college attrition rates, output of technicians from formal education programs, replacement factors, curriculum implications, and facility and equipment requirements. These are not complete in terms of all related areas that affect technical education and could be obtained from a survey. However, a survey need not include all of these variables. The choice of areas to be studied will depend on the general objectives and the research limitations of the survey. Another vital factor in delimiting the areas to be studied should be the availability of this data from previous state or national studies.

UTILIZATION OF AVAILABLE DATA

In order to narrow the scope of the survey, it is essential that the researcher be acquainted with the available information. The bibliography included in this paper reflects a partial listing of publications and studies dealing with surveys. Since all findings are not applicable to the needs of a specific study, it is sometimes desirable to replicate a study. However, blind replication without the knowledge of the existing available data, does not provide a meaningful study. When job descriptions and analyses are available, there is usually little justification for repeated studies of the same occupations.

The researcher must be aware of sources of information and make use of them in his survey. Some of these sources are identified below.

United States Department of Labor

The Bureau of Labor Statistics provides excellent national data dealing with employment projections. In addition to national releases, the Bureau of Labor Statistics issues information on the labor market of a federal region. These are available through the regional office of the Bureau of Labor Statistics.

The United States Department of Labor's Manpower Administration, Office of Manpower Policy, Evaluation

and Research, publishes an annual report of manpower activities and projections. This unit also releases monographs dealing with specific occupational topics.

The Bureau of Employment Security has published documents dealing with techniques of conducting area skill surveys and long-term manpower projections.

United States Department of Commerce, Bureau of the Census

This bureau provides census data reporting population trends and numbers employed in specific occupations. This report provides the yardstick against which projections can be measured.

United States Department of Health, Education, and Welfare, U. S. Office of Education

The Bureau of Adult and Vocational Education, through its staff and publications, can provide data concerning the activities of other states in the development of technical programs. Curriculum materials are available from the appropriate divisions and branches. The Bureau of Research identifies research studies which may have relevance to the projected survey.

State Department of Labor

The materials available from state agencies may vary from state to state but must not be overlooked. Results of area skill surveys, statewide studies, and listings of job shortages may all provide valuable data for a technician study.

Industry

Frequently, job market studies are conducted by private organizations, manufacturers' associations, the chamber of commerce, and other organizations. The data made available through these efforts may be extremely valuable to a survey.

Education

The survey efforts of vocational educators are usually filed with The Center for Vocational and

Technical Education of The Ohio State University, and the titles and sources may be obtained from the university or the Center. Another source of reference materials is being made available by the development and compilation of data through ERIC. Professional educational journals represent still another possible source of information.

DETERMINING OCCUPATIONAL NEEDS

Advisory Committees

Careful planning and cooperation with industry is necessary to determine current and projected needs. As a first step, it is suggested that an advisory committee be formed. This advisory committee, consisting of representatives of industry, labor, and of state and local agencies can: 1) Provide direction in the identification of the target for study; 2) assist in the development of techniques; 3) provide the necessary support in obtaining cooperation from business concerns.

Sampling

The identification of the target for study will depend on the general objectives. A survey may concern itself with manufacturing companies, hospitals, a specific industry, such as a chemical plant, or possibly all businesses employing data processing personnel. Where it is possible, it is desirable to survey all institutions identified as the survey population. In those cases where the number is large, random selection of the companies to be surveyed should be made, and findings should then be projected to cover the whole population. In some cases, it may be found that a few large firms employ the vast majority of a specific occupational category. The survey of these concerns can provide a conservative estimate of the job market.

Survey Techniques

There is no one method for obtaining the data from the sample. Although the number of currently employed and the number of present vacancies can be obtained with some degree of accuracy, projections of needs are based on various forecasts and represent crude estimates of the labor market picture. Different approaches are used to obtain the essential

data. All involve some judgmental decisions.

Mailed questionnaires--The mailed questionnaire represents one of the simplest techniques but presents the problem of limited and possible biased returns. The effectiveness of this method is increased when manufacturers' groups or professional organizations actively sponsor the survey.

Another technique for improving this approach to data gathering is to conduct an intensive follow-up by telephone, or, in some cases, by personal visits. This should increase the number of returns and improve the sample. If no significant differences in the pattern of responses are found between the first returns and the follow-up, some researchers interpret this as indicating that there is no bias reflected in those who respond and that it is safe to extrapolate the data. This, of course, depends on the size of the responding sample, since it still could be true that the concerns who continue to disregard questionnaires may represent those with no serious labor shortages.

Structured interviews--A technique which can overcome to a degree, some of the problems encountered in the use of mailed returns is the structured interview. The personal interview approach is time-consuming and expensive to use. One of the main advantages to this technique is that there are few refusals to meet with an interviewer, and a much greater return is obtained. This method provides both the interviewer and employer with an opportunity for the interchange of ideas and can clear up possible misunderstandings concerning the items in the questionnaire or the general objectives of the survey. An incidental advantage of this method, if technical institute or community college interviews are used, is that vital contacts are made which can serve as good placement avenues as well as establishing a basis for future relationships.

Statistical approaches--The above techniques depend on the knowledge and objectivity of the employer. Although many companies have well-developed manpower forecasts and provide as accurate a prediction as is feasible in a changing society, there are many firms whose estimate of future needs is based on limited knowledge and thought, and the acute immediate needs sometimes tend to influence the employer's projections. Statistical techniques, based on current data, tend to avoid this problem.

Labor market projections are sometimes made on the basis of national forecasts, which are then applied with appropriate modifications to local or state situations. Extensions of existing job market data may be made by mathematical extrapolation. However, these extensions of data still involve a great many judgmental factors, and the mathematical techniques may provide a false sense of exactness. National data provide a good basis for reinforcement of local findings. However, whether the local community represents the employment pattern and growth pattern of the nation is more difficult to ascertain.

Technician-engineer ratio--The use of a technician-engineer ratio appears to be a simple approach but is based on a theoretical judgment--the appropriate number of technicians for each engineer. What this ratio should be varies from field to field and from researcher to researcher. Existing census data can be obtained and observed for the growth trend. If the assumption can be made that this ratio growth will continue in the same manner and that the ratio will stabilize, then the projected engineering needs times the technician ratio can provide an estimate of future needs.

Summary

The area of forecasting is not an exact science. The greater the understanding is of the techniques and their advantages and disadvantages, the more effective the survey is. These methods are not, of course, independent and can be combined in many ways. An excellent outline of procedures for the conduct of a vocational survey is provided by the Florida State Department of Education[1]. General descriptions of labor market analyses are provided by the U. S. Department of Labor in 1965[2] and 1966[3]. Specific

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[1] Florida State Department of Education, Division of Vocational, Technical and Adult Education, Fact Finding in Vocational Education (Tallahassee: the author, 1964). (Bulletin 70H-7).

[2] U. S. Department of Labor, Bureau of Employment Security, Area Skill Survey (GPO, November 1965). (BES No. E-252).

[3] U.S. Department of Labor, Bureau of Employment Security, 1966 Report of the Secretary of Labor on Manpower Research and Training Under MDTA. Part IV (GPO, 1966).

applications of some of the approaches described previously are explained by the New York State Department of Labor[4], Kavieff[5], and Righthand[6].

Data Collection

The plans for the collection of the data should be developed carefully and placed on a time schedule.

A structured questionnaire should be developed and used, whether a mailing or interviewing technique is used.

The form should be simple in format and contain the data essential to the objectives of the study.

The questionnaire should lend itself to statistical treatment and data processing.

The terms used should be defined in an instruction sheet. These instructions should also give necessary directions for completing the questionnaire.

Interviewers should be properly oriented to the objectives and techniques of the study. They should be considerate of an employer's busy schedule and should arrange for interviews at the employer's convenience.

The questionnaire and the interviewer should make it clear that the company's information will be treated confidentially.

A cover letter should accompany the questionnaire. This letter should spell out the objectives of the study and identify the sponsoring groups.

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[4]New York State Department of Labor, Division of Research and Statistics, Technical Manpower in New York State. Volume I (Albany: the author, December 1964). (Supplement B).

[5]Melvin C. Kavieff, Report of Survey of the Need for Technicians in the Automotive Manufacturing Industry in the Detroit Metropolitan Area (Detroit: Board of Education, School District of the City of Detroit, 1962).

[6]Herbert Righthand, Connecticut's Need for Technicians 1963-1973 (Hartford: Connecticut State Department of Education, Division of Vocational Education, November 1964).

Questionnaire Content

Although the content of the questionnaire will vary, there are certain factors that should not be overlooked in developing a questionnaire. Some of the content of questionnaires and some of the techniques for handling the data acquired are listed below.

General format--The questionnaire should identify the organization responsible for the survey, the title of the survey, and should also indicate the confidentiality of the questionnaire.

General information--Provision should be made for the company's name and address, type of business, name and position of person being interviewed or filling out the form, name of interviewer, and date.

Job title--The form must be structured so that the firm's job title is identifiable in terms of DOT job classifications. A clear definition of technician should be used in the study. (See Schaefer and McCord, 1963[7].) It is important to provide or obtain a job description since job titles used in industry do not always reflect the duties.

Number employed--This statistic is essential for computation of replacement needs. Occupations employing large numbers will need many replacements so that even without expansion, there exists a steady market for graduates.

Present vacancies--This statistic provides a picture of the current labor problems. In a tight labor market, these shortages may be carried over to future years. Information concerning present vacancies provides a basis for planning short-term evening courses which might help to alleviate the shortages.

Replacement needs--This information may be obtained from employers but will generally signify turnover rather than replacement. An electronic technician leaving Company A to work for Company B, in the same capacity, will usually be identified by

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[7]Carl J. Schaefer and Robert E. McCord, "The Technician: Some Definitions," Technician Education Yearbook 1963-1964 (Ann Arbor: Prakken Publications, 1963).

Company A as a needed replacement. Thus, as long as the employee stays in the occupation in the general area of the survey, no shortage is being created.

Replacement needs are based on workers who leave because of sickness, death, retirement, or for another type of job assignment. Percentages estimating the replacement or separation rate have been developed by various studies. For a discussion of these rates, see New York State Department of Labor[8], Kavieff[9], and Righthand[10].

Expansion needs--The employer is asked what he foresees as the additional personnel needs for a specific occupation over a period of time. It should be clear to the employer that his projection should or should not include present employees and present vacancies. This will depend on the questionnaire but should be clearly explained.

Annual needs--On the basis of the sum of the replacement needs plus the sum of the expansion needs, a total manpower need can be established for the period of study. By dividing this by the number of years of the projection, an annual need figure may be estimated.

Projection of Data

The data, if based on a sample, may now be extended to cover the population by increasing the findings in proportion to the size of the population-sample ratio.

Technology Groupings

Since educators are interested in the findings from a curriculum viewpoint, it is possible to build a coding system which would assign the various job titles to the appropriate technology as taught in appropriate institutions. This technique is particularly effective when an interviewer with a

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[8] Ibid., p. 8.

[9] Ibid., p. 8.

[10] Ibid., p. 8.

knowledge of institute curriculum is involved in getting information. The resulting data can then be interpreted in terms of the need for expanding, contracting, or modifying existing technologies.

Level of Education

The term technician may mean many things to an employer. One employer classifies all professional workers below a Ph.D. level as technicians. Another employer includes machine operators as technicians. The questionnaire can help define technician by asking the employer to identify the desired educational level for the position listed.

Technician Input

The data obtained from a study of industrial needs must be properly interpreted before school planning is started. The number of technician graduates from public, private, and industrial programs must be included in the total study. It is conceivable that the demand is being met by the supply. It is the net demand that should be used in the analysis of educational changes.

Other Data

It may be desirable to assess the employer's attitude toward the employment of women. Evidence of openings for women in technical fields may assist technical educators and vocational counselors. Entry salaries may also be included in a survey, although these are not always easy to obtain. Their value is that they might indicate jobs in which salary rates are low or are below prevailing rates, and these jobs might not attract enough students to justify a program.

The items listed do not cover all areas of concern, nor is it deemed necessary to cover all those identified. The survey should be developed within the limits, capabilities, objectives, and time available.

SOURCE OF STUDENTS

This phase of a technician survey is often omitted or conducted as a separate study. The existence of job openings does not in itself justify the construction of a new technical institute or the

addition of a new program to an existing institution.

It is not difficult to obtain the size of graduating classes in the area being studied, nor is it difficult to project the graduating class size to the period when the new school or new program may be operative. These facts are usually available through state departments of education.

Attrition rates must be applied to the projection of grade enrollments as well as the enrollments of the two-year colleges. The combined information can provide a basis for making a judgment as to whether a school of sufficient size and scope is feasible.

The most difficult area to determine is the number of graduates expected to apply at the institute and the number of these expected to meet entrance requirements. By surveying the areas served by existing institutes, a percentage of the number of graduates entering two-year colleges can be obtained. This percentage can then be applied to the area under study.

Student questionnaires are usually not too reliable and tend to be inflated. However, such student surveys, when properly structured, may provide the areas of interest of the high school graduates. It is known that not all technologies offered have the same drawing power. Bennett[11] provides an illustration of a study to determine the feasibility for the construction of a technical institute. Not published in this document, but obtained through survey, is information concerning the specific interests of the students. The industrial needs of the area were previously identified through various studies.

SURVEY EXPERTISE

There is little doubt that the personnel of the U. S. Department of Labor and the state departments of labor have the best machinery and "know-how" in the area of manpower studies. A thorough technician study

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[11] Robert E. Bennett, A Report of a Study to Determine the Potential Enrollment in the Proposed Technical Institute to be Located in the Orange-New Haven Area (Hartford: Connecticut State Department of Education, Division of Vocational Education, November 1966).

should depend on the specialized knowledge of the educator. Ideally, the study should be a concerted effort, involving industry, organized labor, and local schools. In some areas, there may be university staff familiar with occupational studies, in which case the surveys may be conducted or coordinated by them. Private research firms are growing and may also be able to provide a service in the conduct of a survey.

IMPLEMENTATION

Technician surveys should have a practical significance, and their findings should be sought by educators and used by educators for planning. Surveys involve many groups and many people, and it would be unfortunate if, after all the efforts were expended, the findings were not utilized.

Continued studies provide improvements in techniques for projecting human behavior and societal changes even though it is a difficult task. The accumulation of manpower and educational statistics provides a better base for conducting future studies. Although estimates may not be exact, they still provide a better base for planning than that offered by whim, fantasy, or hunch.

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A DESIGN FOR THE DYNAMIC LEADERSHIP OF VOCATIONAL EDUCATION IN THE DECADE AHEAD

Richard S. Nelson*

From every avenue in American life, our attention has been called to the importance of strengthening the quality of vocational education if we are to maintain America's position as a leader in the world of work. Certainly no period in the history of mankind has been as revolutionary as the past score of years. Knowledge doubles every ten years, or perhaps eight, and automation has brought with it new ways of work and new points of emphasis in the manner in which work is to be done. Greater stress is being placed upon the importance of education as a background for achieving the highest level of production and utilizing to the fullest extent the human resources of our nation.

The Vocational Education Acts, which have guided our education in these areas, were inaugurated fifty years ago through the enactment of the Smith-Hughes Act. Except for the introduction of the George-Barden Act in 1946--and a few minor changes made possible through the National Defense Education Act--very little has been done to improve the legislation in this important area.

There is a critical need to develop more effective industrial education programs which can provide citizens with a knowledge and appreciation of industry and contemporary technology. There is a critical need to prepare a work force with the skills and knowledge required by an expanding and ever-changing technology. The discovery explosion in industry has made new demands on industrial education in the schools of the nation. Industrial practices have shifted from their pattern of slow evolution to the explosive tempo of discovery--discovery of new materials, new products, new designs, and new production techniques. In this explosive atmosphere where job and occupation requirements change by the day rather than by the year or decade, we must review and update the philosophy and organization of industrial education.

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*Mr. Richard Nelson is chief, Bureau of Industrial Education, State Department of Education, 721 Capitol Mall, Sacramento, California 95814, May 1967.

A review of the history of industrial education reveals an early concern for this integral part of the total program of education. The minutes of the National Society for the Promotion of Industrial Education, October 1906, included this statement:

> The need for industrial education in the United States has become a social and industrial question of the first magnitude. It is not only a question that critically affects our material prosperity as a nation, but one that vitally concerns the well-being of society as a whole.

In February 1916, a report of the United States House of Representatives, describing vocational education, stated:

> It is especially designed to prepare workers for the more common occupations in which the great mass of our people find useful employment. As here used, it means that form of education whose controlling purpose is to give training of a secondary grade to persons over 14 years of age for increased efficiency in useful employment in the trades and industries . . .

Also contained in the report is a discussion concerning young people whose aspirations are denied in an educational world that prepares only for college. They leave school with inadequate general education and with no special training to fit them for work. Vocational courses are therefore needed to attract and hold school pupils who now leave because they are unable to obtain suitable preparation for gainful employment.

Representative Dudley M. Hughes, co-author of the Smith-Hughes Act, said in favor of passage of this bill:

> The greatest resource of any nation is the undeveloped skill and vocational possibilities of its population. Vocational training is especially needed to prevent waste of human labor, which is the most destructive form of extravagance of which a nation can be guilty.

At the Philadelphia Centennial Exposition in 1876, a European school exhibit attracted the attention of American educators. The exhibit

consisted of a series of project pieces in wood and metal. As a result, the St. Louis Manual Training School was developed and widely copied, providing a sequence of courses including drawing, woodwork, patternmaking, foundry-forging, and machine shop skills. These courses were offered in addition to English, mathematics, science, history, and literature.

After a few years of change and adjustment, the American manual training program had its start, and the term "industrial arts" was adopted in the public schools in 1928. By 1930, the name had gained national acceptance.

The Vocational Education Act of 1963--Public Law 88-210--was signed by the President on December 18, 1963. The act stresses the need for programs of high quality--available to all persons of all ages--in all communities. It also emphasizes the need for making the training suitable to the needs, interests, and abilities of students and being realistic in terms of present and anticipated employment opportunities. This act gives us the authority and flexibility to fill the gaps we have long recognized.

What can this act do for industrial education? It can make substantial funds available to increase the effectiveness of our industrial education programs, and more importantly, it can make possible the broadening of the definition of vocational education. The traditional categorical allocations of funds to the fields of agriculture, business, trade and industrial, and home economics are not provided in this act.

The broad definition of vocational education may be summarized as follows:

- Occupational education given in schools or classes, under public supervision and control, and
- Conducted as a part of a program designed to fit individuals for gainful employment in recognized occupations, but
- Excluding those occupations that require a baccalaureate or higher degree.

This act also makes possible the development of new programs of vocational education through grants for research, pilot, and demonstration projects.

A mid-60's statement about vocational education recognizes that it continues to be a vital part of the educational, social, and economic life of the state and nation. It also expresses the idea that human resources and natural resources are the concern of the nation, both in defense and economy. To recognize clearly these elements in this year of change necessitates a statement of change, a philosophy of change, and an adjustment to change. In a nation where employers search for occupational proficiency and employees seek occupational opportunity, it is the undeniable task of vocational education to provide job and occupational training--a task which has and can be done efficiently in spite of the greatness of the challenge.

To understand the framework within which industrial education is meeting this challenge, it is necessary to describe briefly the areas in which it operates. Traditionally, there are two major areas--industrial arts education and trade and technical education.

Industrial arts education is that phase of industrial education which deals primarily with developing certain habits, attitudes, and abilities desirable for all citizens of an industrial society regardless of their vocations. Though industrial arts education has basic vocational value for those who will become industrial workers, it has been developed in the schools as a phase of general education.

Trade and technical education, on the other hand, has its historical roots in apprenticeship, and its principal goal is to prepare the student for gainful employment in recognized industrial occupations. Like industrial arts education, trade and technical education obtains its instructional substance from industry, but the objective is to acquire the skills and abilities necessary for successful employment in an industrial occupation.

Within this framework, there are four fundamental considerations to guide the activities of industrial education:

1. Industrial education should be an integrated program with two distinct purposes--general education and the preparation of students for gainful employment in industrial occupations.

2. Industrial education is the principal program in American education that should emphasize

the position and potential of industry in our society--a role both industrialists and educators should clearly recognize.

3. The major objectives of industrial education--those of general education and occupational preparation--should be paramount in the minds of those establishing industrial curriculums.

4. There is evident need for constant vigor in keeping philosophy, organization, subject matter, facilities, and teacher selection and preparation in accord with the contemporary industrial tempo.

These considerations, or guidelines, indicate that there are major and minor principles involved in providing vocational education opportunities for youth and adults of the nation.

Vocational educators have made certain assumptions which include the following:

1. Vocational education is necessary to conserve and develop both human and natural resources.

2. Vocational education is needed to meet the increased demand for skilled workers.

3. Vocational education protects our state and national prosperity.

4. Vocational education is an integral and vital part of the total educational program.

5. Vocational education is necessary to prepare youth and adults for participation in a contemporary industrial society.

6. Vocational education must be based on the advice and counsel of representatives of the employer-employee community being served.

A current trend that has important implications for vocational education is the modern manifestation of the centuries-old shift from men to machines. Essentially the same trend which ushered in the industrial revolution more than 100 years ago and its development in recent years has added the words "automation" and "cybernetics" to the dictionary. This new technology, with its resulting dislocations that reverberate through society, a problem second only to the problem of securing peace in the world,

has implications for all workers, present and future, which vocational educators regard as of the utmost significance.

The challenge is constant and formidable and is an insistent impetus to further achievement. The spiraling and ever-changing requirements of the old occupations and the unsatisfied demands for proficiency in the new occupations leave no room for complacency.

Vocational education is an integral part of the total program of public education and contributes significantly to the major objectives of education.

Industrial educators in the public schools must take a "new look" at their responsibility and design an educational program that is second to none in preparing the quality and quantity of industrial manpower required by our economy. To do this, it appears to me that the following points must be given prime consideration:

1. New occupations are being born almost every day. These new occupations appear to be in clusters, centered around a major core of technical understanding, such as digital computers, automatic controls, space technology, electro-mechanics, plastics, support engineering, systems, manufacturing, tooling, construction, nucleonics, health occupations, and others. Each of these clusters has definite job requirements. The education and training required must be designed and programmed around a core of technical understanding with special application in the area of job opportunity at the entry level.

2. The concept of the "team approach" in modern business and industrial manpower planning is becoming a reality. Educators, in planning the reevaluation of vocational education opportunities in their schools, must be cognizant of this concept. This "team" is composed of the operator, semi-skilled worker, skilled worker, technical support person, engineer, scientist, supervisor, and manager. Care should be taken, however, to maintain a proper balance of occupation-centered curriculums that prepare persons for employment at the entry level or for advancement for higher positions. Much emphasis

has been placed on various "technologies" and the "engineering technician." Extensive and dependable information and data indicate that future industrial manpower needs are not highlighted by the need for engineers and engineering technicians. Rather, the need appears to be for a "well-trained team" that understands the concept of automation, mechanization, industrial systems, and technical health centers, and that possesses members with specific skills required to play their roles as part of the team.

3. There is a need for a better understanding of the interrelationships of the total educational continuum which is preparing youth and adults for gainful employment in the industrial community. Identity should be given to the efforts of the industrial arts courses in the junior high schools, the occupational preparation and pre-technical courses in the high schools, the trade and technical curriculums in the community junior colleges, and the emerging adult education centers.

4. There needs to be an assessment of all vocational education programs offered in the public schools to insure quality assurance. Within the next three years, each school offering programs in these areas should obtain extensive and dependable information upon which to base the decision to establish, to revise, or to continue each curriculum.

5. Upon completion of the "determination of need" phase, serious consideration should be given to the kind of curriculum that should be developed and whether it should be offered in the high school, in the junior college, or at the adult center. Specific courses should be identified in one of the following five categories:

   a. Industrial arts curricula

   b. Occupational preparation curricula

   c. Pre-technical curricula

   d. Trade curricula

   e. Technical curricula

6. The number of extension classes for employed workers should be doubled or tripled in the next three years. These classes should be specifically designed for each of the occupational groups, and instructional materials should be developed to insure adequate, current coverage of the skills and knowledges required by their changing industry demands.

Our industrial society is founded on an inheritance of a wealth of industrial skills and technical information. We have the opportunity to utilize this inheritance and to profit from it, and also the responsibility to preserve and to contribute to it. The extent of the benefits to be derived depends largely upon the development of efficient industrial producers and of informed consumers of the products and services of industry.

This is accomplished in a number of ways, but the public school plays a leading role, specifically through the program of vocational education and generally through the rest of the curriculum. The preparation of a well-qualified industrial worker begins with his early educational experiences, which should include two or more years of vocational education before employment. After employment, additional vocational education courses and training provided by industry will be necessary. Those providing vocational education at the various stages should plan and work together so that the total educational effort is effective and efficient and forms a single integrated program.

We find in these times that educators occasionally turn upon educators. We have been too complacent and have felt that what has happened in the high school, the junior college, or the adult education centers was of small importance as long as it did not affect us. This is not true--we cannot afford to allow the educational system to be attacked piece by piece. I believe that we have an obligation in these times to remember more than ever that we must be constructive in our thinking and in all of our professional activities. We must be program builders, not program wreckers. One person put it this way:

BUILDER OR WRECKER?

I watched them tearing a building down,
A gang of men in a busy town,
With a ho-heave-ho and a lusty yell,
They swung a beam and a side wall fell.

I asked the foreman, "Are these men skilled
As the men you'd hire if you had to build?"
He gave a laugh and said, "No, indeed,
Just common labor is all I need."

It is generally agreed that vocational education is an application of the basic concept that the individual, if he is to function effectively in a democratic society, needs to be able to think, to act, to contribute, and to make decisions about the future of the culture. Its principal concern has been to acquaint all members of the industrial society in which we live with the salient features of that society, to teach them to participate effectively in it as consumers, to prepare them for industrial employment, and to safeguard their employment by the development of skills and knowledges of given occupations.

The importance of vocational education to the individual student cannot be over-emphasized. Specific and salable occupational competency is the surest guarantee he can have of getting his toe into the economic door. It may be that getting his first job, or not getting it, will be the most crucial event in his life. Certainly his well-being is at stake--certainly his future role in the democratic way of life is at stake. Worthwhile employment is a necessary ingredient of his effective democratic participation. For him, good citizenship and full employment run hand in hand, and it is the determined responsibility of vocational educators to join those hands with a dynamic and efficient program of vocational education.

The central purpose of vocational education for all occupations has been related to facilitating the process of preparing people for work, and helping those employed to become more effective in their work.

Public education must consider that:

1. The objectives of vocational education should be coterminous with intellectual training and personal development.

2. Occupational education should be made available to all, both pre-employment and upgrading.

3. The objectives of vocational education should be primarily those of occupational preparation, in tune with the emerging labor market and

open to large numbers of students as an alternative to the academic specialization route.

There are, however, several misconceptions about vocational education for all occupations which should be emphasized:

1. Vocational education cannot create jobs, but if jobs exist, vocational education can provide the training needed.

2. Vocational education cannot cure the dropout problem in schools, but it is possible for many potential dropouts to find new purpose for themselves through study in vocational education.

3. Vocational education cannot take the mental or social misfit and recast him into the form of a technical genius and a model of social virtue, but vocational education can provide the training and education in occupations for which these persons have ability and interest.

Major attention must be given to the following seven objectives of vocational education in the next five years.[1]

1. Vocational education will be more concerned about its economic value and its actual contributions to the economic growth of the state and the nation.

   a. The American economy is a cultural heritage that is inseparable from the institutions and ideals of a free and open society founded upon the premises of the Declaration of Independence and the Constitution of the United States of America.

   b. The success of the economy is the economic success of the individuals who

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[1]M. L. Barlow, director, Changing Emphasis on Vocational Education Objectives--the Future (Adapted from), (University of California, Los Angeles: Division of Vocational Education, April 24, 1963).

populate the United States. All persons are involved in the economy and it is axiomatic that a free economy is dependent upon members who are well informed.

c. It follows that the schools of California are obligated to offer instruction to the end that our youth become literate about the economy in which they participate. This would include knowledge of the American economic system and an individual's role in it.

2. Vocational education will be more closely correlated with current and foreseeable employment needs.

   a. In the future, vocational education programs will have built into their systems a means of adequate, up-to-date information about employment requirements--federal, state, and local.

   b. Adjustments in enrollments, need for new classes, and abandonment of classes will be the cooperative responsibility of state and local administrators.

3. Vocational education will be made available to more of the total population and will be less restrictive than at any time in the past.

   a. Analysis of our practices reveal that we have offered vocational education in only a limited number of occupations and for entirely too few of the population.

   b. Future programs must make vocational education available in a wider variety of occupations and under new conditions which will overcome previous restrictions.

   c. Curriculum restrictions must give way to the need for occupational preparation, and schools must become more sensitive to their obligations for the vocational competency of students.

   d. We are obligated to the boys and girls, the men and women, of the state and nation to provide generously for their

occupational preparation.

4. Quality assurance will be observed and maintained in programs of vocational education.

   a. Students will be selected for vocational education curriculums only when their aptitudes, interests, and achievements indicate they will be able to attain the required occupational skills.

   b. Follow-up studies will be conducted to determine the relevance of the educational program to job placement and the ability to hold a job and advance to a better one.

   c. There will be communication with industry, labor, management, the community, and the State Department of Employment to develop job specifications and employment opportunity data.

5. The future objectives of vocational education will include increased attention to the occupational requirements of "youth with special needs."

   a. Vocational education has avoided the slow learner, the unmotivated student, and the socially and culturally deprived youth who are found in significant numbers in the public schools.

   b. General education has failed to meet the needs of such youth, and there is little evidence that general education can do much in the way of appropriate occupational education for these persons.

   c. New programs of vocational education will be added to the school curriculum which are occupationally centered, which will lead to employment in jobs known to exist, and which can be successful educational experiences for youth who cannot profit from instruction in the traditional programs.

   d. Diversity and flexibility must be the keynote of such programs, and instruction should be highly individualized in order to assure the occupational stability of

of such students when they actually enter upon full-time employment.

e. Specially trained teachers who understand the variety of needs of disadvantaged youth and who are occupationally competent in the vocational areas to be represented should be employed for these programs.

f. In the earlier stages of this work, experimental and pilot programs must be planned and conducted in order to develop practices to serve these youth more effectively.

6. Work-study programs will expand significantly and be designed to supplement work experience education.

   a. The vocational needs of a vast majority of high school students will be satisfied by a new emphasis upon programs that relate experience on the job with appropriate study of school subjects.

   b. The present system of subject matter values, which has a strangle hold on the curriculum, must be modified to include school-work programs as equally honorable to other subjects in the high school program.

7. The various services to instructional programs in vocational education will be vastly expanded and improved in the future.

   a. Because the instructional programs are complex--preparing many people for many occupations in many areas of the state--certain services are necessary to make the programs of instruction more effective and more efficient.

   b. High quality occupational competence will continue to be a priority item in teacher selection.

   c. Every teacher will eventually be required to earn a baccalaureate degree prior to beginning his career as a vocational teacher.

d. Teachers must plan on definite lifelong learning experiences. Such continuing education may become a matter of certification practice.

e. In the future of vocational education, much attention will be devoted to leadership development.

f. New understandings of leadership will be developed and administration will make it possible for evolving leadership qualities to develop.

One of the principles of vocational education is the general idea of the primacy of the person.[2] Obviously this idea is not unique to vocational education, but it is nevertheless a principle of vocational education. We might reason as follows: Procedural changes--the natural product of changing time, circumstance, and environment--will occur, but we must not subordinate the person. Our task is not to serve procedure, red tape, or even the occupations, but our purpose is to provide for the needs of people who will enter these occupations. This emphasis was quite clear in the Vocational Education Act of 1963, but it was not new--merely another expression of a basic, unchanging principle of vocational education.

Another principle of vocational education is that a balance must be maintained between the vocational education programs in the schools and the occupational needs in the world of work. In the attempt to insure that a balance can be maintained, vocational educators invented the advisory committee. When the principle is being properly applied, a reasonable balance can be maintained between persons in training and occupational need.

We must identify the issues or factors that produced this increased interest and support and be sure that our efforts are in the right direction so that they will produce desirable results and will help

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[2]M. L. Barlow, "The Theoretical Model for Vocational Education in a History of Change," (Summary Report of the Coastal, Northern and Southern Regional Conferences; Leadership for Vocational Education in California, November 1965).

solve the problems of today and tomorrow.[3] We must face criticisms for not doing more and not doing it fast enough.

We must expect that new agencies and organizations are going to be involved, that private groups (profit or non-profit) and public agencies (educational and otherwise--local, state, and federal) are all going to get into the act.

I have already identified what I feel are the forces or factors in society that produced this great interest in vocational education. Let me cite just one of many examples I could use. The following is quoted from the Educational News Service analysis of the Watts hearings:

> 'Training for jobs and creating a feeling of personal worth are the two major contributions public schools can make toward the rehabilitation of riot-torn Watts.' These two assertions recurred time and again during day-long testimony heard by the Assembly Interim Education Committee at the Edwin Markham School, just a few blocks from where bulldozers still shoved away at the rubble left by four days of terror, looting and burning in August. Witnesses were Watts mothers, teachers, probation officers, social workers and union spokesmen. Most agreed that advancement and vocational schools to help Negroes become employable are needed as a direct attack on the job problem for adults, beginning with high school dropouts and ranging up the age scale. One witness at the October 15 hearing urged compulsory adult school attendance for the unemployed.

Thus, vocational education is the first suggestion for solving a racial problem in Los Angeles. You can be sure that testimony at this hearing will have an impact on the school administrators in Los Angeles. But it should also have an impact on every leader in vocational education in every metropolitan community.

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[3]Charles Patrick (president, San Diego City Colleges), "The Impact on My Administration by Recent Trends in Vocational Education," (Summary Report of the Coastal, Northern and Southern Regional Conferences; Leadership for Vocational Education in California, November 1965).

It seems obvious that the more one knows about leadership, the greater the opportunity for using effective techniques of leadership in achieving the social and economic goals of society. The role of leadership places a person in a position to help groups achieve their goals; progress toward these goals depends significantly upon the person who actually functions as a leader. It is this point that leads the historian Toynbee to place emphasis upon "the tiny creative minority" as an imperative aspect of a successful social order. Eugene Jennings points out that the "great changes in the history of an organization . . . generally result from the innovative efforts of a few superior individuals."[4]

BEATITUDES OF A LEADER

BLESSED is the leader who has not sought the high places, but who has been drafted into service because of his ability and willingness to serve.

BLESSED is the leader who knows where he is going, why he is going, and how to get there.

BLESSED is the leader who knows no discouragement, who presents no alibi.

BLESSED is the leader who knows how to lead without being dictatorial. True leaders are humble.

BLESSED is the leader who seeks the best for those he serves.

BLESSED is the leader who leads for the good of the most concerned and not for the personal gratification of his own ideas.

BLESSED is the leader who develops leaders while leading.

BLESSED is the leader who marches with the group, interprets correctly the signs on the pathway that leads to success.

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[4]Eugene E. Jennings, An Anatomy of Leadership (New York: Harper and Bros., 1960), p. 1.

BLESSED is the leader who has his head in the clouds but his feet on the ground.

BLESSED is the leader who considers leadership an opportunity for service.

---Author Unknown

Leadership occurs in an environment or setting where many forces (pressures, desires for action, etc.) exist.[5] There are forces in the leader, forces in the group(s), and forces in the situation. The following are suggestions for some ways of looking at the leader.

The leader has goals--They range from personal goals for self to larger, impersonal (unachievable by oneself) goals, such as international policy formation. These goals are part of the leader's dynamics and exert pressure on any decisions he makes.

The leader performs acts of leadership--These acts of leadership may be quantitatively and qualitatively different from those acts of leadership of any one of the followers.

The leader is a person--We know some things about the leader (external information) which are not the same things we know when we are acquainted with him. For instance, some of a leader's public acts may not be fully consistent with his privately held views, but those who know him best may be able to know which actions are based upon forces within the group, the situation, or the leader.

A survey of leadership research discloses six general observations to the answer to the question, "How does leadership occur?"

First, leadership phenomena "happen"; that "in the human setting of some spot where people get into interaction on a feeling basis, behaviors of a 'leadership' sort occur."[6]

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[5]Peter B. Vaill (assistant professor of business administration, University of California, Los Angeles), "Some Ways of Looking at Leadership" (Summary Report for the Coastal, Northern and Southern Regional Conferences; Leadership for Vocational Education in California, November 1965).

[6]Helen H. Jennings, editor, The Study of Leadership. First edition (quoted in C.G. Browne and Thomse S. Cohn), (Danville, Illinois: The Interstate Printers and Publishers, Inc., 1958), p. 41.

Second, the setting of the person's activity must be appropriate.[7]

Third, "leaders push themselves up."[8]

Fourth, the leader may be "selected, elected or spontaneously accepted by the group because he possesses or controls means (skill, knowledge, money, association, property, etc.) which the group desires to utilize to attain their objectives."[9]

Fifth, leaders "can be appointed by some top responsible power."[10]

Sixth, leadership may occur through forces quite outside the individual involved, such as the elevation of the vice-president in the event of the death of the president."[11]

The fourth, fifth, and sixth ideas appear to be related in that leaders may be selected by the group, by an individual, or by an event.

The research which answered the question, "Can leadership be developed?" indicates an unqualified "YES," but the implication is that this is an exceedingly complex undertaking. Before the present century, the major concern of most writers, philosophers, and social scientists was as follows:

> The great leader is essentially an exceptional man of outstanding qualities, and he is, without exceptions, a self-made man, the kind of self-made man who exhibits characteristics that potentially belong to every man in the course of human evolution.[12]

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[7] Ordway Tead, The Art of Leadership (New York: Whittlesey House, 1935), p. 23.

[8] Ibid., p. 25.

[9] Irving Knickerbocker, quoted in Browne and Cohn, op. cit., p. 11.

[10] Ordway Tead, op. cit., p. 25.

[11] Ibid., p. 22.

[12] Eugene E. Jennings, op. cit., p. xiv.

Early in the twentieth century, the following point of view began to prevail:

> Truly there are born leaders; but many of the rest of us possess qualities which can be developed with the result that our skill at leading may be appreciably strengthened.[13]

Research studies indicate that "leaders of particular groups seem to be chosen because their potentialities have been developed in particular directions as called for by the differentiated interests of group members."[14]

Helen Jennings describes the situation as follows:

> The leadership thus exhibited in the community by various members appears, in each instance, to reflect a 'style' of leadership--a particularized way of behaving derived from the personality attributes of the individual (in a chosen) position. Actually, however, the 'success' of several 'types' of personality in achieving leadership status . . . appears to depend, in turn, upon the fact that the population itself is comprised of so great a variety of personalities that no one personality has an exclusive position in esteem and influence necessary to a role of exclusive leadership. Each leader makes a contribution to some 'parts' of the membership which all members do not equally want or need. There may be very little overlap between the individuals who 'support' one leader and those who support another.[15]

Assuming that there may be some basis for accepting the above observations, it seems reasonable to say that all people possess leadership qualities in differing degrees and in relation to different activities; and further, different leadership skills can be developed relative to individual interests and abilities. Indeed, most formal leadership development is likely to be done among the less than "great" leaders.

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[13] Ordway Tead, op. cit., p. vii.

[14] Kamla Chowdhry and Theodore M. Newcomb, quoted in Browne and Cohn, op. cit., p. 274.

[15] Helen H. Jennings, quoted in Browne and Cohn, op. cit., p. 41.

Malcolm and Hulda Knowles, in their How to Develop Better Leaders, divide our second path into three parts under their discussion of "new dimensions for leadership training."[16]

> The added knowledge we now have about the nature of democratic leadership seems to suggest that leadership training is not the simple one-dimensional undertaking we have traditionally thought it to be. To develop fully competent leaders, we now have to work in three dimensions. The first dimension has to do with training in the particular knowledges and skills required for particular jobs, such as being chairman of particular committees, leading particular discussions, teaching particular subjects, or managing particular organizations. This is the dimension with which we are most familiar and in which most leadership is going on. The second dimension consists of developing generalized understandings of group behavior that are applicable to all groups in all situations. This second dimension might be thought of as the "liberal arts" program in leadership development whereas the first dimension is more akin to the "vocational training" aspect of leadership development. The third dimension consists of training all group members, not just the designated leaders, to be able to perform leadership functions. It recognizes that in many respects, the most effective training is done with the group as a whole and in terms of its continuous experience.

Leadership is control of certain types of situations, actual or potential, and followership is relatively helpless in those same situations. The amount of skillful experience and understanding that a person has in a situation determines the role that he may play--leader or follower.[17]

Such training groups as the National Training Laboratory for Group Development and its associated centers like those in Chicago and Denver and at the

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[16]Malcolm Knowles and Hulda Knowles, How to Develop Better Leaders (New York: Association Press, 1955), pp. 14-15.

[17]Emory S. Bogardus, "Leadership and Social Situations," quoted in Browne and Cohn, op. cit., p. 62.

University of Illinois are recognized for their superior performance. They show that leadership, like other skills, can be learned.[18]

Task Roles (Bass calls "task-oriented")

1. Initiator-Contributor: Suggests or proposes to the group new ideas or a changed way of regarding the group problem or goal. The novelty proposed may take the form of suggestions of a new group goal or a new definition of the problem. It may take the form of a suggested solution or some way of handling the difficulty that the group has encountered. Or it may take the form of a proposed new procedure for the group, a new way of organizing the group for the task ahead.

2. Information Seeker: Asks for clarification of suggestions made in terms of their factual accuracy and adequacy, for authoritative information and facts pertinent to the problem being discussed.

3. Opinion Giver: States his belief or opinion pertinently to a suggestion made or to alternative suggestions. The emphasis is on his proposal of what should become the group's view of pertinent values, not primarily upon relevant facts or information.

4. Elaborator: Spells out suggestions in terms of examples of developed meanings; offers a rationale for suggestions previously made and tries to deduce how an idea or suggestion would work out if adopted by the group.

5. Orienter: Defines the position of the group with respect to its goals, by summarizing what has occurred, points to departures from agreed upon directions or goals, or raises questions about the direction which the group discussion is taking.

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[18]Hubert Bonner, Group Dynamics (New York: The Ronald Press Company, 1959), p. 196.

Maintenance Roles (Bass calls "interaction-oriented")

1. Harmonizer: Mediates the differences between other members, attempts to reconcile disagreements, relieves tension in conflict situations through jesting or pouring oil on the troubled waters, etc.

2. Gate-Keeper: Attempts to keep communication channels open by encouraging or facilitating the participation of others ("We haven't got the ideas of Mr. X yet," etc.) or by proposing regulation of the flow of communication ("Why don't we limit the length of our contributions so that everyone will have a chance to contribute?" etc.)

3. Encourager: Praises, agrees with, and accepts the contributions of others. He indicates warmth and solidarity in his attitude toward other group members, offers commendation and praise, and in various ways indicates understanding and acceptance of other points of view, ideas, and suggestions.

4. Standard Setter: Expresses standards for the group to attempt to achieve in its functioning or applies standards in evaluating the quality of group processes.

5. Compromiser: Operates from within a conflict in which his idea or opinion is involved. He may offer compromise by yielding status, by admitting his error, by discipling himself to maintain group harmony, or by coming "halfway" in moving along with the group.

Individual Roles (Bass calls "self-oriented")

1. Aggressor: May work in many ways--deflating the status of others, expressing disapproval of the values, acts, or feelings of others, attacking the group or the problem it is working on, joking aggressively, showing envy toward another's contribution by taking credit for it, etc.

2. Blocker: Tends to be negativistic and stubbornly resistant, disagreeing and opposing without or beyond "reason" and attempting to maintain or bring back an issue after the group has rejected or bypassed it.

3. Self-Confessor: Uses the audience opportunity which the group setting provides to express personal, non-group oriented "feelings," "insights," "ideologies," etc.

4. Playboy: Makes a display of his lack of involvement in the group's processes. This may take the form of cynicism, nonchalance, horseplay, and other more or less studied forms of "out of field" behavior.

5. Dominator: Tries to assert authority and superiority in manipulating the group or certain members of the group. This domination may take the form of flattery, of asserting a superior status or right to attention, giving directions authoritatively, interrupting the contributions of others, etc.

6. Special Interest Pleader: Speaks for the "small businessman," the "grass roots" community, the "housewife," "labor," "the woman's point of view," etc., usually cloaking his own prejudices and beliefs in the stereotype which best fits his individual need.[19]

About fifteen years ago, the American Association of School Administrators proposed a comprehensive set of public relations objectives for the nation's educational system. Nothing much ever came of it, but with a few alterations, the outline might serve you well.[20]

Try these suggested objectives for size:

1. To inform the public about the work of vocational education (what it is, what it does, whom it affects).

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[19] K.D. Benne and Paul Sheats, "Functional Roles of Group Members," Journal of Social Issues, Vol. 4, No. 2 (1948).

[20] Kenneth Owler Smith, "Working with the Image of Vocational Education," Summary Report of the Coastal, Central, & Southern Regional Conferences (March-April, 1966), Leadership for Vocational Education in California.

2. To establish confidence in the program of vocational education.

3. To rally support for the proper maintenance of vocational education programs.

4. To develop awareness of the value of vocational education in a democracy.

5. To improve the partnership concept by uniting parents, teachers, counselors, and advisors in meeting the educational needs of the students.

6. To integrate the home, the school, labor, management, and the community in meeting the vocational education needs of the students.

7. To correct misunderstandings about the objectives and methods of vocational education through a consistent program of information.

You probably would want to add a few points, but this list might do for openers.

Once you decide to seek these objectives, public relations counsel would advise you to establish a few ground rules. Just to keep the lists even, here is another roster of seven vocational education public relations programs:

1. Must be honest in both intent and execution.

2. Must be intrinsic, a part of the total program of education.

3. Must be continuous.

4. Must be positive in approach (no complaining or whining).

5. Must be comprehensive (do not leave things out because you do not like them).

6. Must be sensitive to many publics, and, if possible, designed to meet the specific needs of these many publics; for example, parents or legislators.

7. Must be professionally communicated in commonly-understood terms.

Professional communicators--the people who know how to activate your public relations programs--are not to be found on every street corner, or, as tradition has it, drowning their sorrows in every neighborhood bar as the jukebox blares forth a tired rendition of "Days of Wine and Roses."

But they do exist. Many of them already are in your ranks "hiding," as it were, under the guise of teaching certificates. Seek them out and give them an opportunity to work for you.

There is another source of supply in the teacher training institutions. Again they do not have labels on them, but they are there, and they are eager for the proper chance to exercise their persuasive abilities.

In addition, there is a large, relatively untapped pool of talent in the companies and the unions which have such a basic interest in the success of vocational education. These people, on occasion, have contributed their skills to the cause, but they are awaiting your properly-phrased invitation to the party.

Another source of talent is composed of the men and women now working in the state's news media, in the public relations companies, on the publicity staffs, and in the advertising agencies. Fortunately for you, vocational education is not as hidebound as some other elements of the school structure. You long ago figured out how to get the skilled people you wanted. Is it not possible that you could use your proven abilities to attract trained communicators to your cause?

The final step in the public relations appraisal is evaluation. This is the process by which we examine what we have done, in terms of the objectives we set for ourselves. Obviously, it is too early to exercise the evaluation procedure. We have not done enough to bring the "image" of vocational education into focus with the facts.

Some persons have more and better equipment for leadership than others.[21] We have already attempted

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[21] Adapted from Murray G. Ross and Charles E. Hendry, New Understandings of Leadership (New York: Association press, 1957), pp. 130-6.

to emphasize this point, and we reiterate it here. Some persons have acquired--and not by conscious effort--qualities of personality that equip them in a unique way for leadership. While few persons today subscribe to the "great man" theory of leadership, it is unrealistic not to recognize that in any given group some persons are better equipped by virtue of their sensitivity to others' needs, their initiative, and so on, to serve as leaders. A leadership development program which does not recognize this fact is predisposed to a high failure rate. Courses of various kinds "provide much useful information and valuable contacts; but they can never in and of themselves make leaders . . . This is because . . . leadership at a high level demands certain constitutional and temperamental characteristics which cannot be inculcated by training alone, regardless of its thoroughness or pedagogical sophistication." While our own assertions vary somewhat from this, we are in essential agreement that fundamental in the development of leadership are certain aspects of personality and character, which the adult has or does not have. No training can provide these traits if the adult does not possess them. Therefore, prime consideration in any sound leadership development program is surely the discovery of means by which to identify and develop persons with leadership potential.

Leaders want to succeed. Among the factors which one must look for in the selection of potential leaders is that of motivation. One may find a person with what appears to be all the qualifications of leadership except the desire to do well in whatever job he takes on. Some of the data we have reported earlier in this document suggest that such a person will not succeed. Apparently, there must be willingness to accept a position of leadership and a sufficient drive to be willing to accept the responsibilities involved.

The "hungry fighter" sometimes has less native ability than many of those whom he defeats; his determination compensates for what he lacks in coordination. The degree and kind of motivation is, therefore, a factor in leadership capacity and potential. Of course, a leader may be reluctant to take on a specific task but what distinguishes him as a leader is his desire to do well--even the distasteful. He has ambition of a general nature which urges him to do well whatever he undertakes. This factor, so easily overlooked, must be considered with the above in selecting persons for training in a leadership development program.

The task for which leadership is required is a critical factor which must be taken into account in any leadership program. Leadership is required for different kinds of levels of work; for example, there is need for the top-level policy-making leader and for the work-gang leader, the chairman of the board of directors and the chairman of one of the board's subcommittees, the boys' stamp club leader and the boys' football coach, the executive of the head office and the executive of the branch office. These are different jobs and each demands a somewhat different type of leadership. Not all require the type of leader popularly portrayed as the "top-level executive" who unquestionably requires special capacity "to make final decisions and take risks."

While, therefore, a leadership development program should, in our view, be aware of the general qualities of leadership, it should also recognize the various levels or tasks for which leadership is required and should develop a recruiting and training program with this in mind. It should, perhaps, be added in this connection that effectiveness at this point requires many refinements in training and placing leaders. All social clubs, for example, require some common characteristics in their leadership pattern; not all social clubs are the same, and therefore each club probably requires a rather different type of leadership. Similarly, while one can talk in general terms about requirements for "top-level executive" jobs in business, not all of these jobs call for precisely the same kind of leadership.

An effective leadership training program will give consideration to the various kinds of tasks for which leadership is required; it will also be sensitive to the fact that each task calls for somewhat different qualities of leadership. This the "situationists" have contributed to leadership theory and practice. The situation (including the culture, the group, the pattern of interaction) is a variable which must be considered in leadership selection and training.

Leadership is not to be confused with mere verbal facility. Leaders are often articulate and certainly always able to communicate with members of their group. But many leaders are not facile in speech. To the contrary, some leaders have difficulty with grammatical or even coherent speech. Often, however, (and this is especially true in social, recreational, and educational organizations), a person

is given a leadership position because of his ability to handle words. Such persons frequently prove to be quite incompetent, because articulateness is not to be equated with capacity to communicate (in the sense of establishing mutual understanding) or with other requirements of leadership. This is given special mention because we have so often seen a person chosen for leadership apparently because he was both vocal and articulate. Apart from appearance, perhaps one notices first about a person his capacity to handle words and ideas. This may well be the reason why verbal facility sometimes plays such an important part in leadership selection, which must, however, as we have suggested, be based on more significant characteristics.

Leadership cannot be taught. An individual must himself learn to be a leader. This distinction between teaching and learning may appear to be superficial; we consider it to be fundamental. The development of leadership capacity is one that goes on internally. The individual with native capacity and with desire, who is struggling with the problem of performing as a leader in a particular situation, is an individual who (unless he is blocked by psychological factors) is developing. He may be aided by advice and support from others, he may get some help from a lecture or a training course, he may find reading or a conference of value, but fundamentally, it is the internal struggle which goes on as he comes to grips with specific leadership problems that leads to his growth and development. Indeed, what he gets out of counseling, conferences or reading is often determined by the nature of this internal struggle with a problem.

This is not to say that there is no learning value in conferences and retreats from the job. But the essence of Toynbee's concept of "withdrawal-return" is that one withdraws for reflection, meditation, and refreshment of one's creative powers, and returns to a task with renewed capacity. But the relationship to the job is a vital factor. Without it, the element of withdrawal is meaningless. Learning, in the sense of developing one's full powers, involves the awareness of internal struggle to master a problem. Developing one's capacity for leadership requires one to come to grips at first hand with real problems of leadership.

TEAM WORK

The world is full of problems,
There's much to cause distress;
We are all bowed beneath the cares
That daily round us press.
There's only one solution,
'Tis simply stated thus:
"A little less of you or me,
A little more of us."
The rule of each one for himself
Most foolish is to follow;
It brings no savor to the game,
Its victories are hollow.
But the other plan has never failed
To bring satisfaction, plus:
"A little less of you or me,
A little more of us."
A flake of snow is very small,
'Tis lost to sight quite quickly;
But many flakes combined will fill
The roads and pathways thickly.
United we can face the fight
Without distress or fuss;
"A little less of you or me,
A little more of us."

INTERMEDIATE AND LONG-RANGE PROGRAM PLANNING IN VOCATIONAL-TECHNICAL EDUCATION

Joseph T. Nerden*

THE NEED FOR PLANNING

When one considers the many functional and operational differences which exist between vocational-technical education on the one hand and all other forms of education on the other, one must be impressed with the dynamic, fluid, ever-changing characteristics of the education which prepares people for the world of work. Quite unlike all other forms of education, vocational-technical education must be perpetually concerned with the occupational needs of youth and adults, the needs of employers for skilled and trained personnel, and the concomitant aspects of vocational education which provide individuals with the necessary citizenship qualities and characteristics which are meant to help the individual live in a social milieu.

Since vocational-technical education must reflect the constantly changing needs of employers and at the same time meet the requirements of individuals who will enter concurrently the world of work and citizenship, curriculums will change for those who participate in the training and education. Changes will also be required in facilities, in equipment and in the preparation of the faculty which conducts the training programs. It may be trite to indicate that vocational-technical education must be particularly responsive to the needs of the state and national economy, to social changes, and to current trends. Changes which occur in this broad socio-economic context constantly make new demands upon vocational-technical education. For example, one of the criteria which is immediately examined in an area which is under consideration by a new industry is the availability of a steady supply of trained personnel to fill its employee personnel demands. As part of this personnel availability characteristic, such industries often look intensively at the possibilities for in-service growth programs of employed personnel. Hence, in instances where a.) an industry is seeking to locate an expansion plant, b.) a new plant in which a new product or a new

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process may be initiated and put into operation, c.) a new commercial establishment is considering relocation or expansion, or d.) a hospital, nursing home, or one of the other paramedical services is considering growth and expansion, the availability of trained and educated individuals is of paramount importance. This is both a social and economic facet of the area. The immediate task in these instances is to fill positions at the time of the opening of the new branch or new plant; however, the long-range planning must consider both the in-service growth programs for those individuals that arrive with the new plant or business and the need for all kinds of in-service growth programs for employed personnel, once the business or plant begins operation.

Industry has always been quick to point out that the rapid growth of technology and the need to remain competitive at all times requires that the industry either invest enormous sums of money in training and retraining of its own personnel, or expect that this education and training function will be efficiently performed by educational institutions in the region. Thus, vocational-technical education cannot be a rigidly planned educational enterprise; it must always remain responsive to the needs of individuals for preparation for the world of work and at the same time provide industries, businesses, and other employing agencies in the field with a constant supply of trained, skilled and educated individuals, and opportunities for employed personnel to be updated and/or upgraded.

PLANNING CONSIDERATIONS

Intermediate and long-range program planning may take several different forms, depending upon the information that is available to the educational planning agency. When certain kinds of information are available well in advance of the planning stage, two or three of the major steps which must be anticipated in intermediate and in long-range planning may be skipped over and the more intricate details of the planning engaged in immediately. However, educational planning should follow a logical and reasonable procedure. Once the need for trained and skilled individuals is determined by means of labor market surveys, by means of recourse to the records of the employment security agency, and through regional studies conducted by public or private agencies, efforts must be made to disclose how many individuals in a region may be available for such training programs.

Since the training programs that are offered in a vocational-technical facility encompass such a wide variety of occupations, information to assist in the planning operation must come from a variety of agencies. Interest inventories conducted in the schools in the region often provide information concerning how many junior high school or senior high school individuals anticipate enrollment in training programs designed to enable them to equip themselves for the world of work. Details concerning the kinds of training in which these individuals would engage would of course have to be determined. In addition, from information secured from public and private employment agencies, the Employment Security Commission, and regional labor market studies, the needs and interest inventories assembled for adults, out-of-school youth, and other individuals would have to be analyzed.

Thus, with the general needs for vocational-technical training clearly identified, and with the specific interests of individuals who are concerned with engaging in such vocational-technical education programs determined, the next step should be the study of the required occupations as indicated. This should be done with a view to grouping the occupations into families or clusters of occupations. Hence, careful analysis of the common elements of the occupational training needed in each of the individual areas of work and grouping these common elements together will tend to produce the eventual curriculums which should be provided within the new or expanded institution.

Only when the curriculums have been determined, and the potential enrollments in the curriculums have been estimated, can the next factor, that of facilities, be considered. The facilities and the equipment, which will make possible the effective and efficient offering of the curriculums depend upon many considerations. These include the age of the enrollees, the level at which the curriculums are to be offered (high school or post-high school), the determination of whether the program is to be purely an adult extension program, the length of the training program, and other similar control factors. If, for example, the same facility is to be used for both short-term and long term vocational-technical training, the facilities and the equipment must reflect this kind of thinking and planning, and furthermore, should affect the selection of the staff and faculty. For example, the faculty must be carefully selected so that each faculty member will come to the task of instruction well-prepared from the standpoint of his

background of work experience and his professional education. It is not easy to secure faculty members with the desired professional education competencies since the most sought-after characteristics in vocational-technical instructors are those related to the background of practical work experience and the accompanying technical knowledge. Such individuals often do not go through the usual professional teacher education procedures and, hence, lack some of the qualities normally found in regular teacher education institution graduates. Intermediate and long-range planning must also take into account the professional education deficiencies of the prospective instructors, and provisions must be made to alleviate these deficiencies, either directly prior to employment or directly thereafter.

The instructional faculty is not the only part of the personnel and staffing responsibility which will require attention. The upper echelons of the professional staff must be provided. Consideration must be given to the kinds and quality of individuals who are selected for major responsibilities in leading, supervising, and administering the total operations of the vocational-technical program. Here again, competencies of a wide variety are generally sought, but it is not always possible to locate and employ individuals who have leadership capabilities and the ability to administer and supervise programs of vocational-technical education. Intermediate and long-range program planning must be concerned with the availability of professional education opportunities for individuals who are employed in administrative and supervisory capacities so that these individuals may obtain the needed competencies through workshops, summer study, and extension work.

FACTORS CREATING DIFFERENCES IN PLANNING BY REGION AND COMMUNITY

Once a program of vocational-technical education has been established and has been in operation long enough for evaluation of the needs of potential enrollees and employers, the ever-changing needs and requirements of both these groups will demand constant analysis and action. However, in those areas of the nation where vocational-technical education programs have yet to be established, a number of social, economic, and other elements must be taken into consideration. These must be examined in the intermediate and long-range planning for any programs anticipated for the region or area. For example, in

the highly industrialized segments of the nation, such as New England and the north central and far western regions, the urgency and constancy of demand for more and more highly skilled craftsmen and technicians is a matter of record. To these areas come all of the highly technical businesses and industries in the nation seeking the kinds of personnel needed to fill skilled and technical positions. These are the areas in the nation that have extensively engaged over a long period of time in technical training and in the preparation of skilled craftsmen. They have built up a reputation for preparing individuals for the world of work in a manner satisfactory to employers. They have also provided extensive facilities for the upgrading and updating of employed youth and adults. Thus, individuals who are knowledgeable in the field of the computer sciences and who expect to be employed in the business-technical fields, skilled persons in the field of health and the paramedical areas, technically trained people in the fields of agriculture and agri-business pursuits, and others of similar categories are eagerly sought in these highly industrialized and vocationally developed areas. For example, in the greater Hartford, Connecticut area, great numbers of individuals are absorbed by the aircraft industry and its supporting industries. These include most of the highly technical kinds of technicians and skilled craftsmen urgently needed in the building of military and civilian aircraft. Also, in the New Castle County, Delaware area, which is the home of the tremendous DuPont industries, a broad and comprehensive category of curriculums and occupations must be provided in order to fully prepare potential employees and take care of updating and upgrading of employed youth and adults in this highly industrialized region. Everything from short-term training to three years of post-high school, highly technical engineering-oriented curriculums must be offered. In such highly industrialized areas, the concept of training has become a tradition.

By contrast, in other regions of the United States such as the Southeast, which is now changing from an agricultural economy and rural way of life to one in which industry and manufacturing will play an ever-increasing role, intermediate and long-range program planning tends to take on quite different characteristics. Several business concerns and industries have expanded into regions such as the Southeast, but the areas have yet to establish themselves as major manufacturing areas of the nation. Also, the businesses and industries have yet to develop the image of being important major

manufacturing and business organizations. Some of the textile plants from the North have expanded, and in moving to the Southeast, have brought with them the technology and manufacturing methods associated with synthetic fibers. This has produced a need for a limited number of technicians and craftsmen, and has, to some extent, brought about new training needs in the changing Southeast. The future may see quite different developments in the Southeast, but for the time being, it may be noted that many of the industries that have expanded into the Southeast have been those which do not require as many highly skilled craftsmen and technicians as do those which have long been established in the highly industrialized areas of the nation. Hence, the need in these new areas is commonly for operators on a short term basis. As the region develops, the need for operators will gradually become a need for skilled craftsmen and technicians. The planning should so reflect this characteristic.

Intermediate planning should be completely cognizant of the immediate need for large numbers of operators for the industries which are currently operating in such a region. Long-range planning should be fully cognizant of the need to prepare individuals for the world of work, even though a need does not exist at the present time in the region for the skills and competencies for which they are being trained. In a sense, training must be on a broad geographical basis; it must be possible for individuals to equip themselves for work in occupations which may yet come to the region. The establishment of "pools" of skilled craftsmen and technicians will ultimately attract many of the industries which are presently locating in more highly industrialized areas, close to the constant source of high level trained workers. Thus, intermediate planning will provide the necessary training for individuals to be employed at certain kinds of jobs which exist at the present time or soon will exist in the area. Long-range planning in this instance would be broader; it would anticipate the wishes of young people and adults to be trained for skilled and technical positions for industries yet to come to the region. Broadly categorized, these industries are those encompassing the occupational areas which are currently understood to be under the extensive umbrella of vocational education. These areas include trades and industries, technical occupations, health occupations, agricultural and agri-business occupations, business and distributive occupations, and, where the possibility exists, occupations in the oceanographic and fishing regions.

ORDER OF PRIORITIES IN PLANNING

Whether a vocational-technical facility exists in, or is being planned for, a region, there is need to determine all of the factors which have a bearing upon the needs and ultimate successes of the vocational-technical venture. These factors are generally called "demographic factors" and include all of those social and economic characteristics of the region which bear upon vocational-technical education. These demographic factors include the age groupings of those who are employed, the kinds of work in which they are employed, the numbers of years of formal schooling completed by the bulk of the population, the kinds of employment which exist in the region, the tax structure, the total population, the numbers of females that are employed, the school population, the average income of people in the region, the numbers of students graduating from the high schools in the region, and many other factors which when considered together, present a profile of the people in the region.

One of the important characteristics in studying a region is that of the population growth and the migration of people to or from the region. For example, in one of the very highly industrialized areas of the Midwest that was studied recently, it was clear that the population had been static for approximately twenty years. There had been neither appreciable growth nor decline in population. The supply of skilled workers and technical personnel going into the industries in the region had been stable, and for all practical purposes, the region was considered a "static one," a factor about which the local chamber of commerce and the area manufacturing association expressed concern, since no new enterprise had seriously considered the area for new and/or expanded facilities. By comparison, the population of one of the areas of the Southeast which is now experiencing a renaissance in industrial growth, increased from slightly more than 50,000 to approximately 120,000 during the last ten years. Certainly, such a region, in its intermediate and long-range planning, must take into account far greater potential for the preparation of skilled craftsmen and technicians than the "static region" indicated above. In a sense, the migration of individuals to an area is a positive indication of the ability of the region to support, both with trainees and finances, a projected growth in vocational-technical education.

Another of the important characteristics that will affect intermediate and long-range planning is that of "lead time." This has been true in both "static" areas and those which have grown rapidly in population. The lead time which is referred to here concerns the time which vocational-technical authorities need to plan ahead, build, staff, equip, and enroll individuals for training programs designed to fill mainly those highly skilled and technical occupation employment categories where new products and new processes are anticipated. Intermediate and long-range planners should consider very carefully this factor of lead time, and the information held by chambers of commerce, hospitals in the region, manufacturers' associations, employers' associations, and professional organizations should be thoroughly checked. Through constant contact with associations, organizations, and employers in the region, it may be possible to determine when a new product or a new process is to be announced and when it will be put into production or use. This is a very carefully held secret in many instances, but the limited information that may be made available to the vocational-technical planning authorities should be carefully studied and early plans made for the training of individuals to fill the occupational categories that will be required when the product or process is ready to be announced. Since it often takes as many as five years from the original survey and planning decisions to the time when individuals can be employed, the urgency and the wisdom of using every available device to obtain lead time information is clearly evident. Particularly in the case of the two-year highly technical, engineering-oriented technician, where the need for individuals of this type is already critical, the urgency of lead time information is essential.

Another significant factor which must be considered in the intermediate and long-range planning of a program of vocational-technical education is the vocational-technical training and education which may currently be available in the region. It is possible that all of the needed vocational-technical education will not be offered by regularly organized public school facilities or by institutions which are operated under the authority of public higher education trusteeship. The demographic characteristics of the region and the interest inventories obtained (as discussed earlier) should show the extent to which vocational-technical education must be provided in the region in order to serve the needs of employers, youth, and adults who are currently in the region, as

well as those who are yet to come to the region. It is conceivable that private schools of cosmetology, and private schools of business and computer science may have been in operation in the region for some time, and also that private technical institutes and similar kinds of private technical education agencies have been preparing individuals for entrance into the skilled crafts and technical occupations. These agencies will have to be considered in the planning conducted by vocational-technical education authorities. The very fact that the growth of technology will continue to provide job opportunities of a skilled and technical nature and that these job opportunities will in the foreseeable future continue to tax the ability of the nation to prepare people to fill these jobs, is an indication that all agencies in the field of vocational-technical education must work together on this important task. Thus, public vocational-technical education authorities must study the offerings available through private and proprietary schools in the region. If the quality of the program and the product of such educational ventures is consistent with the needs of the employers in the region or those expected to come to the region, some adjustment must be made in the long-range and intermediate planning priorities. The philosophy of education which is concerned with the opportunities available to all in the region to prepare for the world of work must be part of the consideration, and hopefully, cooperative arrangements can be developed which will serve the greatest number of individuals in the region. Public and higher education must also consider its respective responsibilities and make certain that respective segments of the vocational-technical program are adequately covered by the provisions and responsibilities of each. For example, in some states, the supervisory development training program is offered through the facilities of regional vocational-technical institutions, while in others it is offered directly by a university, a state department of education, or even by institutions which are conducted under the trusteeship of higher education boards.

Careful study of middle management's need for supervisory development training programs and for the acquisition of the competencies afforded by study and participation in SDT programs must be conducted in order that employers and individuals be served and the economy of the region benefited. Still further, since vocational-technical education at the present time may not be able to meet all of the demands of employers for skilled and technical personnel,

industry may, of necessity, have to assume larger segments of the training program. In the 89th Congress, Senator Ribicoff of Connecticut introduced a bill which would have provided a tax rebate to those industries which conducted their own industrial training programs. This was defeated, but in the First Session of the 90th Congress, Senator Prouty of Vermont introduced a bill which was an improvement over the Ribicoff bill, but which, in its final analysis, proposes to provide for a similar tax rebate for industries which are conducting training programs and thereby enabling individuals to prepare for employment. This is not unlike industrial apprenticeship training which has existed in industry for many years, except with the additional provision that a tax rebate be made available to the industry engaging in such a training program. Hence, in intermediate and long-range planning, vocational-technical education personnel who engage in such planning must be aware, not only of the involvement of local industry in its own training programs, but also of the possibility that in the near future, by virtue of federal legislation, industries may receive substantial financial aid from the government if they themselves conduct vocational-technical training activities. Planning which is not cognizant of this, or which deliberately plans public vocational-technical facilities without regard to the impact of such legislation (if it passes in the congress) could be disastrous. The results of intermediate and long-range vocational-technical education planning will depend largely upon the acuity and resourcefulness of individuals who engage in the planning activity.

Reference was made earlier to the need for planners to consult with chambers of commerce, manufacturers' associations, employers' associations, organizations, and all other agencies in the community with regard to information which might be of help in determining the employment needs, the occupational opportunities, and the numbers of individuals who will be needed to fill the occupational openings. However, planning operations must also be concerned with the quality and quantity of present, expanded, or projected programs of vocational-technical education. For this purpose, it is urgent that a wide variety of craft, technical, and overall consulting committees be organized to assist in this important activity of assessing the quantity and quality of the vocational-technical enterprise. The involvement of personnel drawn directly from the fields of employment, the crafts, technical occupations, etc. (not neglecting the fields of city, county, and state

government), will be needed if the ultimate in quality and quantity of vocational education is to be realized.

There are individuals who in the past have exhibited a high level of knowledge relative to the skills, the technical information, and the general education needed in the training programs. If operators are concerned, the simple skills and the limited needs for technical information and communication skills will be identifiable by these advisory or consultative persons. In the case of skilled craftsmen and technicians, the more extensive needs for skills, technical information, and communication skills will also be identifiable. If anything is certain, it is that expertise drawn directly from the field of work is needed at this stage of the planning. Further, the wisdom and advice provided by these individuals could conceivably reveal a much wider selection of occupations for which training and education should be provided.

Short-term training projects which require immediate planning will be revealed at the same time that the kinds of occupations which require longer periods of training will likewise be brought to the attention of the vocational-technical education planners. Often the lead time element, which is so urgently needed, may be revealed through the suggestions and the advice of the experts drawn into advisory, craft, and overall consulting committee activity. Vocational education being the dynamic form of education that it is, constantly requires an input of expert advice from the field. Committee activity of the type indicated here is urgent and should not have to continue to be subjected to the lack of attention to which it has been accustomed in the past. Lip service, sporadic assemblies of craft committees, and the occasional use of expert advisory personnel will never accomplish what is necessary. It is only through the use of regularly organized craft, advisory, and consulting committee activities, producing a perpetual input of information by knowledgeable people, that vocational-technical education will be kept current and virile.

The costs of inaugurating programs of vocational-technical education are considerable. When compared with the costs involved in organizing and putting into operation a program of academic education, they are quite striking. In some cases, putting a vocational-technical facility into operation may be three, four, or five times the cost of housing a similar number of students in an academic facility. Costs will vary

with the kinds, levels, and quality of curriculums offered, with greater expense experienced when training programs involve high-cost, metalworking equipment. Because of the cost involved, many communities or regions in the nation are reluctant to take on the responsibility for building and equipping vocational-technical facilities, even when the need for the vocational-technical education has been clearly indicated for the region. Some facilities may later develop into "skill centers," with students transported daily to these institutions from sending schools. Other kinds of required facilities may be designed as technical institutes, high school level comprehensive vocational-technical institutions, vocational-technical facilities within a comprehensive high school, or a comprehensive community college, while others may be technical facilities conducted under the authority of a college or university. In each case, however, the matter of costs of facilities and annual recurring costs to maintain the operation represent factors of considerable importance. Thus, in order for all American youth and adults to be served and so that each individual can obtain an equal opportunity to engage in vocational-technical training and education, it becomes necessary to join hands either intrastate or interstate. The idea is not new, but it is certainly one which deserves the renewed attention of the planners of intermediate and long-range vocational-technical facilities and programs. For many years, consolidated elementary school and consolidated secondary school facilities have been provided in many parts of the nation and, in general, have had a complementary effect upon the quality and quantity of education offered to the individuals in the region served by the consolidated educational institution. Vocational education on the other hand has delayed much of its regionalization or consolidation during the period in which academic education has been accepting the principle of consolidation and putting the principles into practice.

A few states have had unusual success in regionalizing or consolidating vocational opportunities. As early as 1910, the State of Connecticut developed its statewide program of regional vocational-technical schools, making available to all individuals in the state, opportunities to engage in trade and industrial education preparatory programs. At about the same period in history, several other states developed city or county vocational-technical facilities, some of which were considered regional in nature. New Jersey's regional vocational-technical centers which serve

entire counties, and the city programs of vocational-technical education which evolved in Massachusetts, Wisconsin, Pennsylvania, and other states, provided vocational education to limited numbers since all counties did not provide vocational-technical education; neither did all cities. Thus, vocational-technical education opportunities were available only where the county or city deemed it feasible to include such educational opportunities within its physical provisions and responsibilities.

Vocational-technical education in the nation must be served on a much broader basis. This has been made clearly evident by the specifications of the federal George-Barden Act, which made funds available for the planning of area vocational programs. Also, with the later passage of the Vocational Education Act of 1963, extensive funds were provided for the implementation of training programs on a "broad geographical" basis, and for all youth and adults in the nation. Intermediate and long-range vocational-technical education planning should be cognizant of the efforts that have been made in other states in the nation, and should carefully investigate the possibilities of providing more extensive vocational learning opportunities of a higher quality when communities, counties, regions, or even states cooperate in the matter of providing training programs. In the State of New York, the efforts of the Boards of Cooperative Educational Services (BOCES) resulted in many new regional vocational service centers going into operation. In middle and upper New York State, where the possibilities of individual communities being financially capable of conducting broad vocational-technical training opportunities were quite obviously limited, the State Board of Cooperative Educational Services made it possible for regions to cooperate in the planning, building, staffing, and supporting of regional vocational-technical institutions. Many of these institutions have been built and placed in service, and a large segment of the population which heretofore had not been served is now being served.

Within the past several years, the State of Iowa made provisions for widespread vocational-technical education for the youth and adults in that state through legislation which provided for "merged area vocational-technical facilities." Here again, the counties, communities, and areas within Iowa were urged to join together in the cooperative planning, building, staffing and financial supporting of appropriate vocational-technical facilities. The

program is now well under way, with the expectation that Iowa will be appropriately served by regional vocational-technical facilities and sharing the expense of operation on a regional basis.

One of the most spectacular developments in a multi-county development of a vocational-technical facility is the new Penta-County Vocational-Technical School in Ohio. As noted from the title, five counties joined hands in the planning and development of the institution; and the costs of maintaining and expanding the Penta-County Vocational School has been made a part of the responsibilities of each of the five counties.

All of the above have been on an intrastate basis; yet to be tried are facilities planned on an interstate basis. Obviously, this kind of projected arrangement will require much attention since the legislatures of the respective cooperating states will have need to inaugurate new procedures for the enactment of legislation timed (and comprehensive enough) to include all of the characteristics of a well-planned program of vocational-technical education to meet the needs of youth and adults in the multi-state region. Problems are inherent in any such negotiation and subsequent arrangement; but in the same manner that multi-county programs of vocational education have come into being, multi-state programs may be organized and facilitated. Interstate operation of vocational-technical facilities will do much to broaden those aspects of vocational-technical education which have been underlined and promoted by the Vocational Education Act of 1963. The provision of vocational education on a "broad geographical basis" is essential, if the provincialism which has existed in the nation as a whole for many years is to be finally dissipated. With a population which is becoming exceedingly mobile and with the skilled worker needs in some sections of the country increasing faster than in others, it is exceedingly important that vocational-technical education be "individual or student-centered" and that it provide these individuals with opportunities to engage in employment wherever the vocationally prepared individual prefers. When contrasted with the older and more provincial philosophy of serving only the employers in the immediate region, the idea of providing vocational-technical training opportunities for individuals who wish to work in a city, county, or state far from where the training was received, presents many advantages which in time should eradicate the provincialism of the past and make the

nation and its problems of employment and training a single problem.

STAFFING AND FINANCING THE VOCATIONAL-TECHNICAL PROGRAM

Obviously, it is impossible to arrive at any kind of staffing patterns for vocational-technical education programs until after the curriculums have been determined. These curriculums, when appropriately housed and equipped, will provide the basis for calculations concerning the needed faculty and other supporting staff. Intermediate and long-range planning should, of course, take the staffing pattern into consideration early in the planning, realizing that, in general eighty-five percent of the continuing recurring expenses for vocational-technical programs will be for faculty and staff services. Hence, a few precautions seem to be in order. These include the need, early in the planning and staffing operation to anticipate the employment of adequate and well-trained individuals to carry out the instructional responsibilities. Considerations of optimum class, laboratory, and shop size, as well as teacher-student ratio, will of course come up and should reflect the thinking which has long been dominant in the field of vocational-technical education that the ratio of students to teachers should be less than in comparable academic circumstances. Further, the urgent need for vocational-technical programs to maintain a level of currency and responsiveness to the needs of employers in the region will require that the supervisory and administrative staff of the vocational-technical program consist of several kinds of specialized persons not ordinarily found in comparable academic circumstances. Supervisors of supplementary, evening, adult, and extension programs in vocational-technical education have far more extensive responsibilities than do their counterparts in academic education. Hence, long-range planning provisions must be made for individuals of this type. Also, since many of those included in the faculty will assume their responsibilities within the new vocational-technical program without having had extensive professional preparation, adequate supervisory staff must be available to provide on-the-job professional education. Finally, while additional administrative and supervisory staff may be justified in terms of the requirements indicated above, care should be taken to maintain a reasonable balance between the administrative and instructional positions. This may be revealed early in the planning stage.

CONCLUSION

Personnel engaged in intermediate and long-range planning must examine the past and take from it those practices, procedures, characteristics, and qualities which have been successful. Added to this must come the urgently needed individual and group innovation, inventiveness, and creativeness which are ingredients in the production of programs of vocational-technical education for the future.

PART 2

PRESENTATIONS FROM THE UTAH INSTITUTE

RATIONALE AND NEED

C. Thomas Dean*

Professor Whitehead, the distinguished philosopher, stated that:

> The antithesis between a technical and a liberal education is fallacious. There can be no adequate technical education which is not liberal, and no liberal education which is not technical; that is, no education which does not impart both technique and intellectual vision. In simpler language, education should turn out the student with something he knows well and can do well. This intimate union of practice and theory aids both. The intellect does not work best in a vacuum.

Significant technological changes are taking place in industry at a phenomenal rate, opening new technological, economic and social frontiers, and creating new demands on society. One of these demands which must be met in order to sustain these changes is for the maintenance of a national labor force that is properly trained, competent and flexible. The rate of growth in advancing technology is dependent upon the provision of sufficient productive workers possessing the new skills required by technical changes typical of the scientific age. The training of such a competent work force is dependent upon the continuation of an educational program that is planned for this purpose.

The changing complex of engineering and science programs has left a void in the industrial team needed to produce our gross national product. The national need for technical workers at all levels has never been greater than it is today. The prediction by the U. S. Department of Labor is that there will be more than 1,000,000 technicians by 1975. This projection is indeed a challenge to everyone in the field of technical education.

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*Dr. Dean is chairman, Applied Arts and Sciences, California State College, Long Beach, California.

Since the advent of Sputnik there has been an increased interest in education. The federal government has allocated hundreds of millions of dollars for technical education with the primary objective of training individuals for the "world of work." It is interesting to note that not all of these funds are handled by the U. S. Office of Education but other agencies are being brought into the picture. We, in technical education, should be alert to these storm warnings.

Technical education is a most vital part of the total education program and serves the greatest need for a large segment of our school population. In considering technical education one must relate to three very important levels. These are the technical programs in the senior high schools, the technical education program in the junior college and the technology program leading to a baccalaureate degree in many colleges and universities throughout the country.

Since the passing of the Vocational Education Act of 1963, there has been a revitalization of occupational education at the senior high school level. This legislation relaxed the stipulations on occupational education and made it easier to fund programs at the secondary level. There is a strong need for technical education at the secondary level to meet the needs of many youths who will not be going on to further their education upon completing high school. Such educational programs will also have a tremendous impact toward eliminating the dropout problem.

The technical education program at the post-high school level is by far the strongest and provides the bulk of our technical workers for industry. This is where the focal point should be maintained for such training. However, there must be a reevaluation of the offerings to see whether or not we are doing an adequate job in the face of the changing demands from industry.

The highly skilled technician must possess many special abilities which adapt to the changing technological society in which we live. He must be trained with a broad base made by combining a strong liberal arts and cultural background with a strong technical skill. We must train for flexibility so that the technician can readily adjust to our mobile population.

The four-year technology program is rapidly expanding and is currently offered in approximately seventy-five colleges and universities. The pressures from industry for a minimum baccalaureate degree for advancement have mandated the implementation of the four-year technology program.

The industrial technology program is oriented toward training for supervisory and middle management positions and tends to fill the void left due to the changing philosophies of science and engineering. The chief asset of the curriculum is that the graduate is provided with a broad background of training which makes him flexible and adaptable to almost any kind of an industrial organization with a reasonable amount of in-service or job orientation training.

The two-year and four-year technical programs are vitally needed by industry and should be closely articulated. One of the primary values of the degree program is that of providing an "open-end" curriculum for the two-year technical student. It allows the outstanding student an opportunity to procure a baccalaureate degree in his major area. In order to properly expedite this, there must be close articulation between the two and the four-year programs.

The total technical education picture looks good and the prospects are outstanding for many "boom" years ahead. However, we must be constantly aware of the changing picture and be prepared to adapt our programs to new needs and techniques. We must not be like the Australian who bought himself a brand new shiny boomerang and then refused to throw away the old one.

ESTABLISHING RESEARCH AND DEVELOPMENT NEEDS

Austin G. Loveless*

We have heard from our previous speakers about the tremendous advances and changes that have been made in technology and what is yet to come. If I may enlarge on Dr. Gates' comments for one moment, let me call your attention to an interesting series of articles on this subject entitled, "A Revolution in Communication" - Marketing Insight, November 14, 1966, through January 23, 1967.

We have also heard from our previous speakers that there is a real, if not urgent, need for research in technical education.

We all recognize that any field can become obsolete and at a very rapid rate if it lacks adequate research. Technical education is no exception. The danger of becoming obsolete is particularly great when allied or competitive fields are developing rapidly.

In light of the changes noted, unless technical education develops a strong research program, it will tend to remain static, less and less related to reality, and less and less effective in comparison to competitive programs which are designed to meet the needs of society, which could and perhaps should be met by technical education. Changes can occur without research and planning, but such changes will often be blind and random, and unevaluated.

A few years ago Lamke wrote a devastating statement about research in teacher personnel; his statement could also apply to research in technical education:

> If the research during the last three years were to be wiped out in the field of medicine, agriculture, physics, or chemistry, our lives would be materially changed. If research in the area of teacher personnel during the last three years should vanish, education and educators would continue much as usual.[1]

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*Dr. Loveless is professor, Industrial and Technical Education Department, Utah State University, Logan, Utah.

[1]Tom A. Lamke, Review of Educational Research, Vol. 25, No. 3 (June, 1955), p. 192.

We can significantly paraphrase the last sentence to read: "If research in the area of technical education during the last three years should vanish, technical education and technical educators would continue much as usual."

The idea of the one researcher doing research either in the field or within his institution is not very realistic today. Research has become a team activity and calls for the coordinated efforts of many.

This concept places a definite responsibility upon the leadership in technical education to organize, plan, and provide opportunity for group action on the problems that exist in technical education.

What, then, is the role of the administrator of a technical education program, be it at the state level, or the local school level with regards to research? In my opinion, you people in leadership positions are, or should be, the keystone of the research effort. You have a two-fold responsibility. First, you must implement tried and proven research. We will all agree that the values of unapplied research in technical education are few. How might you implement research in your own field of administration? When you go before your staff with a proposed change in your organization, in your curriculum, structure, etc., do you have research to back up your proposed changes or are you basing your proposed changes on a hunch you might have concerning the problem?

The second part of your two-fold responsibility in promoting the research effort is that of creating an atmosphere or climate that is conducive to research. Chances are that if I should open this presentation up to discussion at this time, someone would ask, "Just what can we at the technical institute level do in the way of research?" Research is for the universities and research centers to do. Or you might say, "No one on my staff has the training required to do research." You might say that, but you do not need a highly trained researcher to do action type research. All you need is one or more staff members who are not satisfied with the status quo, who recognize a problem when they have one and who are willing to systematically attempt to find an answer to that problem. If in the process of trying to structure a systematic approach to a problem, you find that your staff does not have the necessary research skills, what will you do to help them? How many of you can tell me the name of the director of the research coordinating unit in

your state and where he is located? One of the prime functions of the research coordinating unit is to assist you in structuring research projects and proposals to help solve your problems.

If the research effort that is being made is to produce the results that are needed in the field of technical education, the administrative leadership will have to give research its full support.

TECHNICAL EDUCATION AND ACCREDITATION

William E. Mortimer*

Accreditation as applied in education is the recognition accorded to an institution that meets the standards or criteria established by some organization or association which is deemed competent to judge the adequacy of the institution. The general purpose of accreditation is to promote and insure high quality in educational programs. More specifically, there are several purposes for accreditation. These are:

1. To encourage educational institutions to improve their programs by providing for them standards or criteria established by a competent accrediting agency.

2. To facilitate the transfer of students from one institution to another. The transfer may be either horizontal or vertical. Most transfer seems to be vertical.

3. To inform those who employ graduates of an institution, or who examine its graduates for admission to employment, about the quality of training which the graduates have received.

4. To give support to administrative officers of an educational institution in maintaining high standards in effecting improvement.

5. To serve the general public by furnishing guidelines to prospective students on institutions they may wish to attend.

As the situation exists at the present time there is no nationwide accrediting agency for vocational education programs or schools or technical institute type programs or schools. Private business schools, private trade schools and private technical institutes each have an organization which includes the necessary procedures for accrediting the schools within their own organization.

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*Dr. Mortimer is a professor, Industrial and Technical Education Department, Utah State University, Logan, Utah.

Throughout the United States, very few publicly supported vocational and technical schools have been accredited through bona-fide accrediting procedures. State boards for vocational education operate under a state plan for vocational education and usually approve institutions who fulfill the requirements of the state plan, but this approval is not usually based upon conclusions reached through an evaluative process found in accreditation procedures.

DIFFERENT KINDS OF ACCREDITATION

Regional accrediting associations usually accredit the institution as a whole and in so doing they may give a three-year, a five-year, or a ten-year accreditation. The ten-year accreditation is usually the maximum given. The same type of accreditation may be given to certain curriculums within a school.

Another type of accreditation which is sometimes used is full accreditation, accreditation with comment, accreditation with probational status, or no accreditation. This system has not been used as extensively as the one discussed previously, but appears to be finding considerable favor.

The major items on which an institution is usually evaluated for accreditation purposes are as follows:

1. Administration
2. Business Affairs
3. Advisory Committees
4. Admissions and Records
5. Guidance and Counseling Services
6. Student Personnel Services
7. Public Relations
8. School Plant and Facilities
9. Instructional Staff
10. Instructional Materials
11. Instructional Programs (Curriculums)

12. Evaluation--students and programs

13. Libraries

It is customary for an institution seeking accreditation to prepare a self-evaluation report prior to the evaluation made by a visiting team. The self-evaluation report is usually prepared in two parts. Part 1 is the basic report of the institution and part 2 is the report of the divisions or departments.

AFTER ACCREDITATION

One of the worst things that can happen after an accreditation is for nothing to happen. No school is perfect and after the effort is made to prepare a self-evaluation report, to have a visitation team make an evaluation of the institution, and for this team to prepare a report, it is most unfortunate if something is not done to carry out the recommendations for improvement. A suggested chart for implementing the improvement program is given below, and it is recommended that such a chart or a better one be used by the school to bring about needed improvements.

SUGGESTED CHART FOR IMPLEMENTING IMPROVEMENT PROGRAMS

THINGS BEING DONE RATHER WELL	THINGS ACHIEVED ON A LESS DESIRABLE BASIS	THINGS NOT DONE WHICH SHOULD BE DONE	THINGS NOT DONE WHICH PERHAPS WILL NOT OR CANNOT BE DONE

Because of a felt need for the accreditation of two trade technical schools in Utah, a study was undertaken on the accreditation of vocational and technical education. Standards and evaluative criteria were prepared and arranged into an evaluative instrument. Also, a plan for preparing a self-evaluation was developed. The forms were used for a formal evaluation and accreditation for the two schools in Utah with the State Board for Vocational Education serving as the accreditation agency.

STATE TECHNICAL SERVICES ACT

Harlan L. Scherer*

The State Technical Services Act was passed by Congress in September of 1965. The statement made by President Johnson upon signing the bill very aptly describes the intent of this legislation.

He said, "This bill will do for American businessmen what the great Agricultural Extension Service has done for the American farmer. It will put into their hands the latest ideas and methods, the fruits of research and development."

The need for increased use of technology developed during the last two decades when technology began growing at a faster rate than business and industry could absorb it. Currently 60,000,000 new pages of technical data are published each year, and to this year's millions of pages, we must add last year's millions of pages and the countless pages of previous years.

This exciting technological growth rate is certain to continue, if for no other reason than the amount of money being spent on research and development. But even more conducive to the growth of technology is the fact that of all the scientists and engineers who ever lived, more than eighty percent are alive and working today; and of all the world's scientific technical discoveries, half have been made in the last fifteen years. The problem then is that much of this valuable flood of technology may be in danger of becoming strangled in its own volume and never realized for its potential contribution to industry unless new procedures for dealing with it are developed.

It is a phenomenon of our time that in the midst of technological plenty resulting from the expenditures of billions of dollars for research and development, a great deal of scientific and technical information is not recognized or utilized by large segments of business and industry. There are hundreds of new technological applications that would benefit the nation's businessmen, especially those in small and medium size firms.

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*Dr. Scherer is a professor of industrial education, Bemidji State College, Bemidji, Minnesota.

Specifically the act defines the following:

1. "Technical services" means activities or programs designed to enable businesses, commerce, and industrial establishments to acquire and use scientific and engineering information more effectively through such means as:

    a. Preparing and disseminating technical reports, abstracts, computer tapes, microfilm, reviews, and similar scientific or engineering information, including the establishment of state or interstate technical information centers for this purpose.

    b. Providing a reference service to identify sources of engineering and other scientific expertise.

    c. Sponsoring industrial workshops, seminars, training programs, extension courses, demonstrations, and field visits designed to encourage the more effective application of scientific and engineering information.

Further amplification of terms is also presented in the act with regard to "qualified institution, designated agency, participating institution," etc. Each state that desires to participate in the S. T. S. Act has to develop a five-year plan that:

1. Outlines the technological and economic conditions of the state and identifies the major regional and industrial problems.

2. Identifies the general approaches and measures to be used in the solution of these problems.

3. Explains the methods to be used in administering and coordinating the technical services program.

Various plans have been developed according to the criteria previously listed by the different participating states. One plan (Minnesota) stresses the following functions in their state plan.

1. Provide a collection, storage, retrieval and dissemination capacity of technical information to serve industrial needs.

2. Develop a reference service for sources of expertise.

3. Develop a corps of technical service agents to assist in transferring technology to industry.

4. Present specialized instruction through conferences, workshops, and seminar type programs.

The S. T. S. Act authorizes appropriations of $10 million for the fiscal year ending June 30, 1966; $20 million for the fiscal year ending June 30, 1967, and $30 million for the fiscal year ending June 30, 1968. The monies are to be distributed to the states on the basis of population; business, commercial, industrial and economic development and production efficiency, and technical resources. The monies appropriated for the fiscal year ending June 30, 1967, were approximately $3,850,000, hence you can readily see that the full impac. of federal expenditures for the State Technical Services Act has yet to be brought into play.

The final interpretation of the act followed the law, as passed, and was very broad. Unfortunately, as several members of the legal staff began examining program submissions, they felt more restrictions should be applied to the type of projects the states were submitting for approval. A close examination of the hearings held prior to the passage of the bill lent support to a more restrictive interpretation.

The net result of a narrower interpretation changed the idea of science as "an organized body of knowledge" into one of "hard" science. This new interpretation means that the states will have to be more selective and descriptive of projects that are submitted for matching funds. The primary changes involve the transfer of a readily defined technique to an audience that may be categorized as management or supervisory. Furthermore, all activities related to the S. T. S. Act that are provided support should be existing business, commerce and industry. This will eliminate S. T. S. support to start or to relocate new business.

In addition to the state programs for technical services, the act provides for supporting programs of special merit. The programs are intended to provide technical services which have broad regional or

national significance, or employ new techniques or methods not included in state programs.

A special program grant has been made to the University of Wisconsin for purposes of conducting courses in the latest developments in manufacturing technology through the use of a mobile laboratory to bring machining and instrumentation equipment to plant sites in key locations of the state. The University of Missouri has a regional program in wood utilization and technology for wood products industries in the states of Arkansas, Kansas, Missouri, and Oklahoma. Other programs of special merit are also being conducted by various institutions.

Another valuable program that is being furthered by the State Technical Services Act is the development of information retrieval systems and dissemination of technical and scientific innovations. Among the systems that are being utilized as a potential pattern for most states is the Aerospace Research Applications Center (ARAC) at Indiana University.

ARAC's purpose can be briefly stated as the identification of selected government sponsored research and development information to fit the stated needs of civilian oriented industry. Some 200,000 technical reports form the center's information base. Each month thousands of additional reports pour into the center's offices for classification and storage.

ARAC services, available to all industry on a subscription basis, channel research findings through several specially designed programs. These services are described briefly.

Retrospective search service--entire information base is searched to locate reports relevant to a specific problem.

Selective dissemination service--based on an interest profile developed by a company and the center, new material is searched twice each month by computers for relevant information.

Standard interest profiles--areas which have a high index of interest such as "Laser Research," "Quality Control and Reliability."

Industrial application service--abstracts of technical reports with industrial application

potential are forwarded to member companies each week.

Computer information service--designed to transfer the technology of new computer program developments to member firms.

Marketing information service

Special and experimental programs

Further information about the services of ARAC may be obtained by contacting:

Mr. Howard L. Timms, Director
Aerospace Research Applications Center
Indiana Memorial Union
Bloomington, Indiana 47405

As of March 15, fiscal year 1967, annual technical service programs have been approved for 34 states and approval is expected for another nine states this year. Thus in 1967, approximately 43 states are expected to be participating in the S. T. S. Act. The results of the act are to be evaluated at the end of a three-year program and further recommendations are to be made.

Personnel engaged in technical training should be aware of the services provided by the S. T. S. Act for business and industry and in some localities may even offer certain programs or seminars that are needed by local industries. State plans for implementing the S. T. S. Act may differ and before programs can be formulated, the plan of your state should be reviewed to see where your institution can make a contribution. Further information regarding the State Technical Services Act can be secured from:

Director, Office of State Technical Services
U. S. Department of Commerce
Washington, D. C. 20230

FACILITIES AND EQUIPMENT FOR TECHNICAL EDUCATION FROM PLANNING CONCEPTS TO PLANT

Milton E. Larson*

Facilities for technical education must provide the environment which will inspire and challenge youth and adults, and communicate to all the urgency of need coupled with great opportunity in technological fields. Facilities teach.

In 1964 we had 221,241 students enrolled in technical education; the projection by the U. S. Office of Education for 1970 is 675,500 with growth to 1,260,000 students by 1975. According to a recent survey of our fifty states, 1,872 new area vocational schools will be built between 1966 and 1975.

Significant in the facilities planning process are the following steps:

1. Careful identification of the objectives and purposes of technical education as related to the preparation of youth and adults for initial employment in technical positions and for advancement to higher positions through programs of in-service education.

2. Assessment of need at the national and state as well as local level. The 'citizen participation' approach is highly desirable in the determination of the need for technical education at the local level.

3. Projections of full-time day school students (300-500 desirable) and the necessary equalized valuation to support the program.

   a. Population and enrollment studies of the number of potential students for the proposed curriculums is desirable. Experience has shown that in areas of reasonable population density and good transportation facilities, post-high school institutions of technical institute type might expect to enroll 20 percent of the high school graduates

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who are not going to college or professional schools.

b. Potential enrollments can be determined by a survey of youths and adults to determine their desire to enroll; through follow-up studies of high school graduates; and by estimates of future high school graduates.

4. Selection of general and curriculum advisory committees to assist in the planning process. The general advisory committee is often formed into a steering committee and subcommittees for curriculum and instruction, student body, finances, and physical plant.

5. Development of the educational specifications by the educators assisted by advisory committees to tell the architect what is needed and to provide the vital information for architectural planning and design. The educational specifications need to provide: general information, complete listing of the facilities to be provided, and the relationships of the spaces to each other.

6. Selection of a site which is accessible to the region by automobile, of adequate size (100 acres for campus plan), having safe and suitable surface features and soil conditions suitable for construction; the site must be in harmony with the other planning of the region.

The laboratories and shops provide the "heart" of a technician education program. These must be "geared" to the needs of students who are industry bound. Laboratories must be designed to provide for real equipment, simulators, and adequate student work stations, as well as ample storage. Suggested space requirements range from sixty square feet per student for physics and chemistry to seventy square feet for fluid power.

In facilities planning for technical education, careful study and consideration needs to be given to several recent trends, namely:

1. Campus plan as compared with the compact plan

2. Core cluster planning

3. Team teaching

4. Modular scheduling

5. Centralized storage

6. Modular design

7. Utility walls and columns

8. Learning resource centers

9. Utilization of the total facility as a learning-teaching laboratory

10. Environmental control

11. Accommodation of physically handicapped individuals

A key to successful planning for the future is flexibility and providing the kind of facility which can readily be adapted to changing programs and needs. Good facilities cost about the same as poor facilities--the economy results from effective planning. Facilities reflect the image of education through both the instructional program and the status position which it gives to the total program. Now is the time to move ahead with vision, courage and determination in facilities for technical education.

PART 3

PRESENTATIONS FROM THE MISSISSIPPI INSTITUTE

LEADERSHIP IN EDUCATION

Willis A. LaVire*

Man's ego is being restored as a result of his enlightenment. No longer can outmoded models of leadership satisfy his quest for self-realization and self-determination. Man is demanding and will get a greater voice in his destiny. These demands are forcing the emergence of a newer theory of decision making and leadership. This new theory of leadership will play an ever increasing role of importance in education.

As man's ego is being strengthened his confidence is being redeveloped. This regained confidence requires a democratic theory of leadership. The democratic theory of leadership is based upon the following assumptions:

1. Leadership is not confined to those in status positions.

2. Power and authority as well as responsibility can be shared.

3. Everyone affected by a program or policy should have a part in decision-making with respect to that policy.

4. The line and staff organization is exclusively for the purpose of dividing labor and implementing policies and programs.

5. Security for the individual is found in a dynamic climate in which the individual shares the responsibility for decision making.

6. Evaluation is a group responsibility.

7. Good human relations are essential to group production and the meeting of needs of the members of the group.

8. Unity of purpose is secured through consensus and group loyalty.

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9. Maximum production is attained in a threat-free climate.

When leaders in education produce a climate in which each individual member of the educational group helps to make the decisions which affect the entire group, then and only then, can maximum efficiency be achieved. Every man likes to feel he has a say so in his own fate.

Line and staff organization does not provide for equality in decision-making on goals, programs, and policies. The emerging theory really calls for two types of organization within the same institution--one for policy decisions and the other for executive decisions. Emerging theory accepts the line and staff only for the purpose of implementing policies and programs developed by the total group concerned.

Democratic theory embraces the following assumptions:

1. All decisions do not have to be shared. Many implementing decisions are individual ones.

2. The official leader is responsible for enforcing policy.

3. An official leader has as much responsibility as anyone else to state his position and take his stand.

4. Emergency decisions may limit discussion and degree of consensus; therefore, the amount of time available can affect the decision making procedure.

5. If the group has been extended the opportunity to participate and refuses, the official leader should go ahead and make a decision.

6. The leader of the group has the responsibility for preserving the life of the group and should insist that group members work out agreements.

7. Authority is to be used for service of the group, not for individual aggrandizement.

Man is demanding that those who would practice leadership in the decision making process must first be those who have sufficient faith in man to dedicate

their leadership to the release of man's potential. To the school administrator this means that he who leads best is he who can fully release and utilize the potential of the school personnel.

When each member of the faculty participates in policy decisions, then and only then, will he give freely his support toward policy implementation. If the school administrator expects to achieve efficiency in the realization of his objectives, he must heed man's new demands.

Man is saying that diversity should be valued, for through diversity, he is able to foresee more clearly the consequences of his decision, and this is a direct appeal to increase the intelligence which is brought to bear on the decision. To the school administrator this means there are benefits to be derived simply by using that which democratic man professes to cherish.

To the school administrator the dependency creating experiences found in the authoritarian climate are inappropriate. The only positive means yet invented for the school administrator to resolve conflicts is found in the democratic process. Man is anxious to enjoy his evolving identity.

Individual man is once again on the move. Increased intelligence is powering this move. This time man is moving in the direction of self-direction. When man is placed in charge of his fate, he can march forward with confidence. Man will have a voice in the decision which affects him.

School administrators must find it within themselves to incorporate this emerging theory of leadership into their administration if education is to fulfill its lofty goals.

THE TECHNICAL STUDENT

Donald S. Phillips*

In the final analysis all educational programs are designed to serve individuals; therefore, it is important to spend time discussing the technical student. Failure to devote proper attention to the students to be served by a particular program can lead to undesirable outcomes. Fundamental to this discussion of the technical student is the assumption that technical education is a different type of education and that it attracts students with certain identifiable characteristics. However, it is important to realize that any attempt at describing people must deal in general terms, since there will be exceptions to any characteristic described.

One of the first studies dealing with the characteristics of post-high school students was completed during the thirties by Learned and Wood. This study showed differences among student bodies on several college campuses. Since the Learned and Wood study there have been several studies dealing with college students; however, the number of studies dealing with post-high school occupationally oriented students have been limited. As occupational education efforts at the post-high school level have increased, there has been an increased interest in learning more about students in these programs. This interest has generated several studies.

Probably one of the more comprehensive studies in this area is being conducted by Dr. Kenneth B. Hoyt, professor of education at the University of Iowa. In 1962 Dr. Hoyt initiated the Specialty Oriented Student Research Program to provide information for use by guidance counselors when working with students desiring to attend vocational, technical, or business programs after leaving high school.

Dr. Hoyt has coined the form "specially oriented student" which he describes as:

> . . . one whose motivations toward educational achievement are built largely

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around a desire to acquire a specific occupational skill or set of skills. Courses designed to broaden his potential for a vocational living have little or no appeal to this student. He may be described as expressing relatively more interest in being 'trained' than in being 'educated.'

The developments in technical education during the last ten years are well known to each of you. The growth in this field has been very exciting. Many new programs have been developed, new institutions have been built, and enrollments have greatly increased. Currently technical programs are found in many fields: health, agriculture, safety, business, engineering, etc. Whether or not the students in all of these fields possess common characteristics is a question which has yet to be satisfactorily answered; however, some tend to believe that the answer may be in the affirmative.

To remain on safe ground and avoid generalizations which cannot be supported, it is necessary to define the particular type of student to be discussed. Since my experience has been primarily in the engineering-related technologies, the remainder of the discussion will be concerned with describing characteristics of technical students in engineering-related technologies.

Again, it should be kept in mind that a description of students must be presented in general terms and that exceptions will be found.

GENERAL CHARACTERISTICS

Capable Average--The technical student is a person with capabilities, but one whose school record may look somewhat average. In many cases, these students have not been enrolled in educational programs which appealed to them or challenged them.

Interest in a field of specialization--Possibly through part-time jobs, hobbies, or involvement with gadgets this student has developed an interest in a field of specialization. This interest underlies his career decisions and choice of an educational program.

Willing to work--As previously stated the technical student may not have been a high achiever

in high school. Some may interpret this as laziness or a lack of motivation. However, a better interpretation is that the person is not motivated to do those things that were expected of him in his high school program. When the technical student becomes engaged in a program that ignites his interest, he is willing to work long and hard to achieve success.

Probably from a low or medium income family--The reason for this may be more financial than anything else. Students with limited financial resources may look upon the two-year program with favor for financial reasons. However, social mobility may also be a factor in explaining this fact.

Mathematics interest low--Many technical students openly express a dislike to mathematics. Usually this is a result of the type of mathematics with which they have had experience.

If this analysis of the technical student is accurate, then it is possible to get some insights concerning curriculums for these students. Technical curriculums should be designed for students with average or above average cognitive skills.

The technical student's interest in the field of specialization makes it important to provide for an early introduction to technical studies. Failure to include technical courses in the first semester reduces the attractiveness of the program to the student described.

The manner in which mathematics instruction is presented is also related to the peculiar characteristics of the technical student. Since he does not take to a theoretical approach in mathematics, it is necessary to develop specialized mathematics courses and correlate them with technical courses.

In designing curriculums, it is important to give primary consideration to the students to be served. The technical student is a unique student with identifiable characteristics. An identification of these characteristics is fundamental to the design of technical curriculums.

PROGRAM PATTERNS AND CURRICULUM DEVELOPMENT

Walter J. Brooking*

Initiation of a new program of technical education is a major undertaking. It usually takes a minimum of five years and many thousands of dollars to plan the program, assemble and orient the staff, equip facilities, and graduate the first class or two. The program is not fully started until its graduates are successfully employed. When an institution reports a new program, it is a statement of a task begun, but with much refinement and development still to be done.

New programs begun in 1966 were mainly in the engineering-related technologies with accompanying development of programs in the medical and health fields and in the agricultural occupations.

The Vocational Education Act of 1963 provided for expansion of facilities for training both technicians and employed adults at the technical level. The total expenditures resulting from this act in 1965 and 1966 combined was approximately $239 million. State and local funds overmatched federal funds by approximately two to one. Indications are that the 1964-1966 rate of growth of new institutions and of new programs will continue in 1967. Preparation of technicians is becoming a major educational undertaking.

One of the biggest problems in initiating a new technician program is in administration and staffing. There is a shortage of experienced and qualified technician education administrators and technical instructors. Starting approximately 250 new technician programs each year, many of them in institutions which have never taught technicians, involves staff recruitment and in-service orientation and training of up to 1,250 specialized professional personnel. Many state departments of education, cooperating with colleges and universities, are providing workshops, institutes, curriculum and program development studies and other courses to develop instructional staff. Much needs to be done because the instructional competence determines, in large measure, the ultimate quality of programs.

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Recruitment of qualified students is a major problem in the development of technical education programs. It is becoming evident that the future of many technical programs, and indeed the capability to satisfy the needs of the nation for highly skilled technicians, will depend upon the development of pretechnical post-high school programs for promising youth who have the desire but lack the scholastic preparation to enter high quality technical programs.

Various descriptive names are given to the programs designed to educate technicians, but almost all of them may be placed within the following general classifications of technical education objectives:

Physical science and related engineering technologies--This includes aeronautical and aerospace, architectual and building construction, chemical, mechanical design, nuclear, printing and many others.

Biological science technologies--This includes health and related technologies, dental hygiene, rehabilitation therapist, nursing and others.

Agricultural and related technologies--This includes livestock production, dairy production, poultry, horticulture, forestry and others.

Combined physical and biological science technologies--This includes agricultural equipment, dairy products processing, bio-medical, water and environmental control, scientific data processing and others.

Now that we have the institution, a faculty, and some students we must have something to teach. The curriculum for any high quality technician educating program must be based upon a clear and complete definition of what special abilities one must have and, in context with the nature and level of these abilities, what activities he must be able to perform, and with whom he works. The courses which constitute a curriculum for educating technicians are usually grouped under the following classifications:

1. Basic science and related mathematics course which provide the scientific foundations on which the technicians' specialization in application of that science lies.

2. Technical speciality courses and their auxiliary supporting studies which teach

the special skills, knowledge, techniques, procedures, materials, processes, apparatus, operations, and services which distinguish the technology from others.

3. Communication courses which teach oral, written and graphic communication skills.

4. Humanistic-social studies courses which provide a technician with an informed frame of reference in economics, citizenship, and social relationships.

In summary, a program for educating technicians must include:

1. A clearly defined statement of purposes which is accepted and understood.

2. Institutional commitment on an uncompromising basis of resources necessary to accomplish these purposes.

3. Adequate physical facilities.

4. A highly qualified, willing, and enthusiastic college level staff capable of teaching all of the knowledge, skills, concepts and competencies required of the technician.

5. Students of at least average ability who meet the prerequisites for entering the program.

All of the foregoing are essential to the success of any curriculum to educate technicians. Weakness in anyone of them will lower the quality of preparation of the technicians it is designed to educate, and to that extent present the attainment of the objective of the institution and the personal goals of those who seek education within its walls.

DESIGN SOLUTION FOR TECHNICAL EDUCATION FACILITIES

George Mehallis*

Technical-vocational administrators and instructors should be apprised with some of the basic factors and considerations necessary for planning technical-vocational or occupational education facilities within the philosophy of a comprehensive community college.

Dr. Milton E. Larson, in his presentation to last year's leadership institute, delivered a comprehensive guide in facilities planning for technical education. In order to avoid redundancy, I will delve primarily with the factors which should concern administrators and faculties of technical programs and how they should relate their responsibilities to the campus planner, the administrator, the architect and community college planning committees so that facilities designed are of high caliber and fit the unique role of the community or junior college.

One must recognize that even though each college's programs differ, there are similarities with regard to the planning of facilities that are common to all comprehensive community college plants. Those involved in facilities planning must first recognize the three types of planning necessary in developing educational specifications and how they relate to the educational program, the campus and the community.

Urban planning must first be recognized as to the placing of college facilities within reach of the people of a wide spread metropolis or geographic area. The college site should be located in proper relationship with existing and proposed physical facilities of the community to be served. Considerations should be given to the needs relative to industrial and residential areas, main streets and highways. Convenience to public transit systems and adequate parking areas should be of concern since the accepted concept of community colleges is that they are commuter schools or "drive-in-colleges."

Public-service facilities such as water, gas, telephone, sewer, fire and police protection and

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electricity is of prime importance in the selection of a site. Where a college educational program is highly concentrated in technical and occupational offerings, the administration should be cognizant of the role the technical dean, director or administrator should play in the site selection. The technical director with school and governmental authorities, architect and engineers should work as a team and be totally concerned with information relative to the size of the site, its characteristics, cost, accessibility, environment, long-range implications and site development. These are the concerns of urban planning.

Educational planning requires faculty involvement in defining educational goals, formulating and describing learning processes and producing a guide for planning and design. Where colleges have been conceived and built where the faculty has had no part in the planning process, such action can lead to mediocracy in education and has proven to be costly. Teaching staffs should not be ignored in this planning. A process should be initiated in which department heads discuss basic requirements with their faculties in meeting the needs of each specific educational program. Imaginative teaching theories and innovations should be explored as well as researching how similar needs were met in other places. The immediate faculty, who will be responsible for teaching in these spaces, should be totally involved in initiating the educational specifications for the architect who, in turn, will transpose them into a learning environment. Few architects are experts in education and pedagogy; most resent plans and sketches of rooms, shop, or laboratories--they like ideas. Therefore, it becomes the educator's responsibility to educationally plan the structure through educational specifications, and the architect's job is to provide a design solution. These ideas or specifications should be realistic, and expressed in terms which the architect could understand and interpret into useful, durable and aesthetically pleasing buildings which would enhance the area of instruction involved and improve the image of occupational programs.

The third type of planning, which the technical education administrator should be aware of, is that of *campus planning*. The location of the technical structure in relation to other facilities which meet the needs of the total educational program must not be overlooked. The linkage of facilities such as library-resource center, classrooms and science

laboratories, offices, physical education facilities, student center, book store, cafeteria, parking, egress and ingress to the campus, internal service roads, and public utilities comprise the formulating of a master plan. A detailed inventory of these items plus conditions, resources, needs, and influences by the planners (faculty, school board and architects) provides a firm foundation for the creative planning process. A master plan is influenced by many factors--the educational program, scheduling, growth and finance, technology, geography, climate, the automobile and transit systems, neighborhood characteristics, and community needs. The technical education administrator, therefore, needs to become more acquainted with these three types of planning--urban, educational and campus--than other members of the planning team--for technology erects educational edifices.

In analyzing a master plan, fifty percent of a site is usually devoted to parking with five percent of this figure designated for visitors' parking; recreational and physical education requires approximately twenty-five percent of the site, landscaping ten percent and facilities only fifteen percent. These figures will vary three to five percent depending on the nature of the educational programs and the topography and soil conditions.

Assuming a survey has been made and you know whom you are to serve, where you are going to do it, how many pupils are to be served, and what the curriculum is to be, one may proceed to work on educational specifications remembering that these specifications somewhat insure that you get what you want. It is at this point that the faculty should be involved in planning.

Knowing that the curriculum dictates design--a prime factor in the planning of facilities for technical-vocational education--is the realization that each area has specific requirements which must be met. Further, these programs may vary with the specific training needs of each community. Since the building and other facilities are basically educational tools, they are essential to the educational process and will help to achieve the purposes of the program. Building design is, then, an expression of how the problems and ideas of educational program planning can be solved.

The very nature of technical education is especially unique in that building usage changes and

requires certain characteristics to accommodate the needs of future technological developments. Hence, certain terms used in general design considerations need to be identified.

Flexibility--Construction of a building which can be readily adapted to learning requirements, enrollments and methods of teaching. This term is applied usually to the ability to change the interior building floor plan within a few minutes or a few hours without major structural change.

Convertability--Is thought of as the ability to change the interior floor plan of a building to meet changing conditions in a month, a semester, or a year.

Expansibility--Usually requires the adding on to a facility the new requisites for floor space, utilities on the same level or by addition of another story as additional programs emerge.

A structure may be flexible or convertible in nature through the application of:

- The Module
- Moveable Walls
- Non-Bearing Partitions (cinder block or dry wall)
- Under Floor Duct Work
- Overhead Buss Bars
- Floor Channels
- Utility Corridors
- Dropped Ceiling Space
- Computer Flooring
- Centralized Storage
- Centralized Faculty and Administrative Offices

Environment--Optimum control and balance of acoustics, heating, ventilating, humidity, lighting and color are all factors conducive to the learning process.

Aesthetics--Imagination and creativity to meet emotional as well as physical needs.

Safety--Involves adherence to overall structural safety, traffic control, proper lighting, space for each item of equipment, removal of exhaust fumes, and meeting local fire regulations.

Area and Space Relationships--The proper relationship of each area to others to facilitate traffic flow, reduce noise and confusion, and to compliment programs of similar disciplines requires optimum attention. Ease of movement of supplies and equipment should not be overlooked.

A statement of philosophy and objectives of each subject area of discipline, requiring space and facilities in a new structure or one to be renovated, needs to be stated. The architect needs to know the nature of the activities and the teaching methods employed in each area before he can proceed with the design solution.

Space requirements, numbers, size, and kinds of rooms needed must be identified as well as the types and number of teaching stations. Floor layouts or schematics relative to the placement of equipment and furniture and traffic patterns should be known, as well as auxiliary spaces such as storage, mechanical rooms and offices. Data on each piece of equipment and furniture is required in order that the engineer may adequately meet the utility requirements for each machine.

The time spent by the faculty, the director of campus planning, and the technical education administrators on good educational specifications will save time, money and disappointments later. The relationship with the architect and engineer will be much more congenial and efficient. You are more likely to end up with plans and specifications which will require a minimum of change orders and extras during construction. Such projects usually take twelve to eighteen months in planning and approximately the same amount of time for construction. The educational specifications are an important reference source. No major construction project should be undertaken without them.

NEW PROGRAMS IN TECHNICAL TEACHER EDUCATION

Edwin L. Kurth*

In planning for new preparation programs for technicians for new occupations, a standard procedure is to use an occupational analysis approach. After identification of the new technology field, the employment opportunities and possible supply of workers, a function analysis is made of the knowledge and skill requirements of the position. Besides a definition of the technology, other questions include: What is the function of the organization in which he will work? What are possible changes in knowledge and skill requirements? What other organization may have similar requirements or may employ individuals with similar preparations?

These are pertinent questions which must be asked and answered satisfactorily before proceeding with developments for providing highly skilled personnel through a technical education program. The same kinds of questions can be asked in regard to the preparation of the teachers of technicians for the new technologies. The source and preparation of teachers and instructional materials are very vital to immediate as well as long-range growth and validity of new occupational programs.

To date we have been able to depend in large measure on recruiting instructors from the professions to which the semi-professional or technical occupations related, or drawing technical curriculum content from the professional course sequences and adding thereto the other professional related courses deemed necessary to prepare teachers. We have usually also required a third vital element, technical employment experience for employment as a teacher. This may vary from state to state and may incorporate cooperative work experience gained while completing the preparatory degree.

Private technical institutes such as Wentworth and Franklin have drawn their faculty from engineering colleges and industry. Some of the first colleges and universities to offer baccalaureate degrees for the

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preparation of technical institute type programs were Oklahoma State University at Stillwater, Purdue University, University of Illinois and, on the master's degree level, the University of Florida. There are now numerous other institutions organizing baccalaureate, master's, specialist and doctoral programs in this growing and vital field.

Professional associations and accrediting agencies concur that the overall initial preparation of instructor of technical subjects demands a balance of general, technical and professional teacher education courses combined with appropriate work experience. It is expected that the work experience will be in or closely related to the technology in which the teacher will instruct. In some institutions the individual may get this work experience after his sophomore year and before he enrolls at the upper division level. Purdue University in 1964 included a fourteen-month no-credit work experience which made the technical teaching option of their industrial education degree a five-year program.

The undergraduate programs in the three institutions mentioned are typical of most which prepare teachers of engineering technologies. The total number of hours range from 125 semester hours to 144 and include:

Basic science courses--chemistry, math, and physics	20%
Engineering science, auxiliary courses--drafting, descriptive geometry, strength of materials and statistical dynamics	10%
Technical specialty courses in a technology--courses in electronics or civil technology, etc.	35%
Professional education courses--including intern teaching	15%
General education--humanities, communications, psychology and social sciences	20%

These percentages may vary by institution, but the range still gives a balance to the preparatory curriculum.

The University of Florida offers a master's degree program in which a person may earn his master's in a technical specialty from engineering,

architecture, building construction, agriculture, business administration or health-related services, with a fifteen-semester-hour minor in education. Or the individual with a baccalaureate degree in a technical field may take a master of education degree with a twelve-hour minor in his technical specialty. The education courses include the internship of six semester hours and the two certification courses required of junior college technical instructors.

A number of additional colleges and universities have established both graduate and undergraduate technical teacher education programs including such institutions as Rutgers University, Penn State University, and Colorado State University. A survey of the undergraduate programs reveals similar patterns of preparation with approximately the same percentages of time or credit in the technical specialty areas, math and science, and the auxiliary or supporting courses. Purdue University with their 2+2 plan seem to have established a workable pattern for junior college technical graduates or two-year technical institute graduates to transfer to the baccalaureate program with the technical option. This option may include preparation for teaching through the applied technology teaching sequence. One significant factor in the present programs is that these institutions have compatible colleges of engineering and education.

To prep~e teachers of engineering-related technologies, it would seem evident that this could best be done in institutions which had engineering and education colleges. The same rationale would hold for institutions preparing teachers for the health-related technologies or semi-professional occupations--a strong professional degree preparation program to provide the upper division content courses and the professional teaching courses required.

At a conference on technical teacher education held by the vocational-technical branch of the U. S. Office of Education, the competencies required of teachers of post-high school technical programs were discussed. The competencies fell into three major categories: Technical Subject Content, Pedagogic Preparation and Technical Work Experience. The technical subject content competencies were identified as follows:

1. Ability to use algebra and trigonometry as tools in the development of ideas that make use of scientific and engineering principles; understanding of and facility with

mathematics through analytical geometry, calculus, and differential equations according to the requirements of the technology.

2. Proficiency in the application of physical science principles including advanced concepts and laws of physics and chemistry pertinent to the individual's field of technology.

3. Understanding the materials and processes commonly used in the technology.

4. Extensive knowledge of a field of specialization with understanding of the engineering and scientific activities that distinguish the technology of the field.

5. Communication skills that include the ability to interpret, analyze, and transmit facts and ideas graphically, orally, and in writing.

6. Ability to interpret and apply principles of economics and industrial relations to a technology.

The pedagogic preparation requirements included the usual courses in psychology of learning, curriculum development, classroom procedures, and foundations of education. With this were the requirements for a sound philosophy of the role and function of technical education and intern experience in teaching subject matter from a theoretical and applied point of view.

The technical work experience rated as a very vital requirement for competency as a teacher and would have to be in a setting related to the technology the teacher expected to teach.

Over-riding all these competencies were the concerns expressed at every conference since--how to keep teachers up-dated in their field. Several conferences to attempt to find ways to do this have been held recently. Some of the recommendations have been mentioned. Several suggestions have been to change the entire pattern of teacher preparation. The program patterns mentioned previously have been considered adequate but do not represent much of a change from what has been used the past three decades.

In 1965 the Massachusetts Institute of Technology held a summer study on Occupational, Vocational and Technical Education. The participants divided themselves into five study groups for different topics. One of these was to study teacher education. Dr. N. H. Frank, professor of physics at M. I. T. served as director of the study. One of the primary emphasis of the teacher education group was for the need for interdisciplinary preparation of teachers to enable them to "learn to learn" in more than their specialty area and that curriculums could not be changed without changing teacher education programs.

Dr. Frank, in an address to the annual meeting of the American Technical Education Association at Denver, Colorado, December 6, 1966, outlined some of the changing requirements for technical education which were an outcome of the summer study of 1965 and challenged technical teacher educators to prepare teacher education curricula accordingly. The gist of his topic was that we must prepare people to function in a group of operations all of which have a broad common theme, rather than for specific technical competence that can be applied in only a few industries. He suggested the broad categories of:

Energy conversion systems and operations--electronics, mechanical, thermal, nuclear, chemical, or combination of these.

Communication systems and operations--electronics, acoustics, language, visual aids, computers.

Transportation systems--from simple means of locomotion to mass transportation to space travel.

Materials processing and fabricating operations--construction, chemical processes, synthetics, metallurgy.

Operations and processes concerned with living organisms--health occupations, foods, nutrition, and biological processes.

The study showed common characteristics in all categories such as overlap of techniques, instrumental problems of stability and control, systems operation and computer use. The M. I. T. study group suggested a start on teaching such a curricula as this at the junior high school level to continue up through higher

education in which all students would prepare for an occupation and this would become the focal point for all other cognitive learnings.

Other programs following this same concept are the American industry curriculum at Stout State College, the elementary school tool familiarization program in southern United States, the proposed experimental organic or preparation for living curriculum.

That technologies have commonalities of technical content was substantiated by the University of Illinois Study of Schill and Arnold. Three basic technologies, chemical, mechanical, and electronic were studied plus the three related of chemical-mechanical, electro-mechanical and electro-chemical. This study revealed that a core of courses could be planned which would serve technicians preparing for groups of technologies. New and specific courses for every technical position in industry were not necessary.

The same principles would apply to teacher preparation programs. Since society, the economy and industry require increasing compatability between more and more branches of education at all levels, it should be possible to predict that technology programs will see technicians in their third or fourth or later semester working as a team with senior year engineers in power systems, communication, transportation, or construction. It should be equally predictable that programs for teachers in these new categories will see engineering, education and industry providing a cooperative approach to technical content, pedagogic excellence, and industrial experience. We already know better ways of doing many of the things we need to do and we also know that if we continue to merit increased federal, state, and local support for technical education, we will get it done. No longer should it be more difficult to change a curriculum than it is to move a cemetery.

OVERVIEW OF PRESENTATION ON RESEARCH IN TECHNICAL EDUCATION

J. Paschal Twyman*

Research, in any sophisticated sense, is a relatively new force in education generally and within the field of technical education particularly. Possible reasons for this include: 1.) A general misunderstanding of what research is and can do; 2.) education is a "people-centered" rather than "product-centered" institution and, consequently, the outcomes tend to be more controversial and are more difficult to control and measure; 3.) lack of programmatic financial support for research activities; and, 4.) a severe shortage of trained and interested manpower. Fortunately, significant strides have been made recently which allow us to compensate for and/or overcome these difficulties.

For those interested in stimulating or producing research in technical education, the needs and opportunities are more than available. The primary task becomes one of establishing reasonable priorities and marshalling available resources in such a manner as to increase the probability of successful impact. This involves considerations of problem definition, choice of research approach, and the obtaining of necessary financial support for the research endeavor in question. The function of this presentation is to provide a general framework helpful in achieving these aims.

The difficulties involved in an adequate definition of a research problem are known to all who have ever attempted this responsibility. Required is a unique combination of creativity, persistence and good judgment. Of primary importance is the ability to discriminate between researchable issues and those which are not. Assuming some sensitivity to this factor on the part of the potential researcher, additional steps include a search of the literature for findings which are applicable to the local scene--from either a methodological or a substantive standpoint, and, using this background, the planning of an

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approach which is likely to impinge directly on the problem at hand. At this point, the problem of proposal preparation becomes paramount if outside funding is to be solicited. General background work to be done at this juncture includes becoming familiar with the legislation and the requirements and areas of emphasis of particular granting agencies (this bears directly on manner of presentation), identifying specifically what is to be accomplished by the project (within the limitations of manpower and facilities available) and identifying the individuals who should be involved in the preparation of the proposal (outside consultants, agency representatives, other staff members, etc.). The proposal document itself will generally have most of the following elements:

Introduction (or statement of the problem)--the problem is stated and justified here. Indications are given as to why it is a significant project, including documentation that it is generalizable beyond the local scene. This section makes explicit what will and will not be tackled. This entire section should be brief.

Background and related research--the literature dealing with related activities and projects is summarized in this section. This should demonstrate how the proposed project will build on what is known in the field and how it differs.

Statement of objectives--these objectives should be specific and operational in nature, capable of being accomplished within a specific period of time, and clearly related to the needs for the project as indicated in the introductory statement. It is important here, usually, to talk about project evaluation as one objective.

Procedures--this section describes the manner in which the objectives will be met (how the questions are to be answered, how the hypotheses tested, etc.). This includes issues of variable definition, instrumentation, data collection and data analysis. Also, the timing for the various phases which have been conceptualized is indicated.

Personnel--in this section, background data are provided on each key member of the research team.

Budget--this includes the investigator's best estimate of project costs, including necessary

indirect costs. It also provides information on how cost-sharing provisions are to be met.

At best, proposal writing is a tedious and time-consuming task, and the proposition of finding funds is highly competitive. Yet, it can and is being done. And, a growing body of literature is now available to those who seek assistance. Included in this set of materials would be references and guidelines for the preparation of proposals and current publications indicating which agencies support research of various types. An example of an interesting, and, I think, significant research project in technical education is the study on bio-medical equipment technology now being conducted by the Technical Education Research Center, Cambridge, Massachusetts. This project has several interesting features, including the use of an interdisciplinary research team, and a plan of attack which recognizes the importance of rigorous experimentation in curriculum development. Several other worthy projects may also readily be cited.

Hopefully, the research development progress initiated in recent times can be continued. Only if this happens can we hope to keep pace with the demands of our complex and changing "real world."

PART 4

PRESENTATIONS FROM THE CONNECTICUT INSTITUTE

RESOURCES FOR PROGRAM SUPPORT (ADVISORY COMMITTEES)

Joseph F. Murphy*

Mr. Murphy urged that all participants who contemplate being involved with advisory committees avail themselves of the following reference:

Advisory Committees
Office of Education, Dept. of H. E. W. OE*84009

A. Typical advisory committees at work in Connecticut

   1. Statewide--trade and industrial, agriculture, distribution, office health, manpower, food and lodging, plastics, supervisory, superintendents

   2. By Geographic Area--can be as broad as technologies. Examples: printing, drafting, nuclear, electronics, chemical

   3. Inter-agency Committees--education, health, welfare, labor, office of economic opportunity

B. To be successful, any advisory committee formed must be made aware of a real need of recognized value to members, and must also understand that their function is advisory and does not go beyond this phase.

C. Functions of committees

   1. Help understanding of programs: films, studies, facilities

   2. Projection of needs: health, nuclear, chemical, electronic

   3. Provide support for programs through:

      a. Contact with other business leaders and parents

      b. Curriculum development

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*Mr. Murphy is a state director for vocational education, Connecticut State Department of Education.

c. Financial (support to state boards, politicians, legislature)

d. Staffing and recruitment

4. Evaluation of programs for content, equipmen informed faculties

5. Site--They should have a knowledge of availability, criteria for choosing, and be willing to list five to six possible choices. They must keep in mind future joint use of facilities and be willing to resist the "ideal" site that is frequently thrust upon them.

6. Be ready to identify new most needed areas of concern for new curricula such as: chemical, data processing, nuclear, aeronautical, oceanography

7. Understand facilities and equipment and possibly arrange loan of equipment

8. Support legislation as consumers of the products, the graduates

9. Publicity and public relations--public relations men obtained on a loan from industry can do a tremendous job in publicizing the programs of vocational education.

C. Composition of committees--This will vary according to junction of the particular committee. Following are representative groups from whom members of committees can be drawn: business and industrial organizations such as Connecticut Manufacturers Association, chambers of commerce, industry (presidents and other officers), organized labor, labor department, superintendents, college personnel, principals. (This area may not have been used to full advantage.)

1. Do not include members from political field. They may be invited to attend certain meetings and should be kept informed.

2. Not include members from vocational education. They should act as consultants, do the ground work, handle routine business (minutes, notices, etc.)

D. Sources of names--school directors, superintendents, industrial and business leaders, manufacturers association

E. In addition to especially appointed advisory committees, much help can be obtained from existing organizations as follows:

1. Professional organizations--Connecticut Vocational Association, instructors organization, directors organization

a. These groups have been influential in legislation by bringing information to hearings, contacting legislators, etc.

2. Civic organizations--Rotary, Lions, Kiwanis, PTA

a. Can be sources of public relations. Come to schools for field trips. Provide good contacts in the community. Should be listed on their speakers bureau.

F. Legislative and political support must be sought from all committees and groups.

1. To provide supporting data for State Board of Education approval of new programs.

2. Provide support to the commissioner's presentation at legislative hearings. Can be a source of additional information on costs, students to be served, location.

G. Local and state politicians must be constantly advised about needs, costs and meaning to community.

THE AMERICAN ASSOCIATION OF JUNIOR COLLEGES

Lewis R. Fibel*

The American Association of Junior Colleges was founded in 1920. At that time there were probably 175 institutions in the entire country that might be called junior colleges; their programs were diverse and their status often uncertain.

By 1961 there were 678 junior colleges (405 public and 273 private), enrolling 750,000 students. They increasingly became local institutions opening their doors to larger numbers and greater varieties of students; their curriculums became broader; they developed pragmatic educational programs based on the needs of the whole community rather than on the exclusive needs of students who planned to take their first two years of liberal arts courses in them; they often became community colleges.

Through its journal, by conferences, and through its public information service, the association has endeavored to provide information on orderly planning of multicolleges, campuses, or branches serving large metropolitan areas.

Perhaps the most important extension of AAJC activities has been the development of special projects with foundation funding.

The United States Steel Foundation awarded the association a grant to gather data that would serve as a basis for future efforts at recruiting and training teachers, as well as finding opportunities for those presently in junior colleges to improve themselves.

In 1966, the association received a grant from the Educational Facilities Laboratories for the establishment of a facilities information program aimed at making AAJC a central clearinghouse for assistance and information on facilities planning.

Since 1959, AAJC has been working with universities and the W. K. Kellogg Foundation in the Junior College Leadership Program. This has resulted

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*Dr. Fibel is occupational specialist, American Association of Junior Colleges, Washington, D. C.

in the establishment of graduate centers at ten universities for preparing men and women for administrative positions in two-year colleges.

An especially interesting program was an Inner-City Community College Facilities Conference held in Dallas in December 1966. Conferees--representatives of junior colleges, state agencies, universities, and architectural firms--spent two days intensively considering the types of community college facilities needed to cope with the social and economic problems of people in large urban centers.

The association views its Occupational Education Project under the sponsorship of the W. K. Kellogg Foundation, now in its second year, as a major part of its mission.

Activities and progress this year have been emphasized in the following ways:

1. In identifying manpower needs in many occupational fields.

2. In providing liasion with other associations, agencies and governmental departments.

3. In identifying occupational programs appropriate to the junior college, and in providing encouragement for sound and effective curriculum development.

4. In establishing effective working relationships with professional, educational, and governmental agencies.

5. In developing publications helpful to junior colleges in planning occupational education programs.

PLAN FOR FUTURE ACTIVITIES

A new plan, in addition to the Occupational Education Project, will enable the American Association of Junior Colleges to expand its assistance in the three fields of health-related curriculums, business-related curriculums, and engineering and science-related curriculums. In addition, attention will be given to a fourth field--public affairs and community services. Included in this field are such occupational specialties as: urban management technicians, police science technicians, recreation

supervisors, environmental health technicians, traffic engineering aides, and welfare and family assistance workers.

In addition, the expanded program calls for the publication of curriculum guidelines in occupational education; publication of monographs on service area needs in occupational education; consultant workshops; and regional workshop conferences for occupational curriculum planning and general program development.

SIMULATION IN TRAINING OF ADMINISTRATORS

Raymond Stinchfield*

The dictionary definition of simulation is "the art of pretending that which is not true; feigning." The use of simulation is new for instructional purposes in educational administration but has been widely used in the past, for example: line trainers, war games, auto driving devices, etc.

A 1964 AASA study reported a large number of institutions, offering graduate work for superintendents of schools, were using simulated situations in their teaching program. This use of simulated situations developed from the first simulated school system which became available in 1959.

A typical simulated situation is the "Jefferson Township School District." This consists of a tremendous amount of background material; reports, test results, census reports, school laws, board policies, films, film strips, etc., which take about five hours for exposure and which make the student thoroughly familiar with this fictitious situation. After absorbing this background material, the subject is confronted with a series of "in-basket" items to which he must react. The "in-basket" solutions to problems are later discussed and compared by the participants.

Since 1959 at least sixty-five university departments of educational administration have used the simulated materials for either pre-service or in-service training of school administrators.

Capabilities:

1. There is a high degree of involvement with the participants actually solving problems rather than discussing how the problems might be handled, a classic example of learning by doing.

2. The accumulation of data on solutions provides norms and clinical study of the

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"on-the-job" behavior in identical situations. The causes and consequences of the administrator's action can be examined by critique.

3. Simulation permits the learner to profit from mistakes that might be disastrous on the job. There is also the advantage in permitting experimentation which is frequently not possible on the firing line.

4. The simulated situation can provide the subject with concepts, research evidence, models, and other information which could not be assembled in an actual situation at one time. Theory and practice may be more relevantly and visibly joined in the simulation than in more conventional teaching methods.

5. Simulation provides the opportunity to see the whole picture, to view each problem in broad context. The simulated materials are broad in scope and rich in detail. Variables are not factored out, but examined in their dynamic interplay.

6. Simulation permits a degree of introspection rarely provided on the real job. Simulation holds up the mirror. Subjects report that, as a result of this experience, they can see themselves better as others see them, can deepen their perception of the effects of their behavior on others, and can understand and accept themselves more realistically.

7. The subjects find the simulation an interesting object lesson in simulation which he may find useful in his own school situation, possibly in in-service programs back home.

8. Simulation presents an extremely useful research medium permitting the collection of data on behavior and performance in identical situations. Analysis of the data stimulates the development of concepts and models useful both in research and teaching.

Limitations:

1. Depends very much on competence of the instructor using it.

2. Materials are expensive to produce and are subject to obsolescence.

3. A long period of becoming acquainted with the background materials is needed before in-basket items can be undertaken. At least one week and ideally two weeks should be used for comprehension before solutions.

4. The question of transferability of learning is still unproved.

Simulation at least offers the possibility of replacing book stories and theories with the reality of solving actual problems.

This session ended with the participants taking part in a simulation exercise in which they were given a brief background presentation and then presented with six in-basket items to solve. A group discussion of some of the solutions closed out the brief exposure to an actual simulation exercise.

PROBLEMS OF A PRESIDENT

Donald R. Welter*

The format to be used will be a brief description of present practices at Thames Valley College followed by the problems associated with that particular activity.

Thames Valley State Technical College is one of four state-operated technical colleges in Connecticut concerned solely with the preparation of engineering technicians in chemical, data processing, electrical, mechanical and tool technologies. The graduates receive the associate degree in applied science. Thames Valley at present is the smallest of the four units but two planned additions will bring it on par with the largest (approximately 100,000 square feet).

1. Staff recruitment--Present qualifications call for a bachelor's degree and a minimum of three years of industrial experience. The State Board of Trustees has recently approved a new system of academic ranking for faculty. Present sources of staff include: other colleges, evening program (industry), newspaper advertising, word of mouth references from present instructors.

   Major problems:

   a. We want experienced men but can't pay enough to attract them. The new academic ranking may help because we can bring in staff at a level and salary commensurate with experience.

   b. How can you detect good teacher possibilities during an interview with a candidate with no previous teaching experience (or education courses). Some guidelines or instrument would be most helpful.

2. Student recruitment--Presently handled by director of student personnel who also handles counseling and all student records.

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*Mr. Welter is president of Thames Valley State Technical College, Norwich, Connecticut.

Contact is maintained with approximately thirty sending high schools carrying the following activities: guidance counselors, college night activities, groups of students brought to the college, open house in November at the technical college.

Major problems:

a. Properly identifying the engineering technician program to students, parents and counselors.

b. Proper personnel to do the job. New director of admissions will help relieve present situation.

c. Identifying the proper student and attracting more young ladies.

d. Attracting more students to the very rewarding field of chemical technology.

3. Finances--Only concerned with state, which is only source of funds. Has the advantage of dealing only with one group--the disadvantage of being far removed from the possibility of selling the program. Budgets are prepared biennially and allotment received at local unit annually. Responsibility of local unit to remain within allotment and quarters.

Major problems:

a. The credibility gap between budgets and allotments. (How do you explain to staff an increased program and students and a decreased allotment?)

b. Need more fiscal autonomy at local levels to make reasonable purchases and transfer money for best running of unit.

c. More business type personnel needed in office.

d. Bookstore operation regulations need streamlining.

4. Scheduling--Students are handled in groups taking identical subjects but this situation is changing with more three-year students.

No major problems but believe we will eventually move to offering courses all day and evening (no separate evening program)--schedule by computer.

5. Advisory committees--two types: a.) Overall group used primarily only for building program support; b.) Individual technology committees that meet at both the local and state level.

Major problems:

a. Keeping the overall committee involved, active and interested between building projects.

b. Having the time and staff to keep the individual technology committee informed of changes in the curriculum so they won't feel as though their suggestions are unheeded. Can cause bad feeling if there is no follow-up on their involvement.

6. Accreditation and evaluation--Presently concerned with three groups: Engineers Council for Professional Development, Accreditation Committee of Commission on Higher Education, New England Association of College and Secondary Schools. Real evaluation is by the industries that utilize our graduates.

Major problems:

a. Expense and time with ECPD accreditation. It does not seem to mean anything to guidance counselors and parents.

b. NEACSS means much to high schools but will pose real problems in preserving our program. Will have to move in this direction because of its wide understanding and acceptance.

7. Communications--They must be accurate and fast.

Major problems:

The day after the board of trustees or the legislature passes a bill the local administration is

supposed to have the answer as to how the action will affect the local faculty. Some means of providing swift communication to the local level would be most helpful.

STAFFING FOR VOCATIONAL AND TECHNICAL EDUCATION

John Beaumont*

Some of the problems faced in the State of Illinois with regard to vocational-technical education:

1. There was a definite lack of dialogue about vocational-technical education among the decision makers in the state. This type of education was either unknown or misunderstood by the people in the state who controlled the action.

2. The division, as constituted, did not allow means to utilize all forces on a problem. No coordination of effort.

3. There was a lack of fiscal and statistical data for meaningful planning.

4. There existed an impossible span of control.

Reorganization in Illinois

A. The basis for reorganization

1. The form should follow after the function is determined.

2. The journey may be worthwhile even though the destination is not already identified.

3. Keep the ship moving. You cannot stop to make changes--the programs must move ahead.

B. The chart of the reorganization

Office of Director
1. Fiscal and Statistical

2. Program Planning and Evaluation Unit
3. Program Implementation
4. Program Services Unit
5. Research Coordinating Unit
6. Interagency Program Unit

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*Dr. Beaumont is director of Vocational and Technical Education Division, Board of Vocational Education and Rehabilitation, Springfield, Illinois.

a. Six people report to the director

C. Objectives and functions of the reorganization

The reorganization of the Division of Vocational and Technical Education is intended to achieve the following objectives:

1. Provide an organizational structure to plan and develop a state-wide vocational and technical education program that will serve the manpower needs of the state and the nation, and will enable individuals at all levels of ability to become self-supporting.

2. Provide a staff to implement and supervise various occupational curricula.

3. Encourage and conduct research and development to achieve innovation through such sub-processes as problem identification, model design, experimentation, demonstration, evaluation, and diffusion.

4. Provide ancillary services which will improve the quality and the variety of programs offered.

5. Make available statistical and fiscal information for program development and required federal and state reports.

6. Encourage a coordinated approach to all occupational development using the competencies of every staff member for this purpose.

D. Selecting staff

1. People are hired to fit the functions and needs.

2. All staff members should have administrative ability.

3. Want individuals who respond to innovation, experimentation and research.

4. Look for variety of educational backgrounds and experiences.

5. Want staff who believe it can be done. Not interested in negativism.

6. Staff should be determined to face a situation and attempt improvement.

7. State plan must remain very flexible and people must be flexible and be open-minded to changing conditions.

RESOURCES FOR PROGRAM SUPPORT (FEDERAL PROGRAMS)

John Edwards*

The confrontation with the twentieth century requires additional federal support for technical education as evidenced by the following: 90% of all scientists who have ever lived are living at the present time, more books have been printed between 1900 and 1966 than were printed from 1450 to 1900, one-half of all present professional knowledge will be obsolete in ten years.

Following is a brief review of federal programs available for helping technical education:

I. Community Service and Continuing Education (PL 89-329, Title I)

A. Purpose

1. Use special resources of colleges and universities to assist in solutions of community problems.

2. Strengthen college and university community service programs.

a. Course offerings must be available at the college level.

b. Seminars, etc. for people in public administration, etc.

B. Financing--1968--100,000 to each state and resident population percentage. Matching situation with 75% federal participation.

C. Application procedure--College submits application to state agency or to college which administers the plan.

Additional information can be obtained from the state agency or Bureau of Adult and Vocational Education, Office of Education,

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*Dr. Edwards is program specialist, Department of Health, Education and Welfare, Regional Office No. I, J. F. Kennedy Federal Building, Boston, Mass.

U. S. Department of Health, Education and Welfare, Washington, D. C. 20202.

II. College Library Resources (PL 89-329 Title II A & C)

A. Purpose--Assist colleges in the acquisition of books, periodicals, documents, magnetic tapes, records, etc.--no equipment.

B. Method of distribution--Basic grants to individual institutions--maximum $5,000 on a 50-50 basis. Supplementary grants to individual institutions in the extent of $10 per student (no matching). Special purpose grants.

C. Application: Division of Library Services
Bureau of Adult and Vocational Education
U. S. Office of Education
Washington, D. C. 20202

III. Developing Institutions of Higher Education (PL 89-329, Title III)

A. Purpose--To assist colleges and universities in raising their academic quality, if they are suffering from financial or other reasons, by:

1. Augment teaching resources through National Teaching Fellowships awarded by the commission to well-qualified graduate students or junior faculty members. Fellowships for not more than two years at $6,500 a year plus $400 for each eligible dependent.

2. Provide partial support for cooperative arrangements by which colleges can draw on resources of established institutions by exchange of faculty, new curricula, joint use of facilities.

B. Funds--fiscal 1967, $30 million

C. Apply to and seek information from:

Division of College Support
U. S. Department of Education

IV. Improvement of Undergraduate Instruction (PL 89-329, Title VI)

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A. Purpose--Improve instruction through acquisition of equipment and television apparatus.

B. Distribution--Through state commission on a priority basis.

C. Matching funds with federal share not to exceed 50% except in hardship cases.

D. Application through state commission and information from:

Equipment Grants Branch
Division of College Facilities
Bureau of Higher Education
U. S. Office of Education

V. Higher Education Facilities Act of 1963 (PL 89-204 Title I, II, III)

A. Purpose--Assist colleges in construction, renovation, rehabilitation of facilities (academic only)

Title I--Grants for undergraduate construction
Title II--Grants for graduate construction
Title III--Loans for construction

B. Distribution--States administer program through state commission. Institutions apply to state commission.

1. Grants to community colleges or technical institutes shall not exceed 40% of the eligible cost.

2. Grants to other eligible institutions shall not exceed one-third of eligible cost.

3. Loans may not exceed 45% of eligible cost.

C. Applications--Grants filed with state commission; loans filed with the U. S. Office of Education.

D. Information from:

Division of College Facilities
Seventh and D Sts., S. W.
Washington, D. C. 20202

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PART 5

PRESENTATIONS FROM THE CALIFORNIA INSTITUTE

THE NEW LEADERSHIP ROLE OF THE OFFICE OF EDUCATION

Graham Sullivan*

I see I am scheduled to speak on the new leadership role of the Office of Education. The word, "new," is a good word. Only four years ago the Office of Education had a staff of four to five hundred, and programs budgeted at about $4 million. Today, it is responsible for administering program funds of $4 billion, with approximately 3,000 employees. We have about seventy-five different programs, seventy-five different bases of legislation. This complexity complicates the task at the local level.

Significant changes have taken place in the last few years. For example, we now have a document we revise every six months--a fact book. It contains a short summary of each of the seventy-five programs administered by the U. S. Office of Education. This should be of great help to administrators.

Let me tell you of some things we are beginning to undertake. First, our posture in the Office of Education with state departments of education, local educational agencies, and institutions of higher education:

1. By statute and constitution, education is a state responsibility. The Office of Education provides to and through the states the materials for best possible education.

2. This we do as efficiently as is consistent with the Office of Education standards and responsibilities.

3. We concern ourselves with certain national problems that cross state boundaries.

We are working on time tables--the legislative and appropriations time tables. Budget program planning in state education departments is not meshed with legislative action and budgeting. This is a key problem, and we are looking ahead to try and find a way to meet this issue.

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*Mr. Sullivan is deputy U. S. commissioner of education, U. S. Office of Education, Washington, D. C.

(At this point, Mr. Sullivan made some off-the-record comments on desirable and possible changes in timing to meet state budgeting needs.)

As we look ahead, what are we doing to provide educational leadership? We are establishing regional offices, nine of them, throughout the country. We are transferring to these regional offices certain programs--entire operations--grant applications, audit procedures, etc. We are moving from region to region, completing transfer by regions. We are doing this for four reasons:

1. The job in Washington is just too big to do in Washington.

2. We can make better decisions, closer to the client.

3. We hope we can pursue our efforts to strengthen state education departments by being closer to them; achieve more efficiency; make wiser use of funds.

4. We have been charged with disbanding some of the units in our department that have been providing leadership. We have been charged with money management. We haven't the funds to give much time to more than money management. This will enable us to recapture leadership roles in many other fields through work with the state education departments.

We are preparing to implement decisions through a data system. We have been unable in the past to get needed data to members in our bureaus. We are attempting a new approach in order to give some visibility to specialized areas within the Office of Education. We have borrowed the production management concept from industry, using a small staff to work on such special projects as education for the Mexican-American. We will not have anything to do with operations, but as a program manager will become an advisor to the commissioner.

Looking ahead to new kinds of legislation forthcoming: 1.) The major thrust is toward providing leadership in the Office of Education. Our role is to provide resources to and through the states. This whole concept, to strengthen manpower resources in education, is a major effort. 2.) To expand and further develop and use more effectively our resources. We have $100 million in the Office of Education for

research. Compared with what industry spends, this is nothing. Maybe we are using our research dollars in a fragmented way rather than concentrating on major problems. Some of our major problems will be to get the research money we need. Perhaps research money can be included in funds allocated for programs.

Another forthcoming project is to offer additional student financial aid programs. This will be one of the areas where we will be directing our attention.

We think our job is to take the leadership in getting Congress to recognize our needs and get the funds down to you, so you can do a better job of educating youngsters throughout the country.

PUBLIC RELATIONS

F. Parker Wilber*

I would like to start by giving you a definition coined by Edward L. Bernays, who often is considered the founder of the art and craft of public relations. In a little book named The Engineering of Consent,[1] a book that every one of you would find useful, he said that "Public relations is the attempt by information, persuasion, and adjustment to engineer public support for an activity, cause, movement, or institution."

I think this is an important statement. I believe the test of leadership is primarily public support. One of our weaknesses in technical education is that we have not emphasized public support. I assume that our goal is better overall recognition for the values of technical education and more prestige for vocational curricula. If so, we had better analyze and strengthen our current practices in educational communications, public relations, and publicity.

The function of school public relations is telling the public what happens when the individual learner and the curriculum come together. This implies that the ingredients for public relations are present in every school, just as the agents of public relations are present--pupils, teachers, clerks, alumni, administration, committee personnel. All of these agents speak for or against the school in their daily activities and attitudes. All your staff must be courteous in dealing with the public, for example. We have developed specific instructions on handling referrals, to cope with this requirement.

The advisory committee is a primary tool for public relations and if you don't make use of it you are short-changing your P.R. program. We find we can get top people on committees by asking them to participate--it's a matter of prestige with them.

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*Dr. Wilber is president of Los Angeles Trade Technical College.

[1]Edward L. Bernays, The Engineering of Consent (Norman, Oklahoma: University of Oklahoma Press, 1961).

Then, use them to speak for you whenever you need a spokesman, be it at budget hearings or in business and industry gatherings. Involve them in task forces, industry-education councils, Career Days and Industry Fairs and exhibits, in graduation ceremonies. Encourage them to give scholarships and prizes and to donate supplies and equipment. And keep them abreast of what is going on in the school. Community leaders need to be informed. If you don't touch the power structure in your community, you won't get things done.

There must be communication at all levels with the schools whose graduates move on into vocational-technical programs. Visit high schools; talk to administrators and teachers, and to students. Invite them to visit your school; stage special events to attract them. Emphasize that we are essential to the economic field; a 1961 San Fernando Valley employment survey,[2] for example, revealed that only 17 out of some 800 companies surveyed maintained staffed training departments. If industry is to recruit trained workers, it is up to us to supply them.

So far, I have mentioned only the kind of communication that is basically public relations. One effective tool for your P. R. efforts is publicity--in newspapers, on radio and television. Sports events may make good copy but they don't build the image of the school as a training-ground for good jobs. Here's where special events come in--the fairs, exhibits, ceremonies, awards and other activities that enhance the image of your school, and of vocational education as a whole.

I think what I am trying to say is that there is a tremendous amount of misinformation, confusion, and negative thinking about vocational-technical education, and it is up to each of us, for the good of his school and of the field, to counter this with positive facts, prestige facts, in contacts with all of our publics. I know we will find the media of publicity receptive if we have well-defined goals and present our activities with due regard to the timing and other media requirements.[3] Don't hesitate to suggest a story to

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[2]Stanley Warburg, San Fernando Valley Employment Survey (Los Angeles, California: Los Angeles Junior College District, 1961).

[3]Alexander N. Streloff, Guide to Public Relations for Junior Colleges (Burlingame, California: South-Western Publishing Co., March 1961), (Monograph No. c-8).

a newspaper or news commentator--education news is among the best-read items in your daily paper.

As leaders, we cannot attain lasting success for our programs nor expand the reach of technical education (regardless of federal funding) unless we become more conscious of public relations. John Gardner has stated this as our major task ahead:

> The reinterpretation of the ever-recurring interest in vocational preparation . . . should be a current pressing concern for our educators, economists, and statesmen. It may well be that a workable fusion of vocational and general education, and the recognition of the equal value of both, will be one of this country's major contributions to a new concept of democracy in education the world over.[4]

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[4]John Gardner, Excellence: Can We be Equal and Excellent Too? (New York: Harper, 1961).

LEADERSHIP--THE ROLE AND RESPONSIBILITY

Don Wilson*

Leadership responsibility is definite and consistent regardless of the level at which you serve. Your role will vary according to your position in your state or district, but the factor that is consistent is the existence of the leadership role in every position and the realization that this role must be recognized and felt.

Among the desirable and necessary traits for leadership are intelligence and ability, the desire to succeed (the leader is a self-starter and a quick finisher), managerial ability, and the ability to deal effectively with people individually and in groups. Also important are enthusiasm and involvement--involvement with administrators, students, organizations, teachers, community groups.

It seems to me, from what you tell me, that you tend to be too specific in defining your responsibilities. We have to think in terms of how well we are training people for jobs. In many leadership situations, one should take a certain amount of time to evaluate role fulfillment and the importance of subject matter identity. When we generalize vocational education, we are back in a general education program. You have to bring it down to the occupational level.

The U. S. Office of Education now has a tendency to generalize and to employ generalists in trade and vocational education. The states also seem to be following this course. There is danger of losing subject matter identity. It is essential to program to maintain strong subject matter identity.

It is obvious in any consideration of generalist versus specialist that the local supervisor has to be a generalist, but he must be guided by an advisory committee with specialist knowledge in a variety of fields. And I agree with the comment one of you made

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*Mr. Wilson is chief of the Bureau of Agriculture Education of the California State Department of Education.

that if there is a research project to be carried out, better assign it to a specialist.

I would like to make a few comments about "leadership by committee." What would happen if we could operate for a year without a committee or a meeting? Perhaps we would make a real breakthrough in leadership. We see a good deal of leadership by committee in our educational institutions. Perhaps this is designed to insure democratic decisions and protect academic freedom. But it seems to me that we hear enough about democracy and freedom, and too little about responsibility.

Effective leadership must emphasize responsibility. Any discussion of leadership without reference to decision-making would be remiss. Procrastination is deadly to decision-making. It has been said that if you are going to make a mistake, make it fast.

In conclusion, I urge you to devote some time to considering your role as a leader in technical education, to assume your proper role, and to accept the responsibility that goes with your leadership role.

SUPERVISORY STAFFING AND EVALUATION

Albert E. Jochen*

The basic problems inherent in staffing and evaluation, whether it be in education at the state or local level or in business or industry, have points of similarity. Each, if they are concerned with efficiency and effectiveness, must be predicted on:

1. Established short and long-range goals
2. Assessment to determine where you are in relation to the established goals
3. Master planning to implement the goals including such items as:
   a. Essential strategies
   b. Duties and functions of staff in relation to goals
   c. Accepted principles
4. Continuing evaluation

Probably one of the greatest weaknesses of any state department of education lies in its inability to produce succinctly stated short and long-range goals for vocational education which have been officially adopted by the state board of education.

Without such officially established and adopted goals for vocational education, realistic evaluation is almost impossible. The best that one can do is to resort to the traditional technique of assessing personnel, positions, and programs using check lists of criteria which presumably represent the ideal situation. The validity of the entire process rests upon the professional abilities and experiences of those developing, selecting, and assessing the criteria. Such traditional assessing devices are not adequate or realistic in meeting the demands of a democracy which has as its goal the education and

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occupational training of all its people up to the limits of their God given talents and abilities.

As a first step in staffing or evaluating, goals must be developed and adopted. Once such goals are established, then criteria can be developed to assist in assessing where you are at present in relation to the goals in terms of personnel, positions, and programs. A vocational "bench mark" can be established, and progress or the lack of it may be measured from this established point. No one can deny that such "bench marks" in every area of occupational education and training are sorely needed at federal, state and local levels. The effective and efficient expenditure of funds and professional time and energy demand our establishing such "bench marks."

The establishment of goals and "bench marks" make the development of a master plan not only easier but imperative. The implementation of the master plan requires the study of various strategies essential to achieving the goals. Such strategies will, of course, be predicated upon an intelligent assessment of relevent data in terms of critical indicators, potent variables, and possible "road blocks" or obstacles to achieving the goals.

Established goals assist materially in identifying realistic staff needs and the specific qualifications, duties and functions of the position required to implement the goals. Once the position requirements are outlined in terms of the goals, recruitment of personnel, the up-grading of existing personnel and the essential in-service training necessary to meet the goals becomes easier to visualize and accomplish.

The implementation of goals requires not only personnel but principles. Vocational education, no matter at what level, or in whatever field of occupational education and training, ceases to be effective when it disregards or abandons sound principles of operation which have been tried and proven effective. This does not mean sticking to tradition for tradition's sake and avoiding the innovative. On the contrary, the good vocational educator was and is and shall be the innovator on the educational scene. Occupational guidance, placement and follow-up, techniques in the development of occupational curricula, individual instructional materials, methods and devices are tangible evidence of the innovativeness of the vocational educator.

In the dynamic world in which we live, goals for vocational education, like the horizon, recede as you approach them and compel you to set your sights on new and more challenging goals essential to meeting the needs of an ever improving and expanding democracy. Thus, continuing appraisal and reappraisal must take place and the vocational education program must have this built into it or it will die.

PART 6

ERIC PRESENTATION

EDUCATIONAL RESOURCES FOR VOCATIONAL-TECHNICAL EDUCATION

Celianna Wilson and Robert White*

The following presentation is a brief description of the ERIC system in general and the ERIC Clearinghouse for Vocational and Technical Education in particular. It is designed as a basic script to be used with transparencies made from the included illustrations. The basic purpose of the presentation is to provide a vehicle by which appropriate leaders in vocational and technical education can inform others in the profession about the utility of the ERIC system. The presentation is based on the conditions as of February, 1968 and will be subject to change as further developments occur in the system.

For many years, all facets of the total educational profession have recognized the need for an organized method or system of storing and retrieving pertinent information when it was needed. Recently, the Educational Resources Information Center (ERIC) was established within the U. S. Office of Education to provide a national information acquisition storage, retrieval and dissemination system for the total educational community.

Illustration 1:

In March, 1966, the ERIC Clearinghouse for Vocational and Technical Education was approved and funded as part of the Center for Vocational and Technical Education, located at The Ohio State University, Columbus, Ohio. The information storage, retrieval and dissemination function of the clearinghouse fulfills the third objective of the Center as shown in this illustration. At the present time, eighteen clearinghouses have been designated to be responsible for the acquisition, storage, retrieval and dissemination of materials in particular substantive areas of education; and it is likely that

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other ERIC Clearinghouses will be established as future needs are identified.

Illustration 2:

The relationship among the clearinghouses and the central ERIC organization is represented schematically in this illustration. Central ERIC is represented as the hub of this group while the clearinghouses are represented by their identification letters within the smaller ovals. For example, VT are the letters used by the Vocational-Technical Education Clearinghouse; AC represents the Clearinghouse on Adult and Continuing Education; and if we will look at the lower portion of the illustration, the letters JC are used to represent the Junior College Clearinghouse. The letters used to represent each of the clearinghouses will be identified in the next two transparencies. Each of the clearinghouses is responsible for a particular substantive area and is responsible for acquiring, processing, and forwarding all appropriate materials within their scope to Central ERIC for further processing. Acquired documents are abstracted and index terms are assigned at the clearinghouses. They are then forwarded to Central ERIC for computer processing of the abstract, bibliographic information, and descriptors, commonly called retrieval terms. The original document is then forwarded to the ERIC Document Reproduction Service for filming and processing to microfiche form.

Microfiche is a flat form of microfilm, approximately four inches by six inches in size, each microfiche containing the images of up to seventy pages of the original document. The microfiche provides a convenient and economical method of storing and transmitting information. Further, it is economical to the user in that individual copies of microfiche--representing sixty to seventy pages of the document--sell for twenty-five cents each. Hardcopy can also be produced from the microfiche when desired to provide an approximately two-thirds size reproduction of the original material. This hardcopy version of the ERIC documents is available for four cents per page, and requests must be for complete copies only of specified documents.

Illustration 3:

The identifying letters, the title of the clearinghouse and the location for eight of the ERIC clearinghouses is presented in this illustration. For example, AC is the Clearinghouse on Adult and

Continuing Education, located at Syracuse University, Syracuse, New York; and AL represents the Clearinghouse for Linguistics and the Uncommonly Taught Languages located at Washington, D. C. This list continues to FL, representing the Clearinghouse on the Teaching of Foreign Languages, located in New York City. We have the remaining

Illustration 4:

clearinghouses represented in this illustration. As stated previously, JC represents the Clearinghouse for Junior Colleges, located at the University of California, Los Angeles, and the list continues through the remainder of the eighteen clearinghouses.

One of the major products of the ERIC system, and the primary vehicle by which information is announced to persons concerned with educational resources, is the monthly publication of Research in Education. This computer-generated

Illustration 5:

publication of Central ERIC is printed and distributed by the Government Printing Office and is available by subscription for $11 per year. Each issue of Research in Education, or RIE as it is sometimes called, contains information on completed research and on-going research.

The information on completed research is announced in the form of resumes containing the abstracts and descriptors of documents processed through the ERIC system. In addition, there are several indexes which make it possible for the users to locate information on specific topics or by certain authors.

The information pertaining to on-going research is also reported in RIE in the form of resumes of projects as they are funded. These are presented in the form of abstracts and descriptors so that one may be aware of current research. In addition, there are also several indexes to allow one to conduct searches for current research.

The VT-ERIC Clearinghouse at The Center for Vocational and Technical Education is also using publications as the primary means of disseminating information. The two publications currently produced by the Center are

Illustration 6:

Abstracts of Instructional Materials in Vocational and Technical Education, AIM, and Abstracts of Research and Related Materials in Vocational and Technical Education, ARM. These publications are produced on a quarterly basis, starting with the fall, 1967 issues, and are available as two separate series. The instructional materials series, AIM, primarily reports instructional materials that have been acquired and processed at the clearinghouse, while research and research-related materials are reported in ARM. Either series is available by subscription from The Center for Vocational and Technical Education at a cost of $9 annually. Both of these series report information that is available in vocational and technical education and includes multiple indexing of the major concepts of the documents announced in each issue, an author index and a document number index.

Illustration 7:

This illustration more clearly presents the relationship of the various publications. In this illustration, Central ERIC is represented by the letters E R I C within the circle, while the VT-ERIC Clearinghouse is represented by the letters V T in the upper left portion of the illustration. As may be seen, processed documents are input to ERIC by each of the eighteen clearinghouses. For the sake of illustration, we have separated the VT Clearinghouse from the other seventeen clearinghouses. The materials from all of the clearinghouses are forwarded to Central ERIC and announced in Research in Education on a monthly basis. The outline of another publication, symbolized by the dotted line, represents other publications of Central ERIC. An example would be the ERIC Collection of documents concerning Disadvantaged Youth. Concurrently, the documents processed by the VT-ERIC Clearinghouse are included for announcement in AIM and ARM. The other unnamed publications in this illustration would represent such items as the research review and synthesis series of the VT-ERIC Clearinghouse, which includes a review and synthesis of research in: agricultural education, business and office occupations, distributive education, home economics education, industrial arts education, technical education, and trade and industrial education.

In Research in Education, or in any of the other ERIC publications, the principle means of transmitting information about a document is by means of the resume. There are four major sections in the resume shown in

Illustration 8:

this illustration; the first consisting of the clearing-house and the ERIC identification, followed by the bibliographic information, the descriptors, and the abstract.

Looking again at the first section of the resume, this document is identified as VT 000 453 and also as ED 012 313. The ED 012 313 identification is the number you would use to obtain a copy of this document from the ERIC Document Reproduction Service, frequently referred to as EDRS, if a copy of this document is desired after reviewing the resume.

The second section of the resume includes the bibliographic information. Typical information includes the title, the personal author or authors, the source of the document or the publisher, publication date, which in this case is sixty-four representing 1964, pagination--we see on the last line of the second major section ninety-one pages which accounts for all printed pages including the cover--and the price for copies of the materials from EDRS. The last line in this section is an availability statement and gives you the price for obtaining the microfiche copy or the price of hard-copy from ERIC Document Reproduction Service. Additional information regarding orders from ERIC Document Reproduction Service may be obtained from any recent issue of Research in Education or by contacting the ERIC Document Reproduction Service, The National Cash Register Company, Box 2206, Rockville, Maryland 20852.

The third section of this illustration identified the descriptors assigned to this document for retrieval purposes. The major concepts are: industrial education, technical education, vocational education, curriculum planning, teacher education, and in-service teacher education. Central Michigan University, Michigan is also given in this resume since the information in the original document relates to this institution. The descriptors with the asterisk; for example, industrial education, technical education, vocational education, teacher education, and in-service teacher education, represent the major concepts of this document and would be the terms used in the index of an ERIC publication reporting this document.

The final section is an abstract section and provides an abstract of approximately 200 words or

less to describe for the reader the content of this document. If there is a publishing source which sells this document, this information is included at the end of the abstract. Whenever a hardcopy is desired, be sure to check this source since the cost will be less than the EDRS hardcopy shown above. EDRS hardcopy is a back-up resource when copies of the original document are out of print or are no longer available.

Illustration 9:

This illustration shows another example of a resume. The most noticeable change is that this document has a VT number only and no ED designation. Since this document does not have the ED designation, it would not be included in Research in Education, but would be announced with the other documents in an issue of Abstracts of Research and Related Materials in Vocational and Technical Education.

One might visualize the general concept of the ERIC system as a closed cycle.

Illustration 10:

This illustration depicts several users forwarding information to the VT Clearinghouse. Information received and processed by the clearinghouse is announced in the two publications, AIM and ARM, and thus would be available to the user in the appropriate microfiche collections. Many of the same materials would be forwarded to Central ERIC where they would be announced in Research in Education and would subsequently be available as individual documents on microfiche or as hardcopy from EDRS. Microfiche of the items in AIM or ARM without the ED designation may also be obtained from EDRS, but not as individual documents. In order to provide microfiche of AIM or ARM documents, the materials announced in each issue will be continuously filmed and placed on microfiche under a single ED number. This permits anyone to obtain the microfiche collection for any single issue of AIM or ARM from EDRS. In some states certain agencies will obtain these collections and the equipment to reproduce microfiche or hardcopy of individual documents. Some state educational agencies are interested in providing this service; however, the names of agencies developing this capability have not been identified at this time. Several indexes to the materials are also included in each microfiche collection. The arrows in the illustration between ARM and EDRS depict documents from a single issue of ARM being input under one ED number; AIM would be treated

in the same manner. Items being input from Central ERIC receive an individual ED number for each document. An arrow from the circle with Research in Education and EDRS directed back to a user shows the completed cycle.

The future success and usefulness of the ERIC system will be dependent upon the flow of useful materials into the system. This input of materials must come primarily from the individual members of the educational community.

Illustration 11:

The kinds of materials being solicited by the VT-ERIC Clearinghouse is given in this illustration. This includes two copies of research or research-related materials which you feel may have some impact on vocational and technical education. Examples of the types of materials desired are: instructional materials, research reports, conference reports, bibliographies, and so forth. Any person who has copies of these types of materials or who is involved in the production of materials pertaining to vocational and technical education should forward two copies of each document to the ERIC Clearinghouse for Vocational and Technical Education. In return, the products available to you would include Abstracts of Research and Related Materials in Vocational and Technical Education, or Abstracts of Instructional Materials in Vocational and Technical Education, synthesis and review papers on selected topics, microfiche or hardcopy or individual documents, and bibliographies.

Illustration 12:

The materials should be directed to the attention of the Acquisitions Specialist at the ERIC Clearinghouse, Columbus, Ohio. Other inquiries or comments regarding the vocational and technical ERIC clearinghouse should be directed to the attention of the Director, the Coordinator, Retrieval Specialist, or indexing-abstracting Editor at the address shown in this illustration.

ILLUSTRATION I

THE CENTER FOR VOCATIONAL AND TECHNICAL EDUCATION

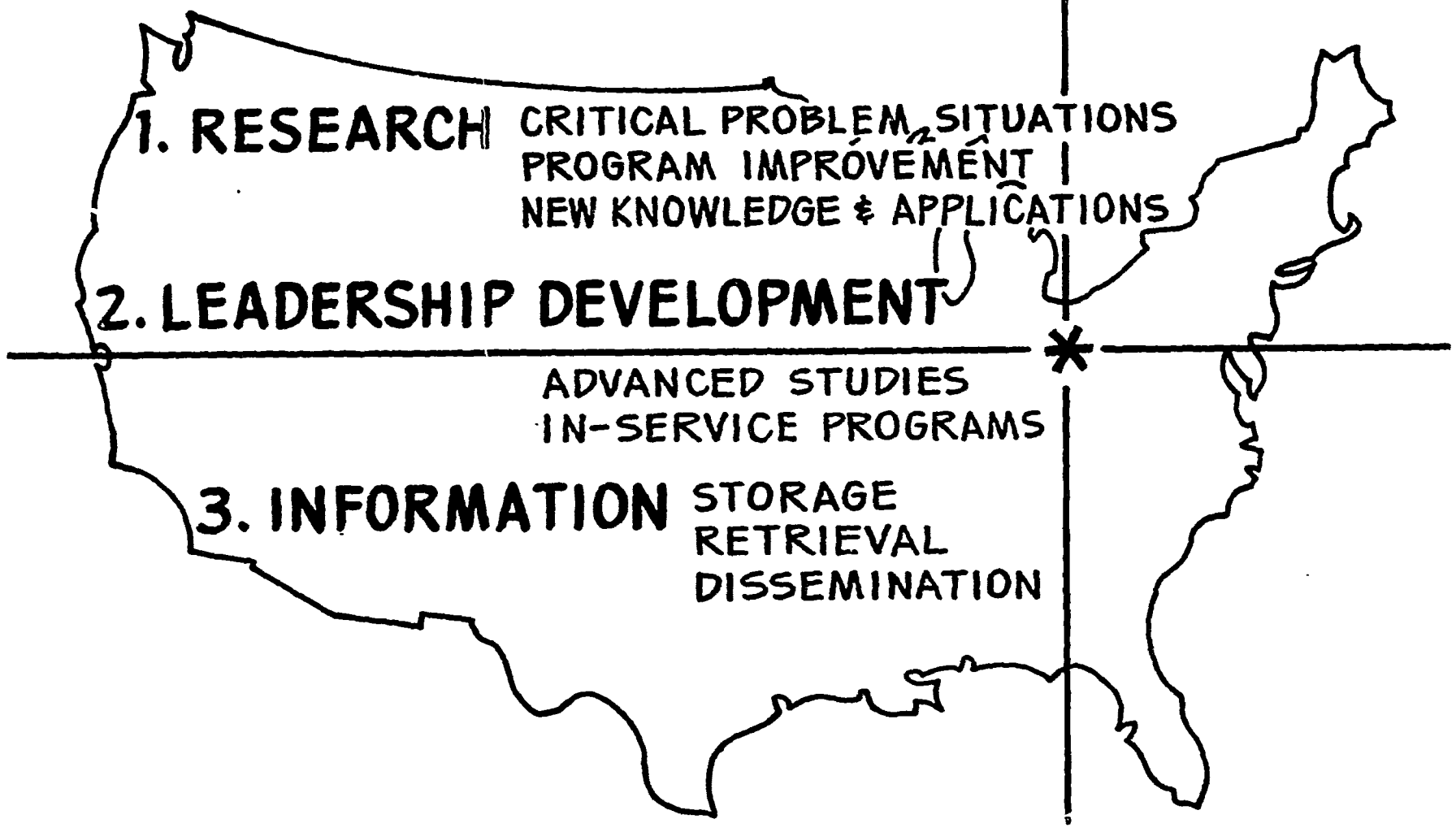


ILLUSTRATION 2

THE ERIC SYSTEM

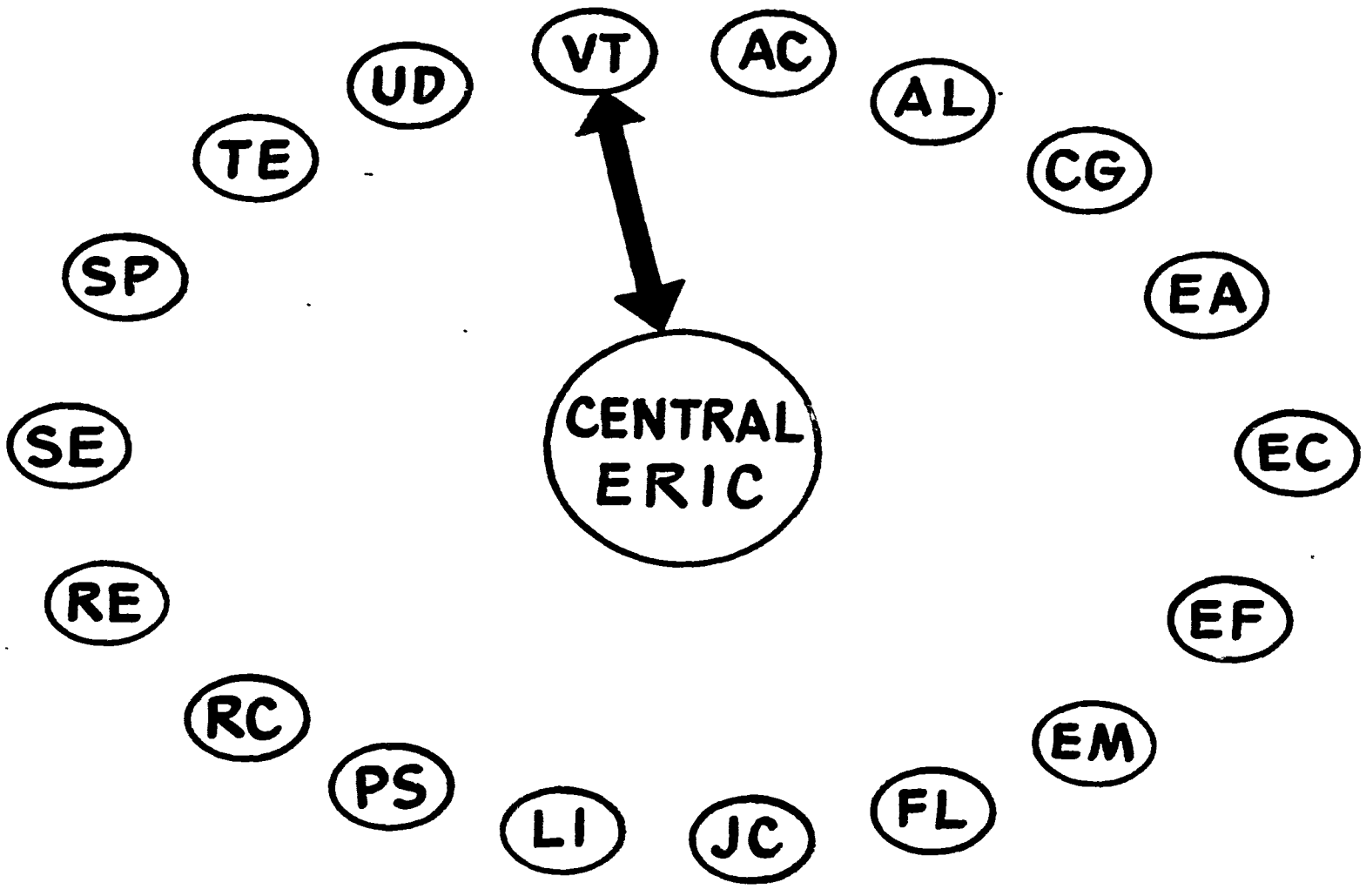


ILLUSTRATION 3

AC ADULT AND CONTINUING EDUCATION -
SYRACUSE U. - SYRACUSE, N.Y.

AL LINGUISTICS & THE UNCOMMONLY TAUGHT LANGUAGES
CENTER FOR APPLIED LINGUISTICS-WASH., D.C.

CG COUNSELING AND PERSONNEL SERVICES
UNIV. OF MICHIGAN, ANN ARBOR

EA EDUCATIONAL ADMIN.-U. OF OREGON-EUGENE

EC EXCEPTIONAL CHILDREN-COUNCIL OF
EXCEPTIONAL CHILDREN-WASHINGTON, D.C.

EF EDUCATIONAL FACILITIES-U. OF WISC.-MADISON

EM EDUCATIONAL MEDIA AND TECHNOLOGY
STANFORD UNIV.- STANFORD, CALIF.

FL TEACHING OF FOREIGN LANGUAGES - MODERN
LANGUAGE ASSOC. OF AMERICA-NEW YORK

ILLUSTRATION 4

JC JUNIOR COLLEGES - U. OF CALIF. - LOS ANG.

LI LIBRARY & INFORMATION SCIENCES
U. OF MINNESOTA - MINNEAPOLIS

PS EARLY CHILDHOOD - U. OF ILLINOIS - URBANA

RC SMALL SCHOOL & RURAL COMPENSATORY
EDUCATION - NEW MEXICO ST. U. - LAS CRUCES

RE READING - INDIANA U. - BLOOMINGTON

SE SCIENCE EDUCATION - OHIO ST. U. - COLUMBUS

SP SCHOOL PERSONNEL - CITY U. OF NEW YORK

TE TEACHING OF ENGLISH - NATIONAL COUNCIL OF
TEACHERS OF ENGLISH - CHAMPAIGN, ILL.

UD URBAN DISADVANTAGED - YESHIVA U. - NEW YORK

VT VOCATIONAL AND TECHNICAL EDUCATION
OHIO STATE UNIV. - COLUMBUS

ILLUSTRATION 5

INFORMATION ON COMPLETED RESEARCH

ABSTRACTS

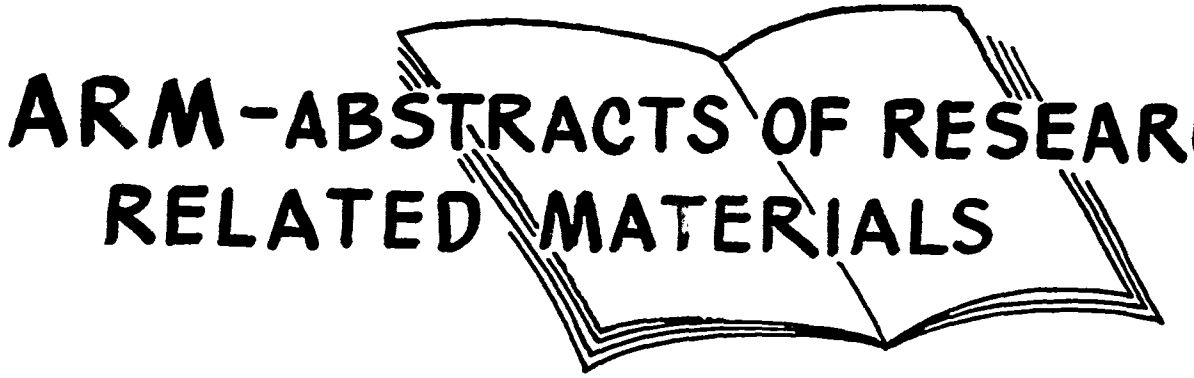
INDEXES

INFORMATION ON ONGOING RESEARCH

ABSTRACTS

INDEXES

ILLUSTRATION 6



REPORT INFORMATION AVAILABLE
MULTIPLE INDEXING OF TOPICS

ILLUSTRATION 7

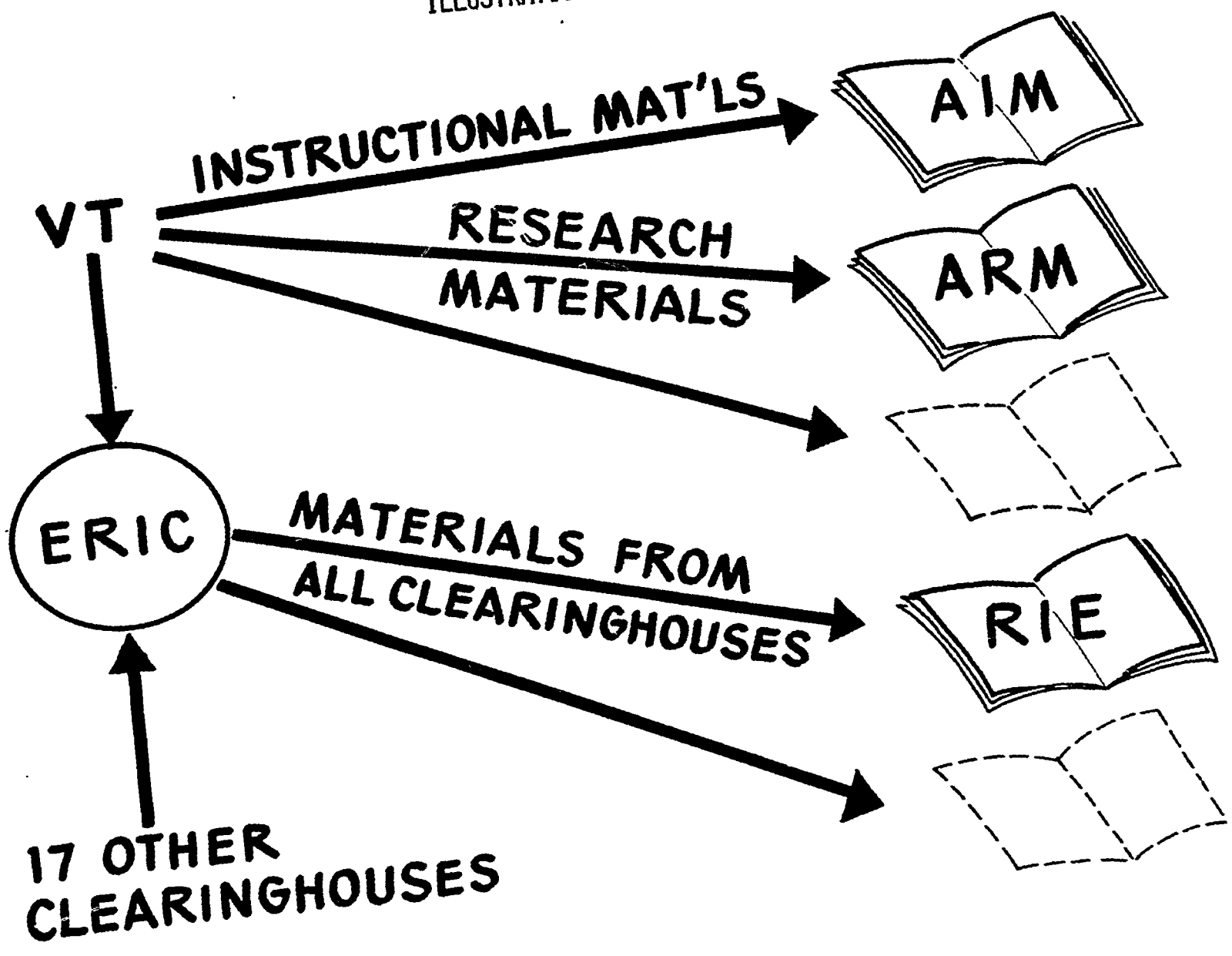


ILLUSTRATION 8

VT 000 453 ED 012 313

The Partnership Vocational Education Project, A New Program in Industrial-Technical Education, A Proposal Presented to and Accepted by the Ford Foundation.

Minelli, Ernest L.

Central Michigan Univ., Mount Pleasant

65

EDRS Price MF-$0.25 HC-$0.68 17p.

*INDUSTRIAL EDUCATION, *TECHNICAL EDUCATION, *VOCATIONAL EDUCATION, CURRICULUM PLANNING, *TEACHER EDUCATION, *INSERVICE TEACHER EDUCATION,

Central Michigan University, Michigan,

The proposed program to improve industrial-technical education will [illegible] school. In grades 9 and 10 the program will consist of a study of American industry. In grades 11 and 12 there will be a 2 year sequence of four MIBO credits in English, science, mathematics, industrial [illegible] social subjects

ILLUSTRATION 9

VT 000 460

Report of Second Research Coordination Conference on Agricultural Occupations. January 13-15, 1964, The Ohio State University, Columbus. Summarization Procedures. Guidelines for Pilot Programs.

Ohio State Univ., Columbus. The Nat. Center in Agr. Educ.

64

EDRS Price M/F Available in VT-Eric Set 91p.

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*AGRICULTURAL EDUCATION, *RESEARCH METHODOLOGY, *OFF FARM AGRICULTURAL OCCUPATIONS, DATA PROCESSING, *PILOT PROJECTS, GUIDELINES, EVALUATION METHODS,

---

The primary focus of this conference [illegible] for agricultural [illegible] and guidelines for pilot programs [illegible] by approximately 35 persons [illegible] 21 [illegible] the U.S. [illegible] of Education. The major [illegible] are -- (1) [illegible] for agricultural occupations data (2) [illegible], and (3) guidelines for pilot programs in agricultural education. The [illegible] definitions of employment levels in-[illegible] of selected [illegible]

ILLUSTRATION 10

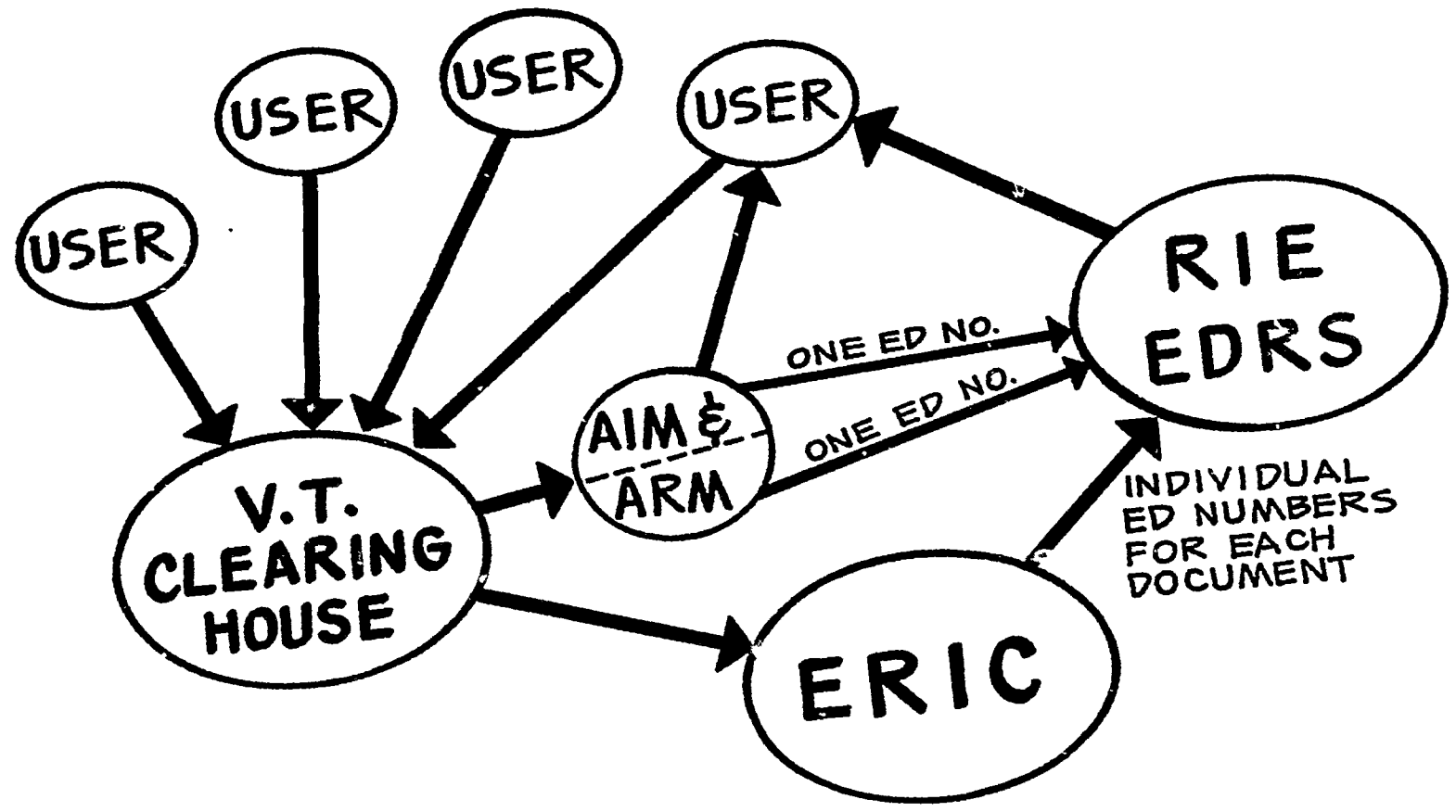


ILLUSTRATION 11

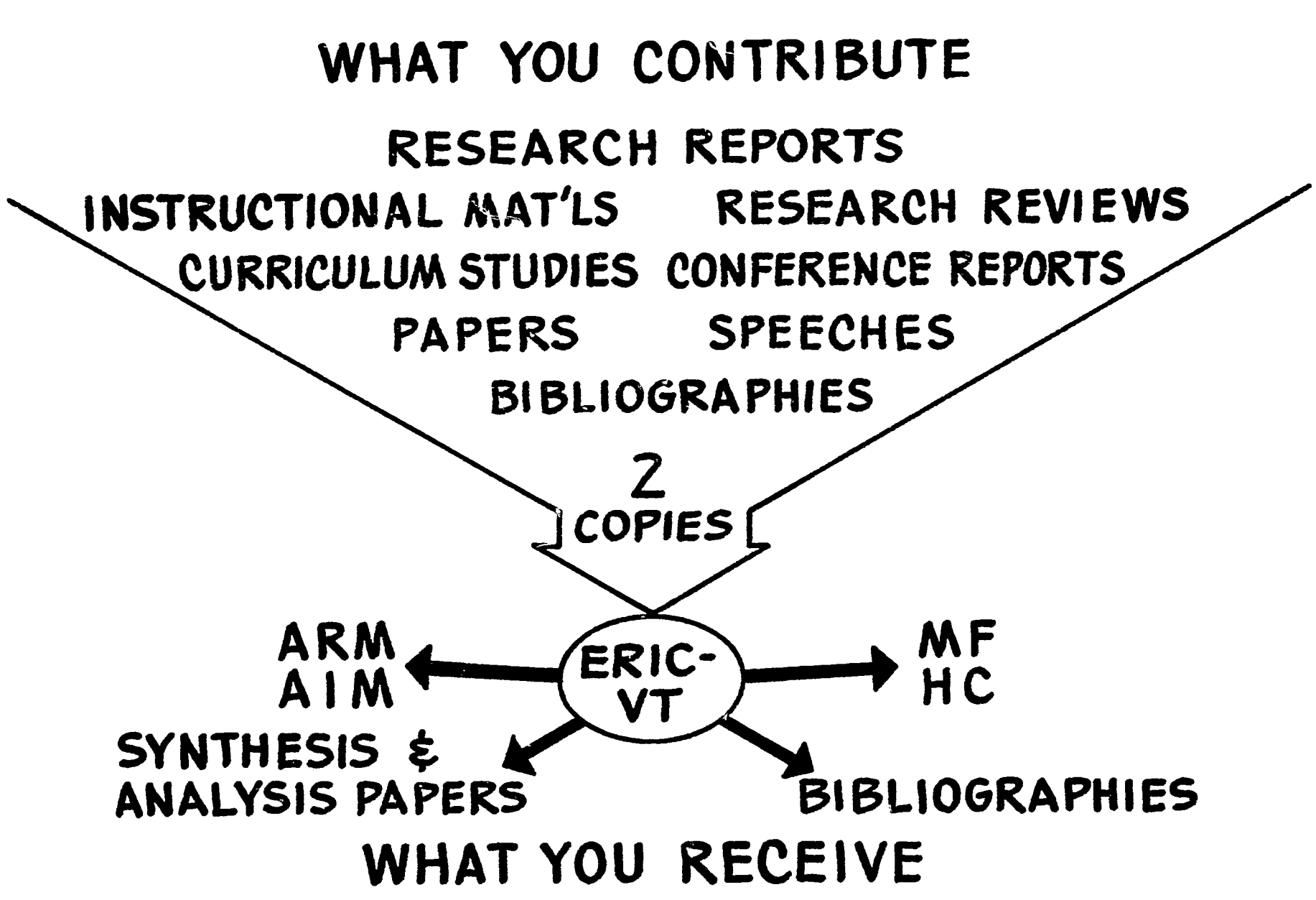


ILLUSTRATION 12

ERIC Clearinghouse
The Center for Vocational & Technical Education
The Ohio State University
980 Kinnear Road
Columbus, Ohio 43212

Attn:

Director
Coordinator
Indexing-Abstracting Editor
Acquisition Specialist
Retrieval Specialist

PART 7

VOCATIONAL AND TECHNICAL EDUCATION FACILITIES LAYOUTS

VOCATIONAL AND TECHNICAL EDUCATION FACILITIES LAYOUTS

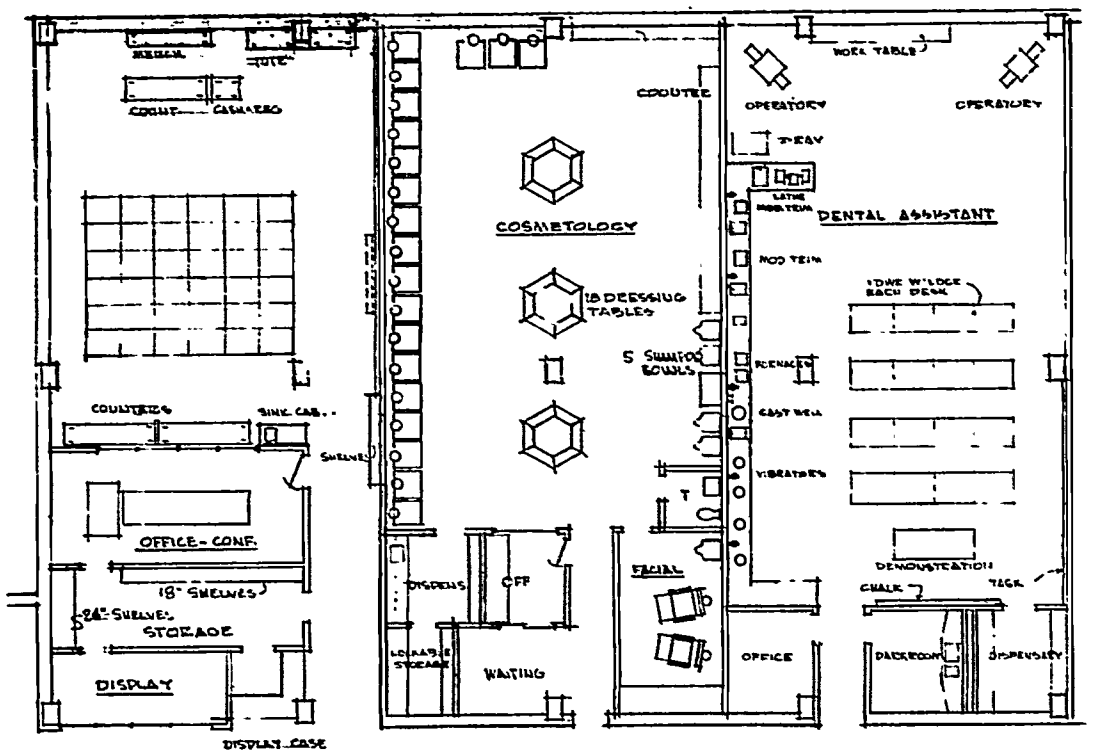
Facilities Planning and Development Section, Division of Vocational and Technical Education, U. S. Office of Education and Project Staff

This section of the publication consists of a series of vocational and technical education facilities layouts which have been selected to show the diversity of facility designs being implemented throughout the nation. The need for such a compilation was expressed by technical education leaders at the National Program Development Institutes' Evaluation Conference.

No attempt has been made to discuss the relative merits of each facility included. As part of the title block, the layouts include a brief descriptive comment to identify design features.

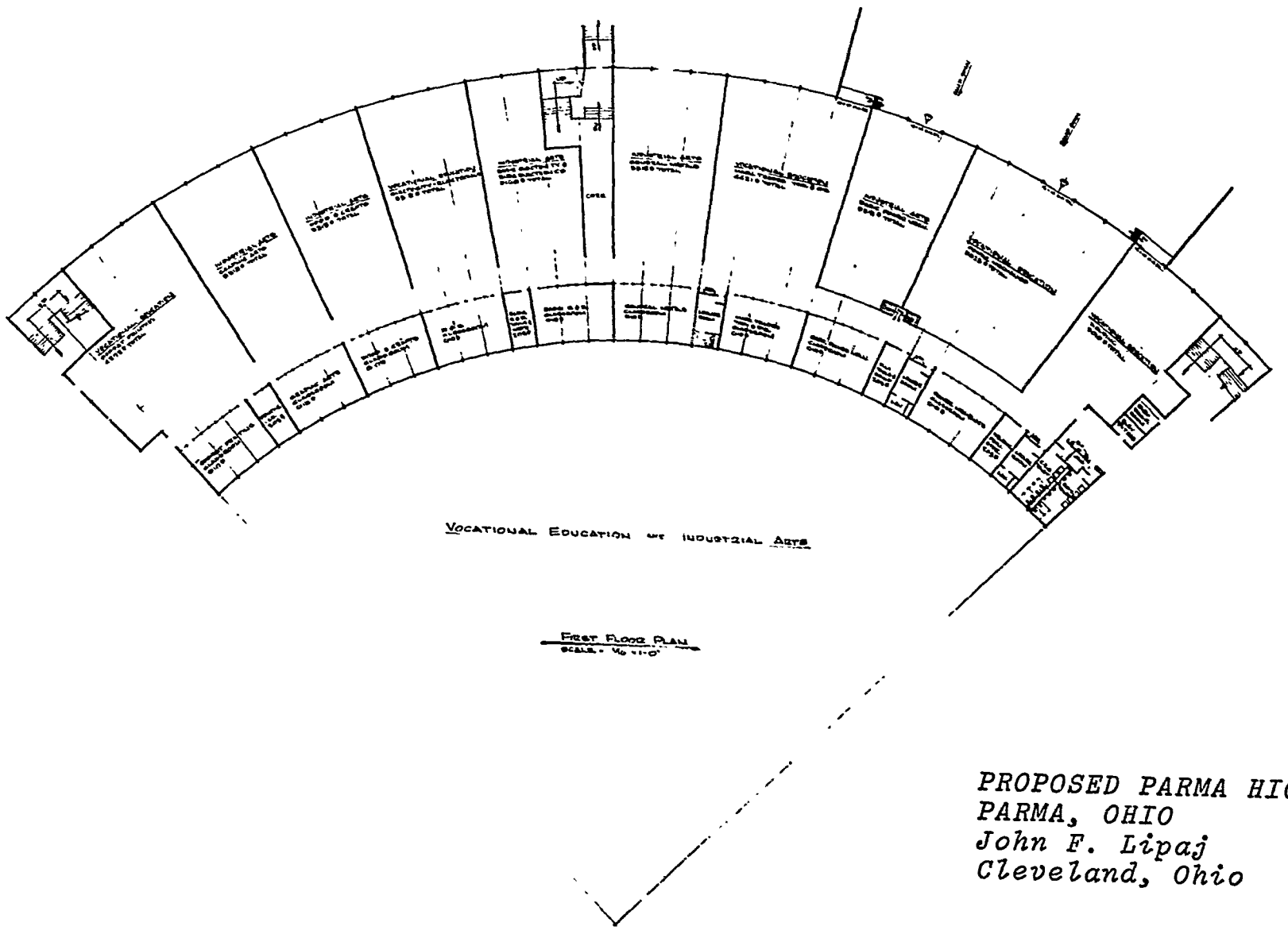
This compilation is not meant to be representative of all the different types of vocational and technical education facilities in existence. It does, however, provide the reader with an idea of the diverse kinds of facilities being planned and built across the country.

CLUSTER DESIGN



MIDDLETOWN EAST HIGH SCHOOL
MIDDLETOWN, OHIO
Thomas J. McClorey & Associates
Cincinnati, Ohio

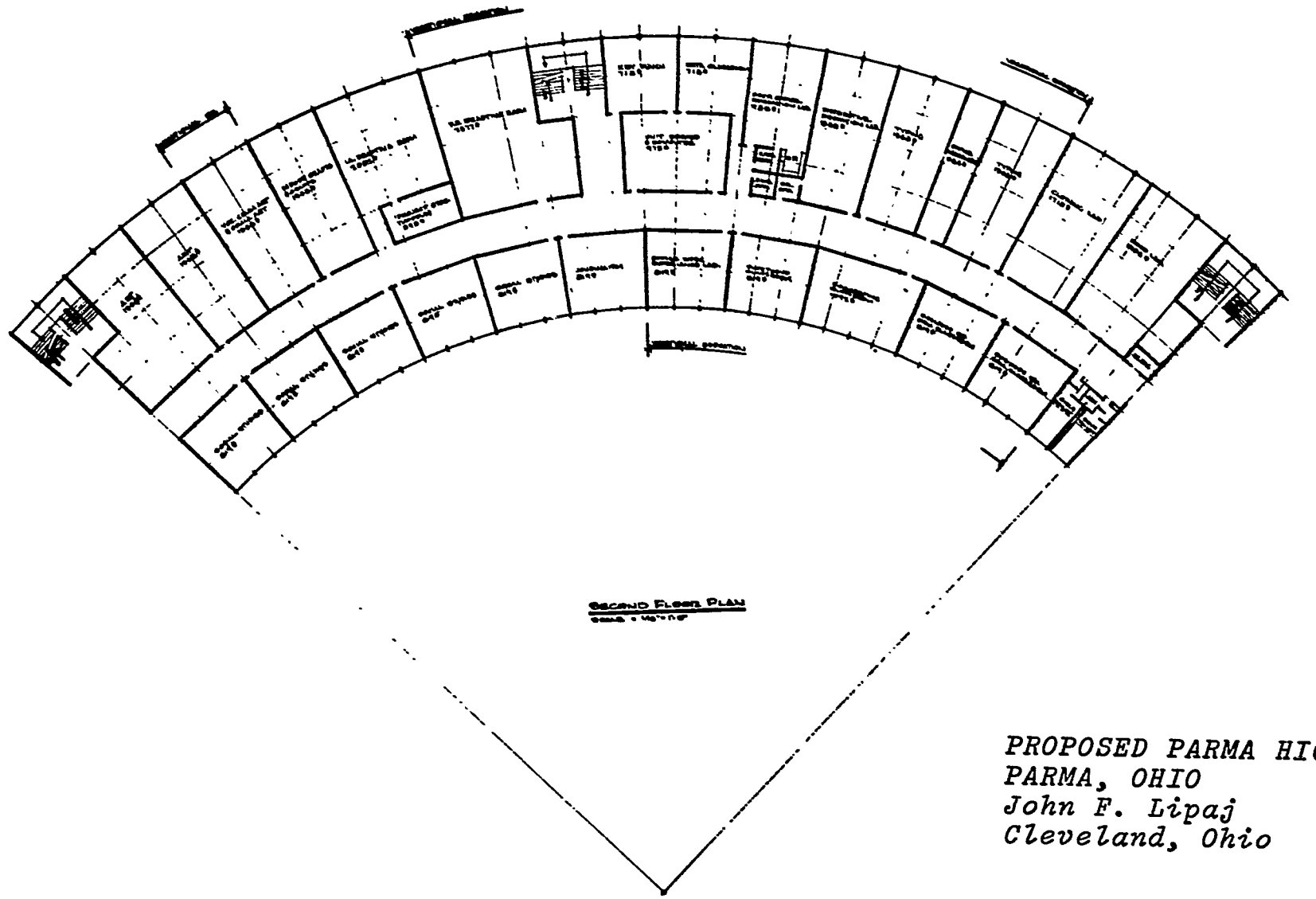
MULTI-STORY CIRCULAR DESIGN (A)



FIRST FLOOR PLAN
SCALE: 1/8" = 1'-0"

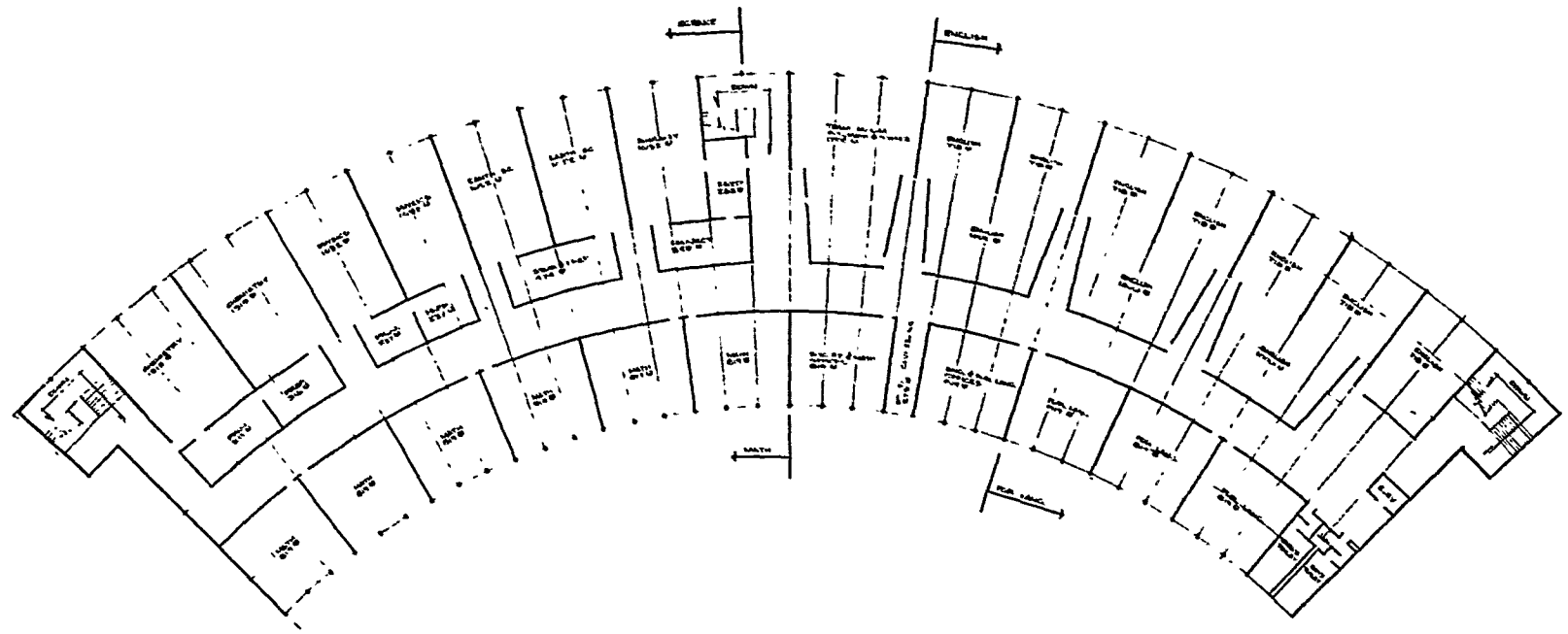
PROPOSED PARMA HIGH SCHOOL
PARMA, OHIO
John F. Lipaj
Cleveland, Ohio

MULTI-STORY CIRCULAR DESIGN (B)



PROPOSED PARMA HIGH SCHOOL
PARMA, OHIO
John F. Lipaj
Cleveland, Ohio

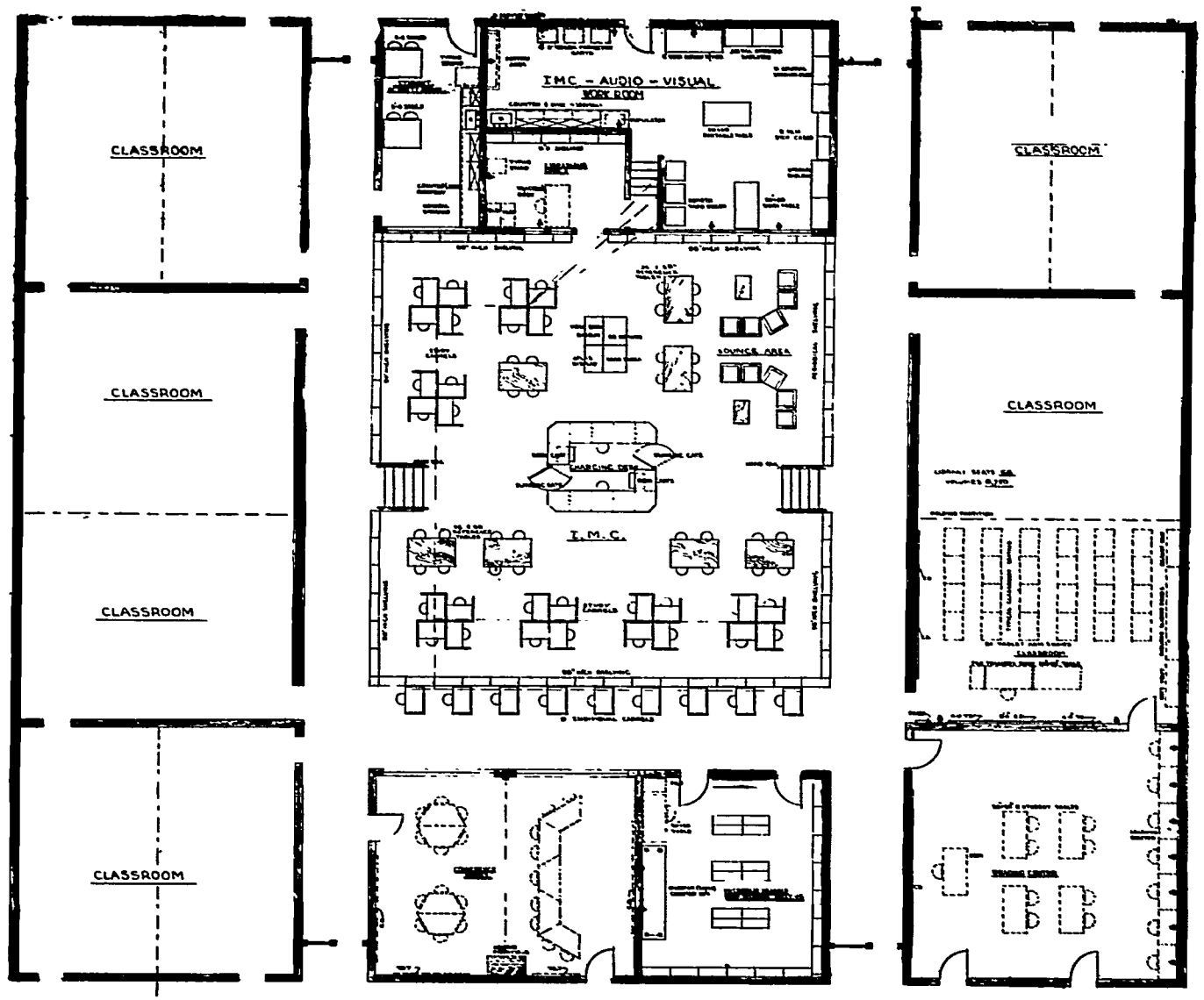
MULTI-STORY CIRCULAR DESIGN (C)



THIRD FLOOR PLAN

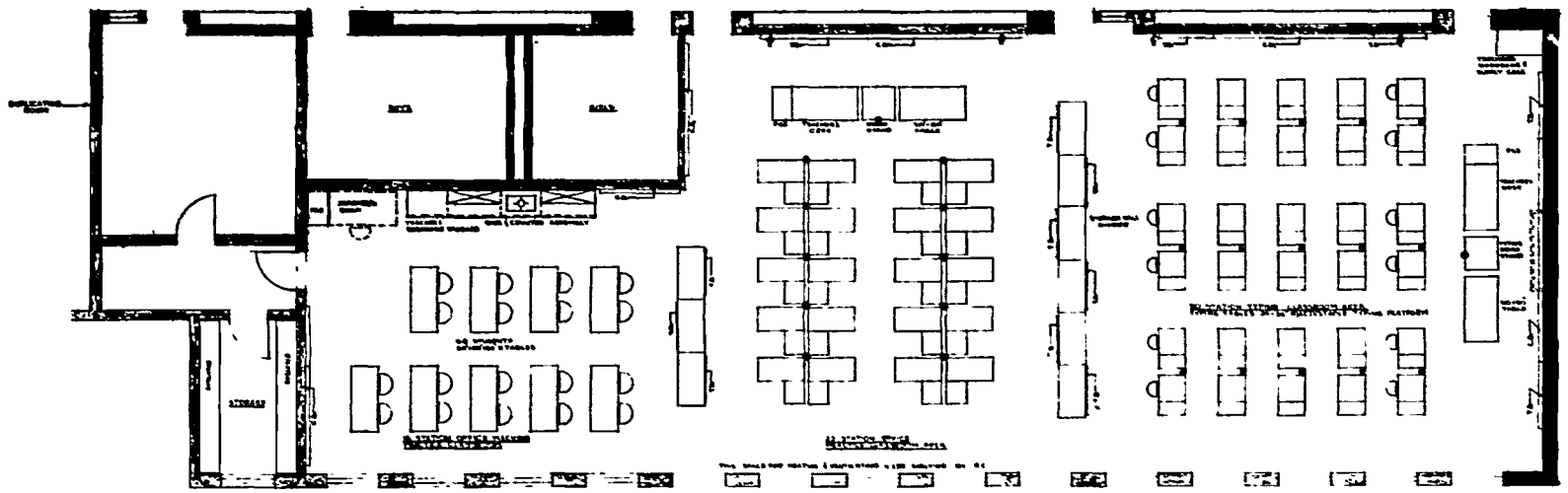
PROPOSED PARMA HIGH SCHOOL
PARMA, OHIO
John F. Lipaj
Cleveland, Ohio

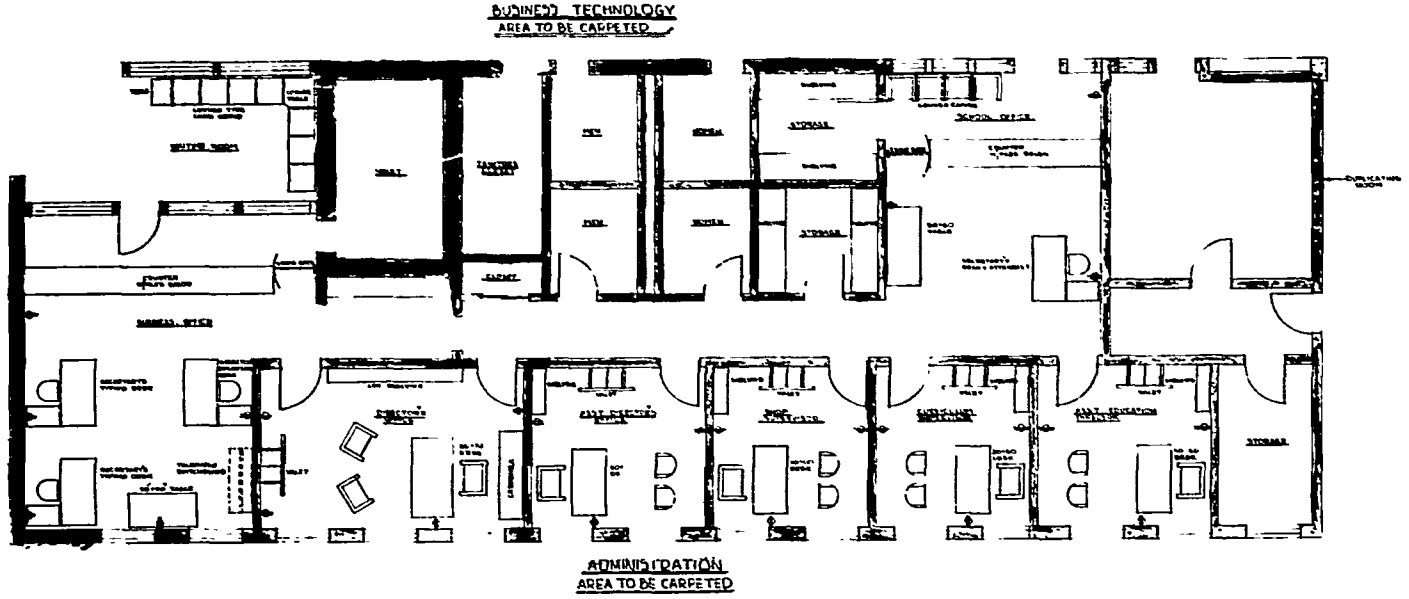
BUSINESS, OFFICE AND LIBRARY LAYOUT (A)



SHAWSHEEN VALLEY REGIONAL
VOC-TECH. HIGH SCHOOL
BURLINGTON, MASSACHUSETTS
Crabtree, Dawson & Michaels
Waltham, Massachusetts

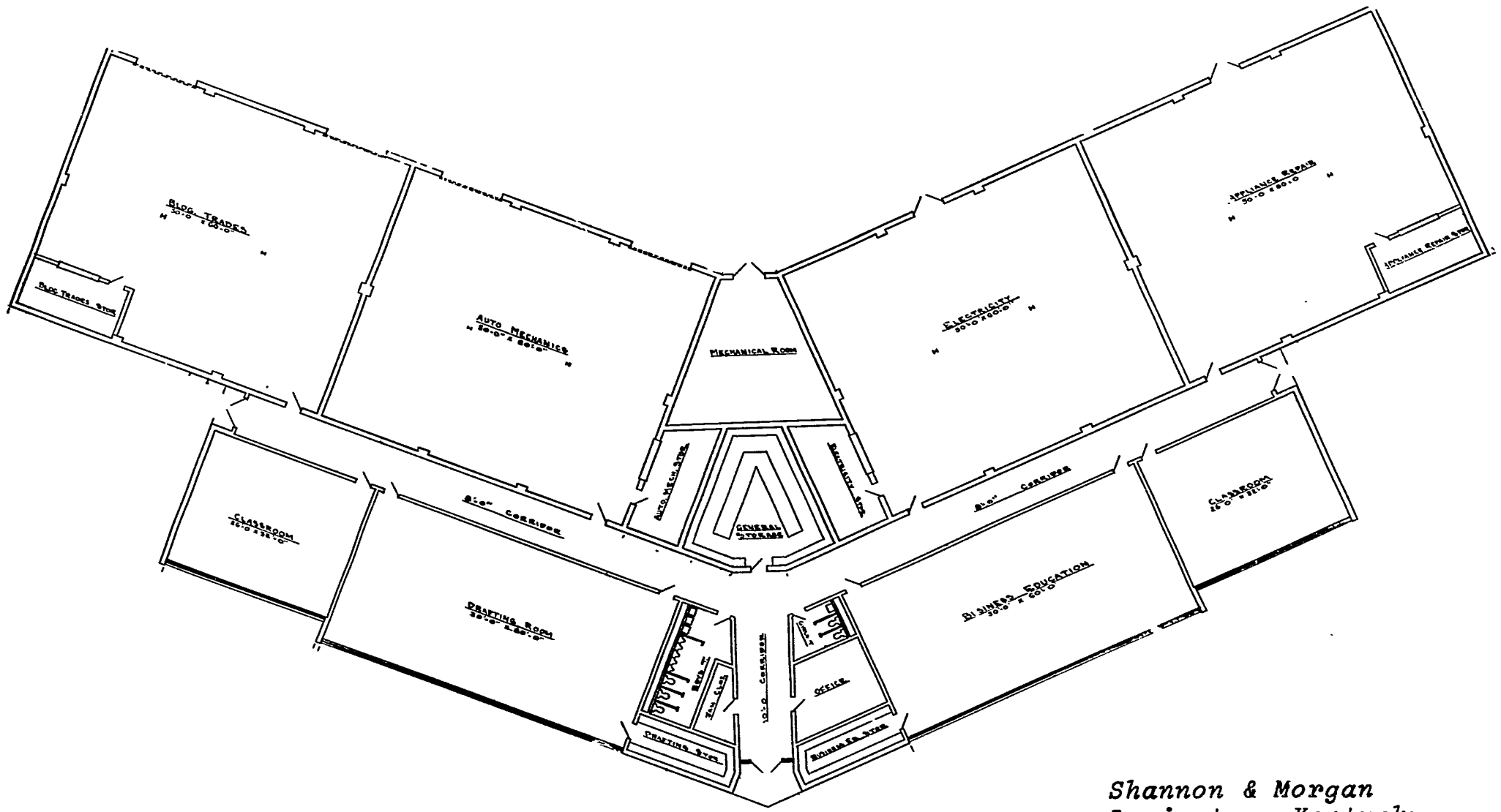
BUSINESS, OFFICE AND LIBRARY (B)





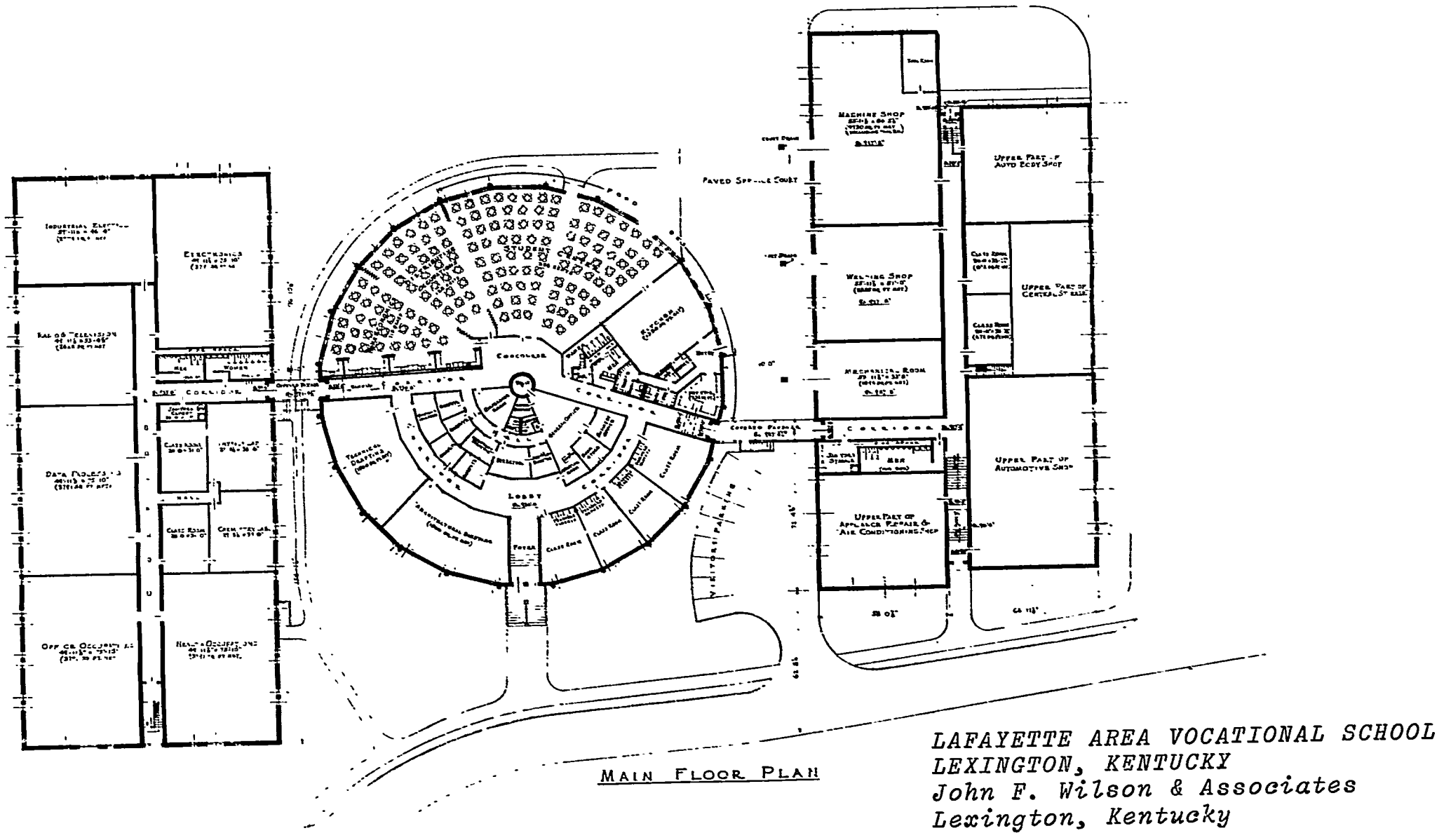
SHAWSHEEN VALLEY REGIONAL VOC-TECH. HIGH SCHOOL
Crabtree, Dawson & Michaels
Waltham, Massachusetts

A VOCATIONAL BUILDING-"THE START"



Shannon & Morgan
Lexington, Kentucky

CLUSTER FACILITIES



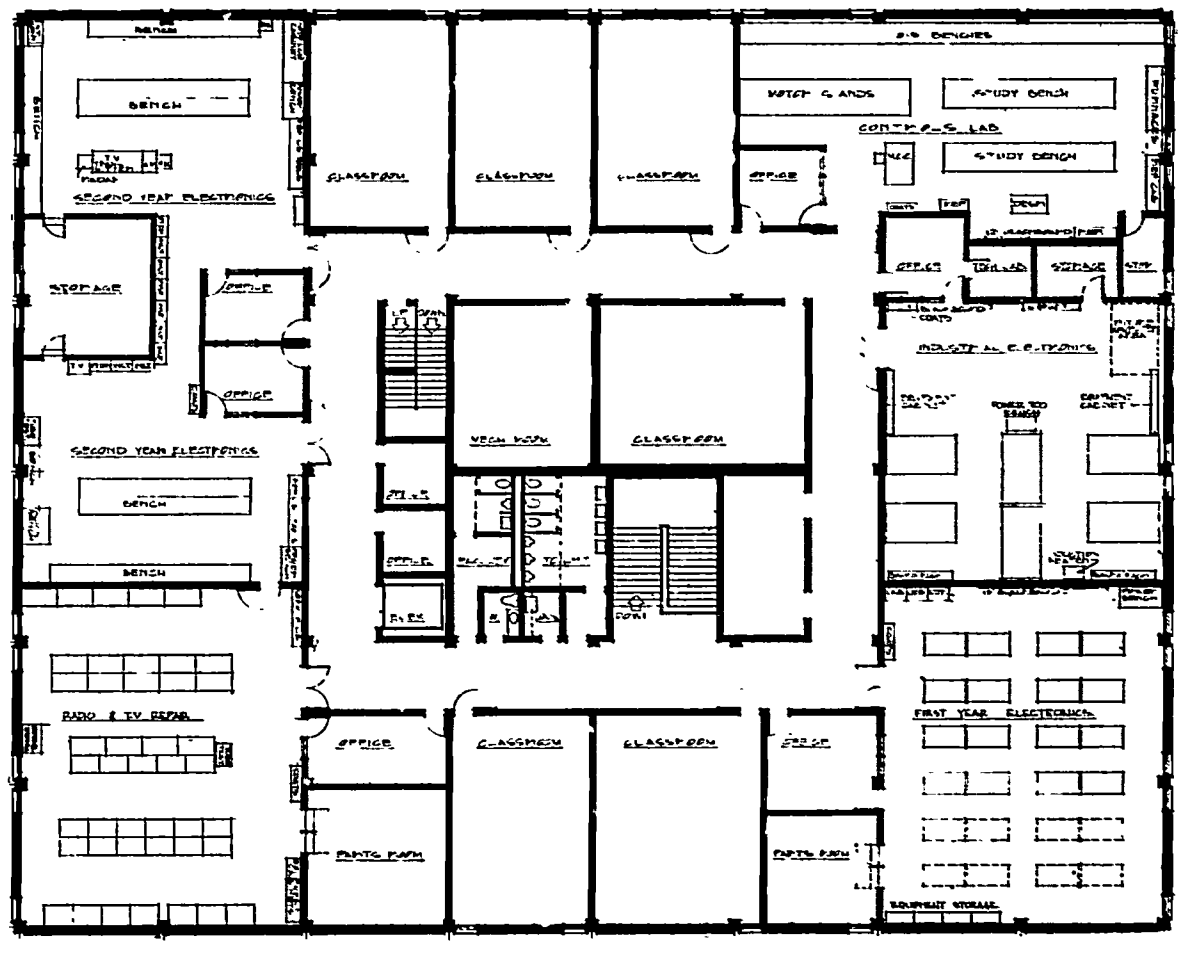
MAIN FLOOR PLAN

LAFAYETTE AREA VOCATIONAL SCHOOL
LEXINGTON, KENTUCKY
John F. Wilson & Associates
Lexington, Kentucky

CORE UNIT DESIGN (A)

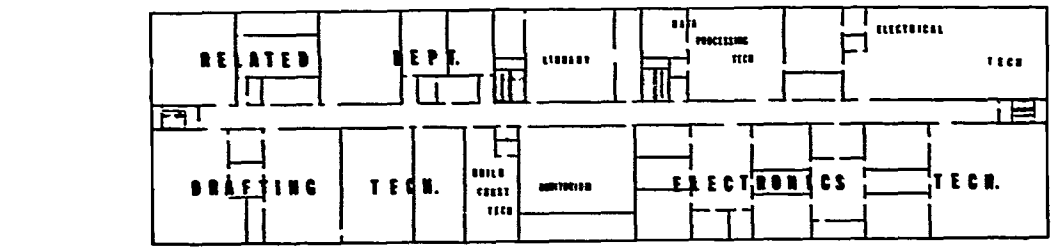
WAHPETON STATE SCHOOL OF SCIENCE
WAHPETON, NORTH DAKOTA
Johnson & Lightowler
Fargo, North Dakota

CORE UNIT DESIGN (B)

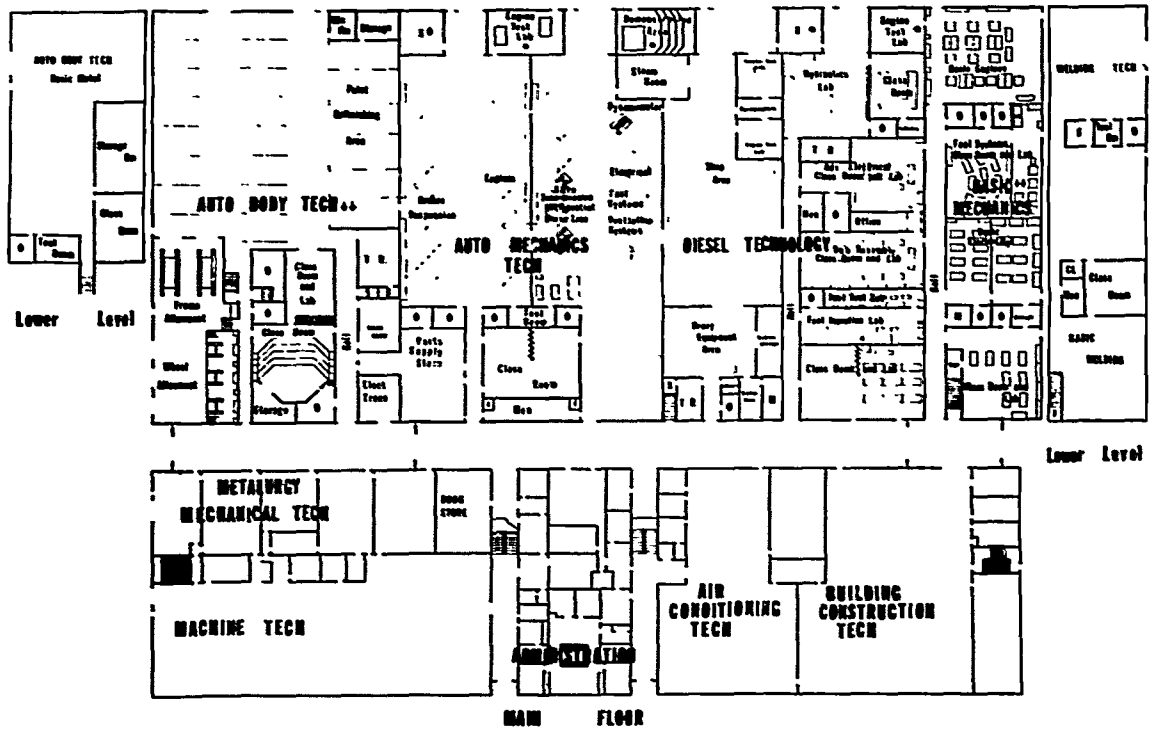


WAHPETON STATE SCHOOL OF SCIENCE
WAHPETON, NORTH DAKOTA
Johnson & Lightowler
Fargo, North Dakota

MULTI-STORY VOCATIONAL FACILITY

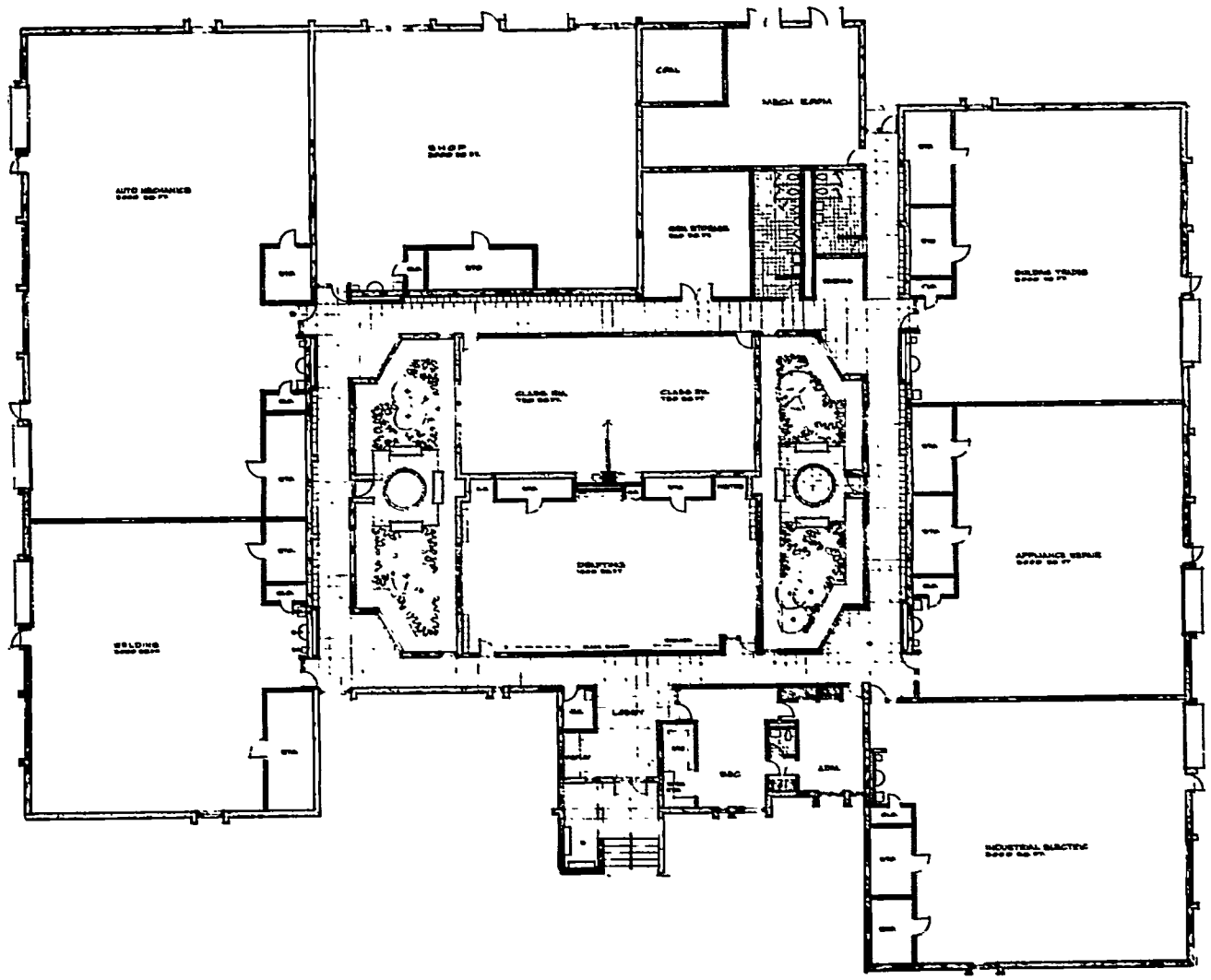


UPPER LEVEL



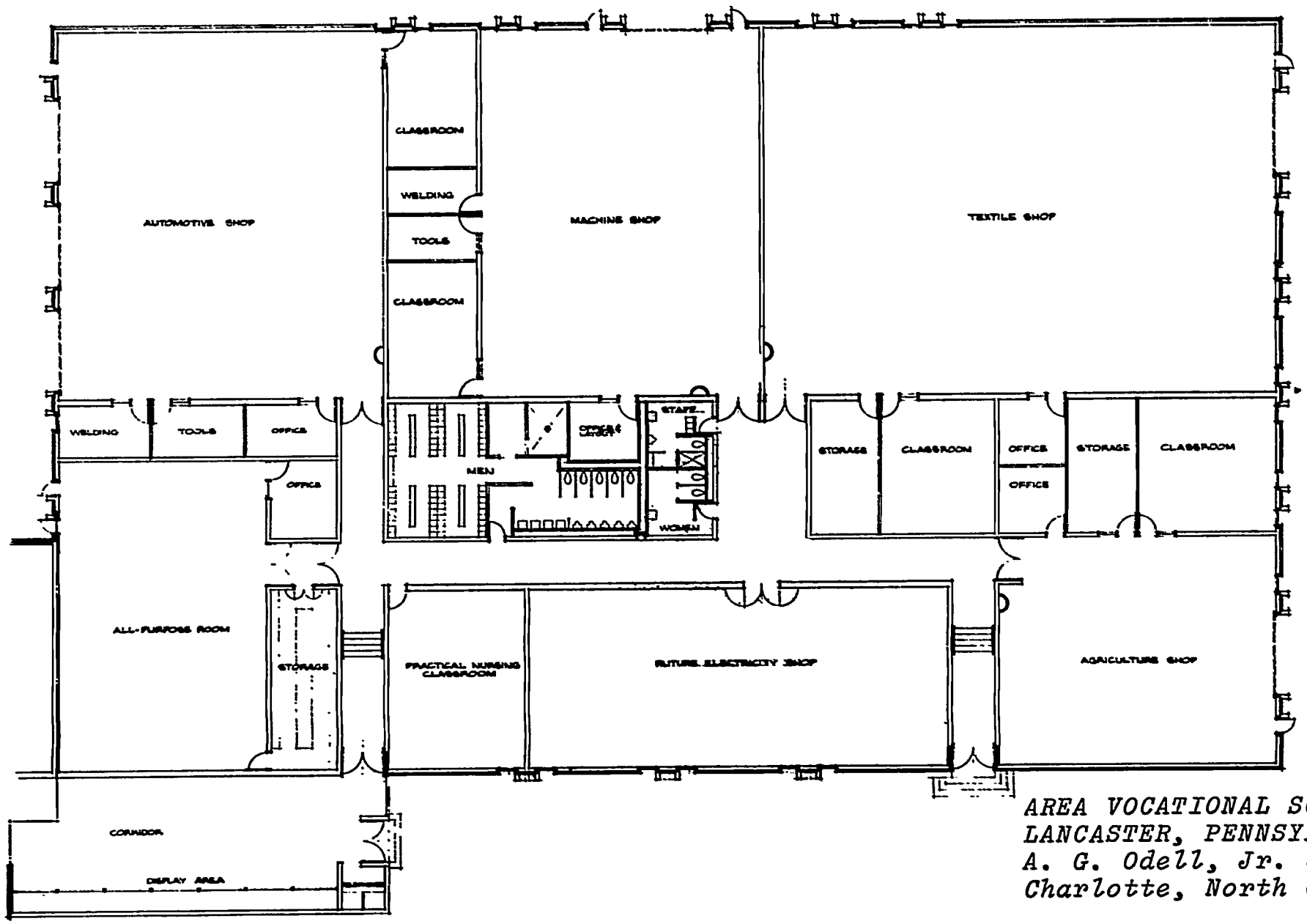
NEBRASKA VOCATIONAL TECHNICAL SCHOOL
MILFORD, NEBRASKA

PERIMETER SHOPS WITH CLASSROOM CORE



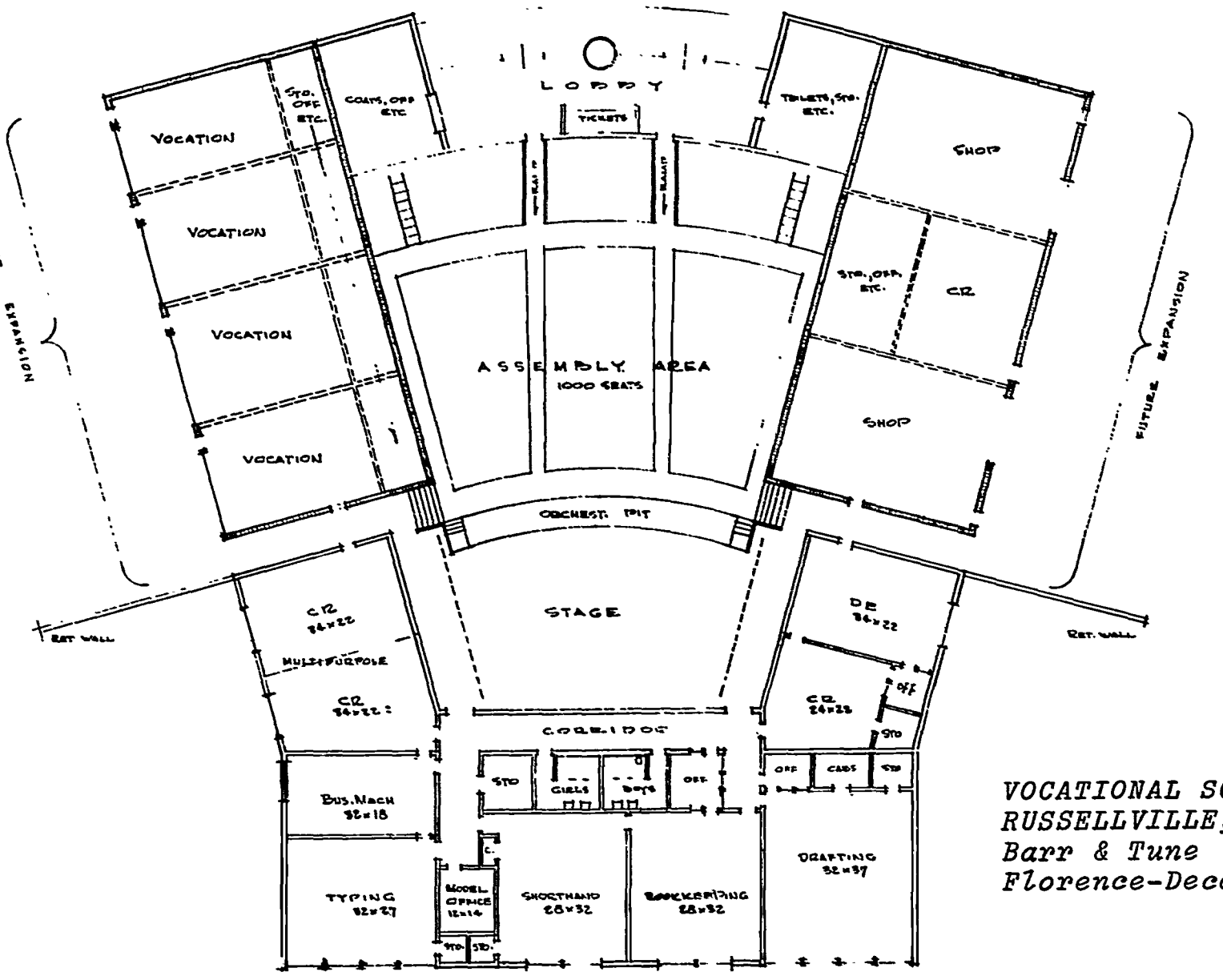
CLAY COUNTY VOCATIONAL SCHOOL
MANCHESTER, KENTUCKY
Bayless, Clotfelter & Johnson
Lexington, Kentucky

TYPICAL SHOP AND CLASSROOM LAYOUT



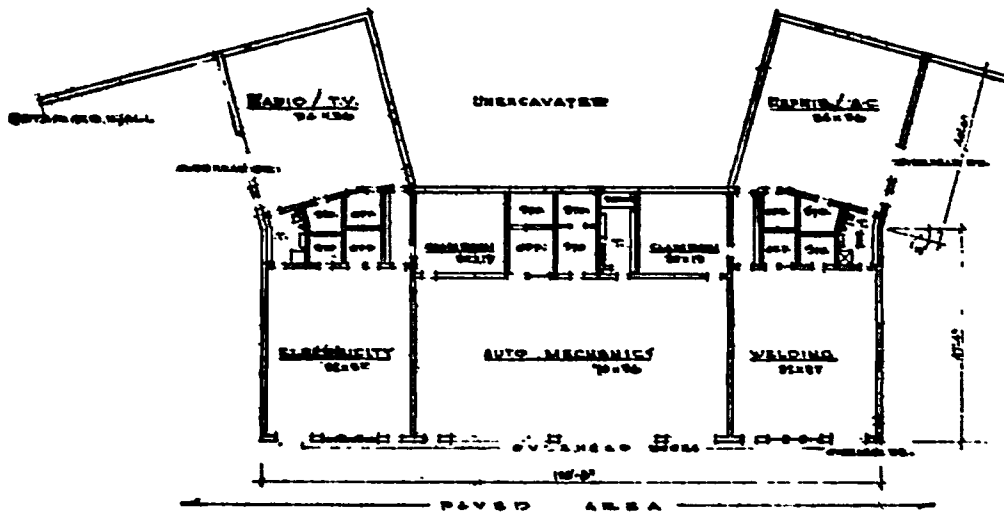
AREA VOCATIONAL SCHOOL
LANCASTER, PENNSYLVANIA
A. G. Odell, Jr. & Associates
Charlotte, North Carolina

PLANNING FOR TODAY AND TOMORROW (A)

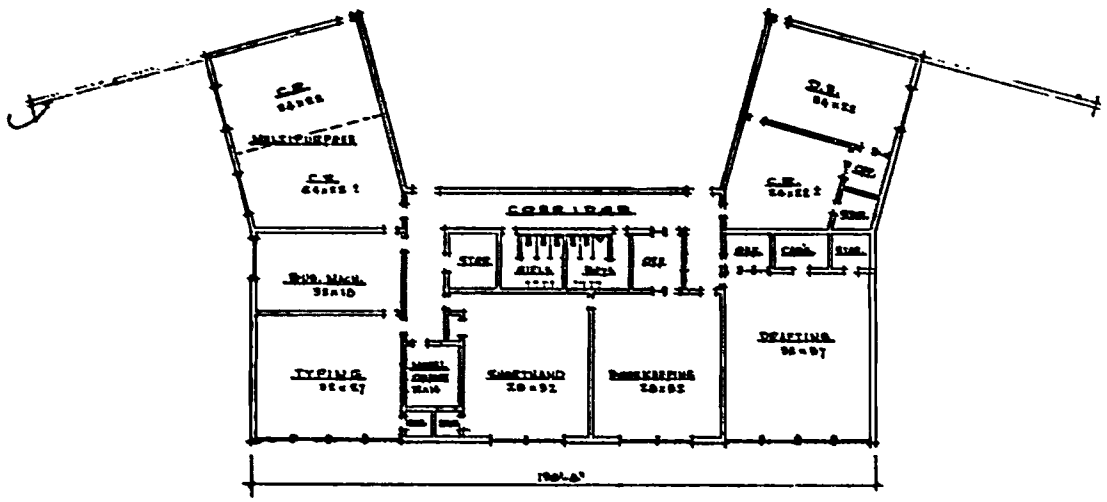


VOCATIONAL SCHOOL
RUSSELLVILLE, ALABAMA
Barr & Tune
Florence-Decatur, Alabama

PLANNING FOR TODAY AND TOMORROW (B)



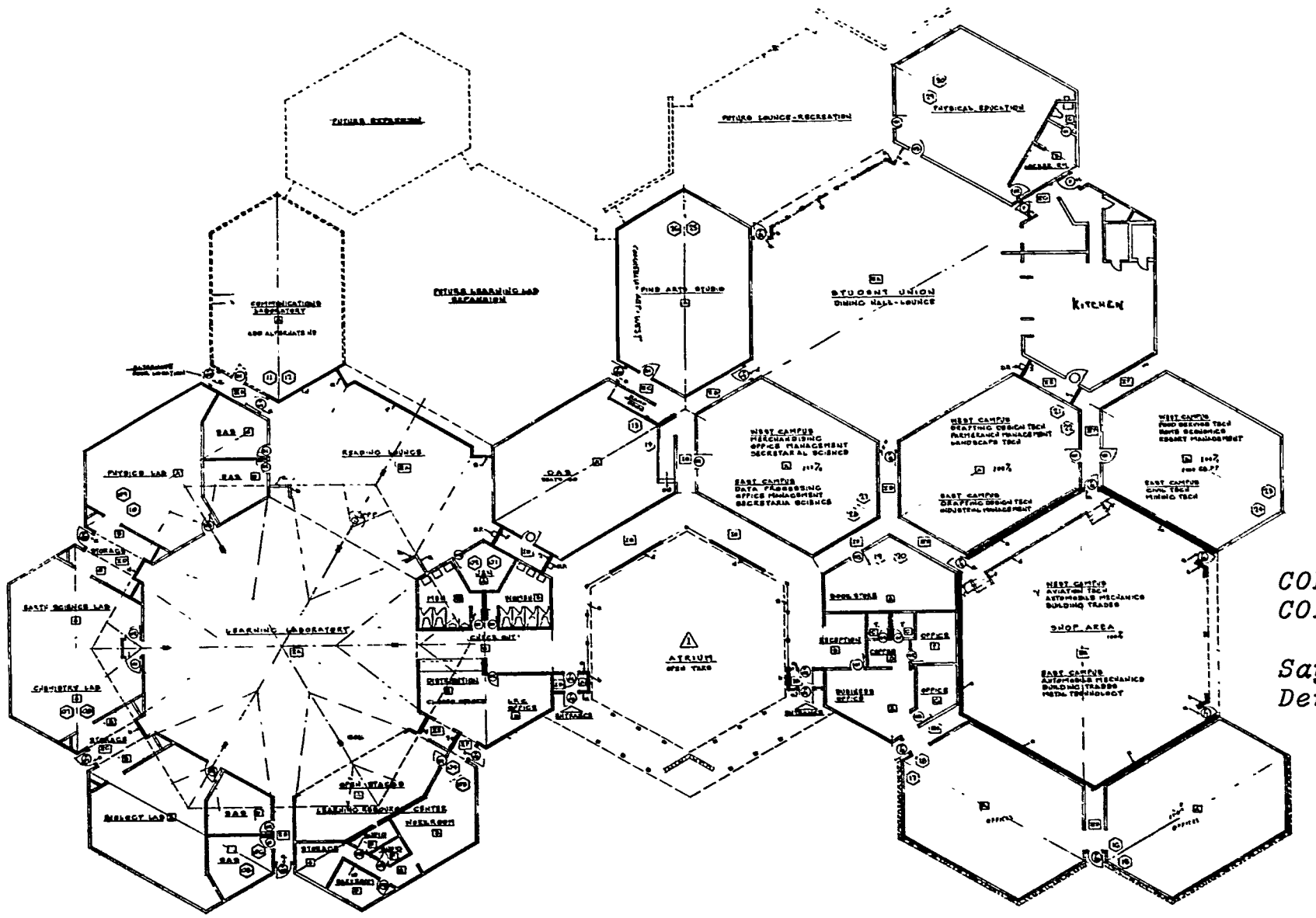
LOWER LEVEL - SHOPS



UPPER LEVEL VOCATIONAL CLASSROOMS

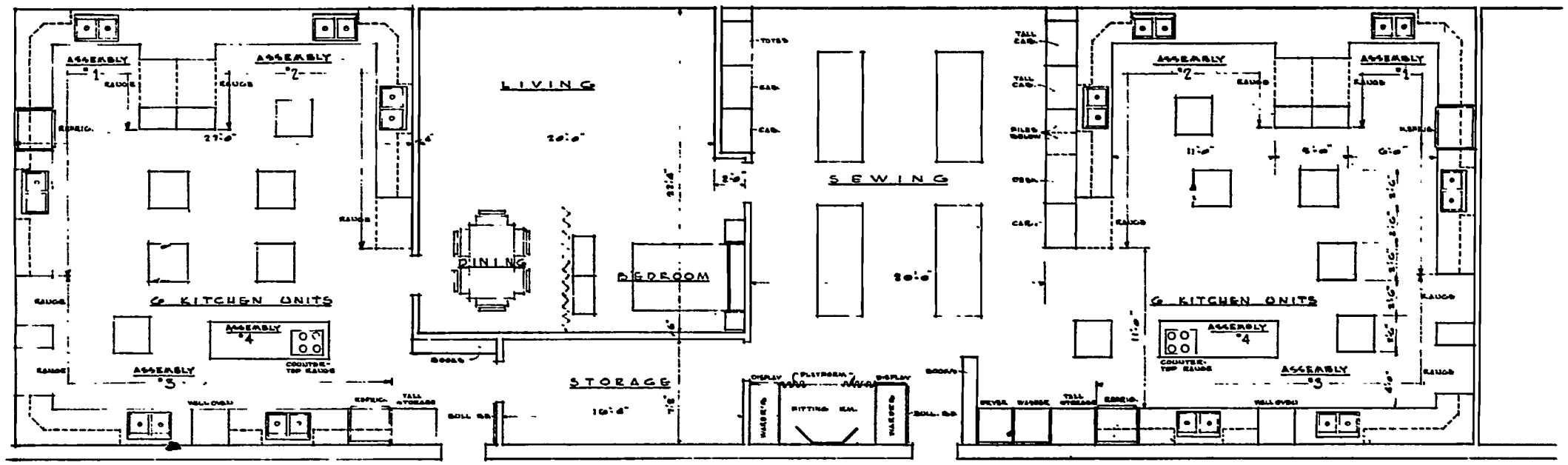
VOCATIONAL SCHOOL
RUSSELLVILLE, ALABAMA
Barr & Tune
Florence-Decatur, Alabama

CLUSTER FOR OCCUPATIONAL AND TECHNICAL EDUCATION WITHIN A COMMUNITY COLLEGE



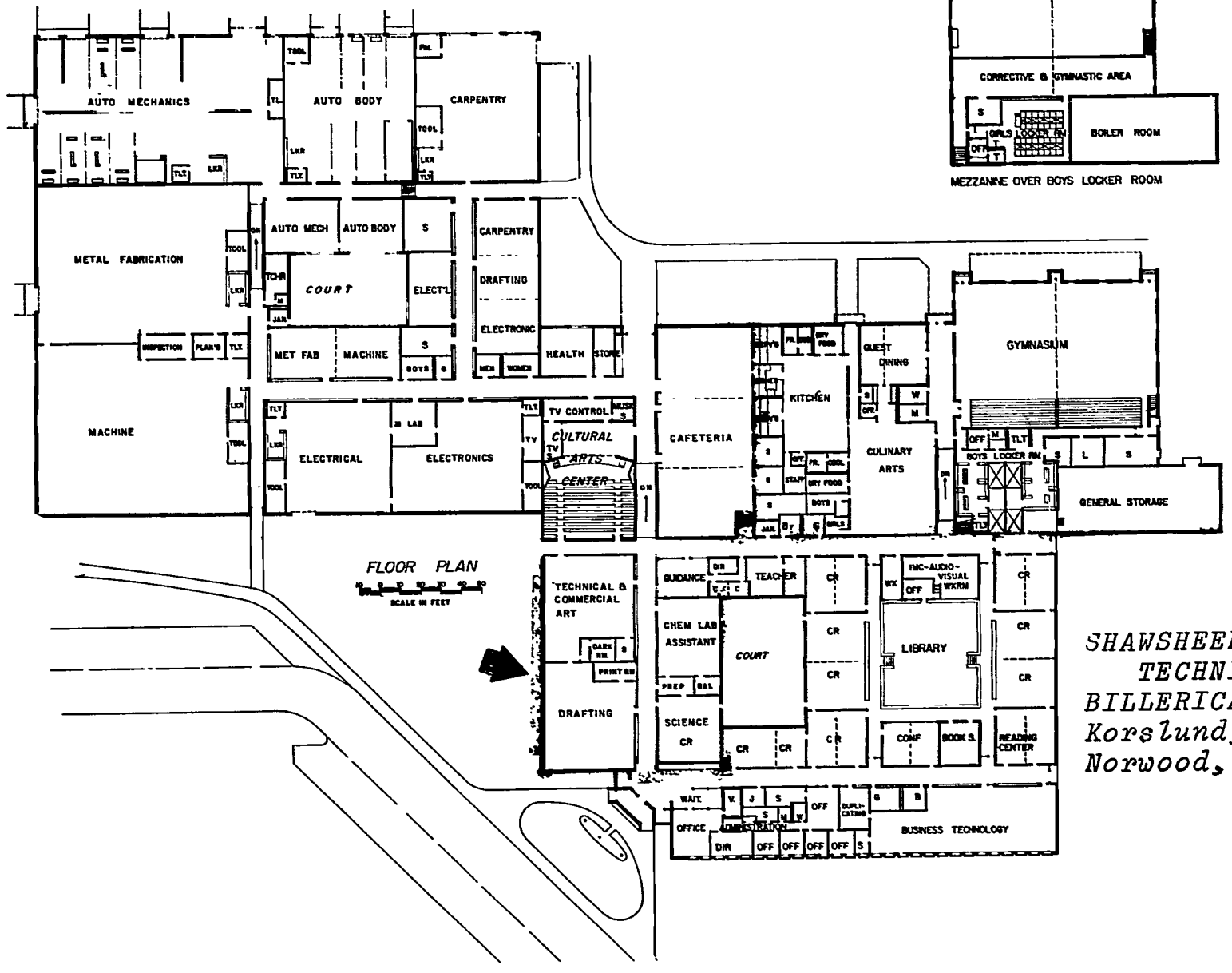
COLORADO MOUNTAIN COLLEGE
COLORADO MOUNTAIN JUNIOR COLLEGE DISTRICT
Sayre-Andresen
Denver, Colorado

HOME ECONOMICS CLUSTER



MIDDLETOWN EAST HIGH SCHOOL
MIDDLETOWN, OHIO
Thomas J. McClorey & Associates
Cincinnati, Ohio

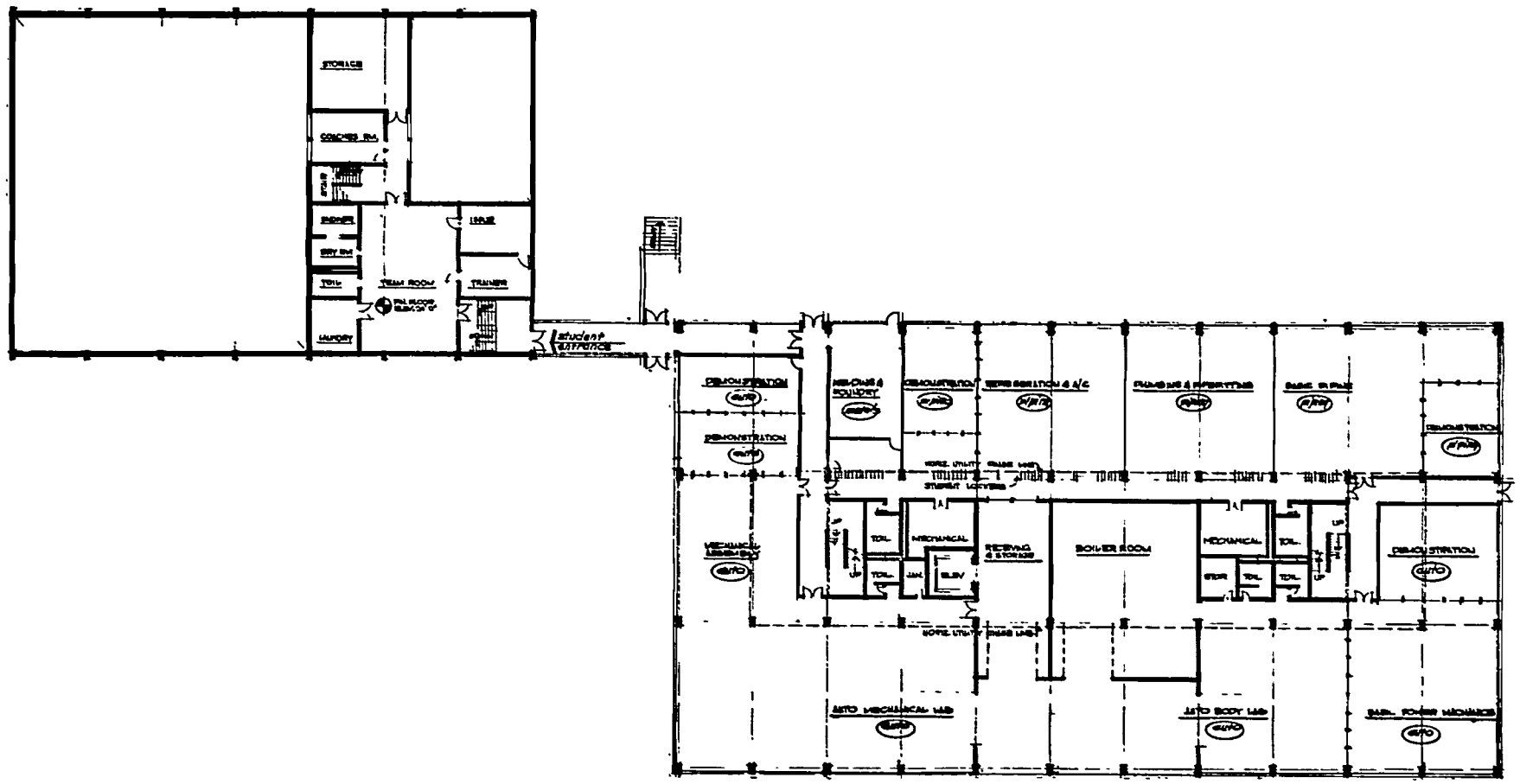
VOCATIONAL-TECHNICAL SCHOOL



MEZZANINE OVER BOYS LOCKER ROOM

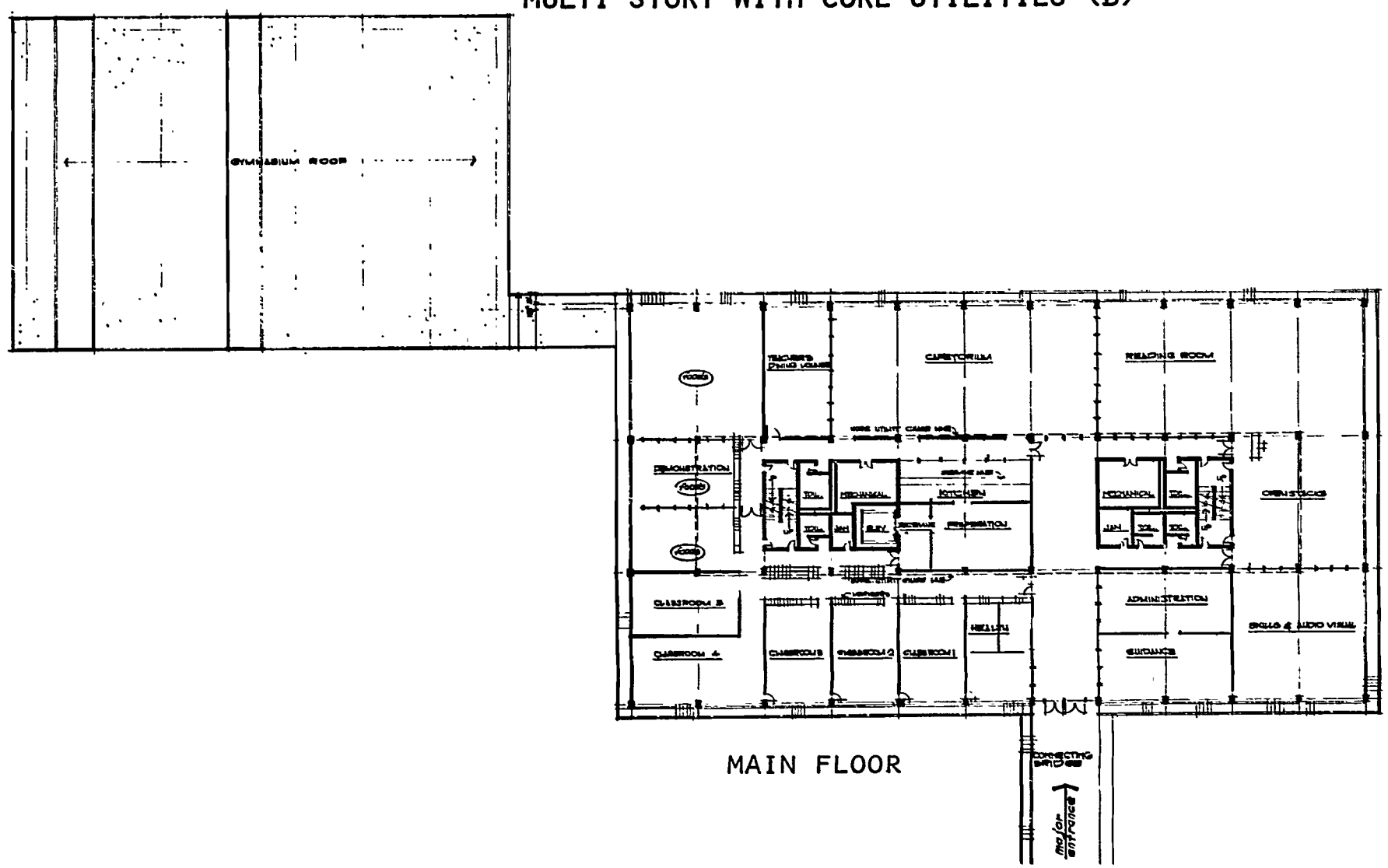
SHAWSHEEN REGIONAL VOCATIONAL-TECHNICAL SCHOOL DISTRICT
BILLERICA, MASSACHUSETTS
Korslund, LeNormand & Quann, Inc.
Norwood, Massachusetts

MULTI-STORY WITH CORE UTILITIES (A)



VOCATIONAL-TECHNICAL SCHOOL
QUINCY, MASSACHUSETTS
Kenneth F. Parry Associates, Inc.
Quincy, Massachusetts

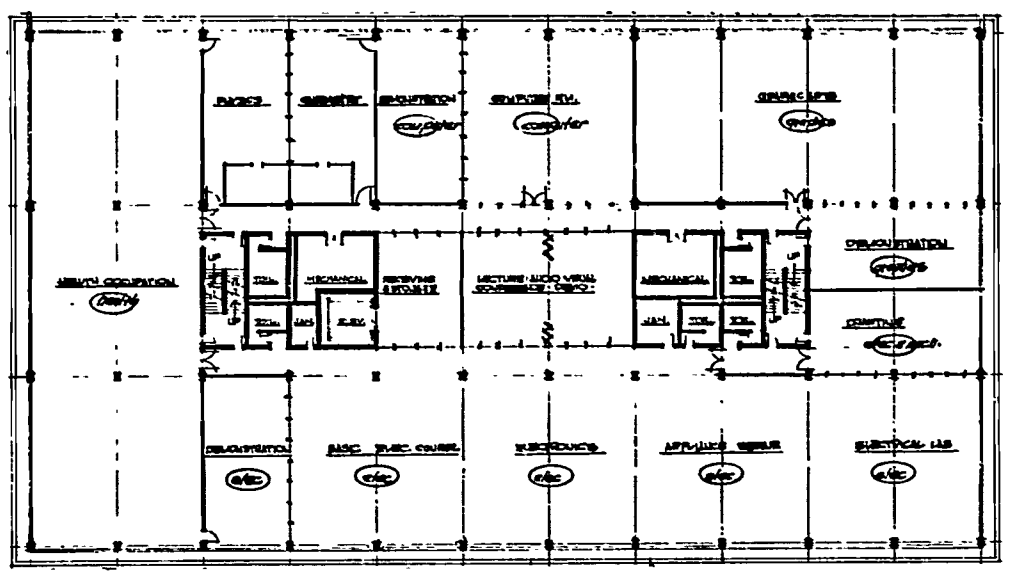
MULTI-STORY WITH CORE UTILITIES (B)



MAIN FLOOR

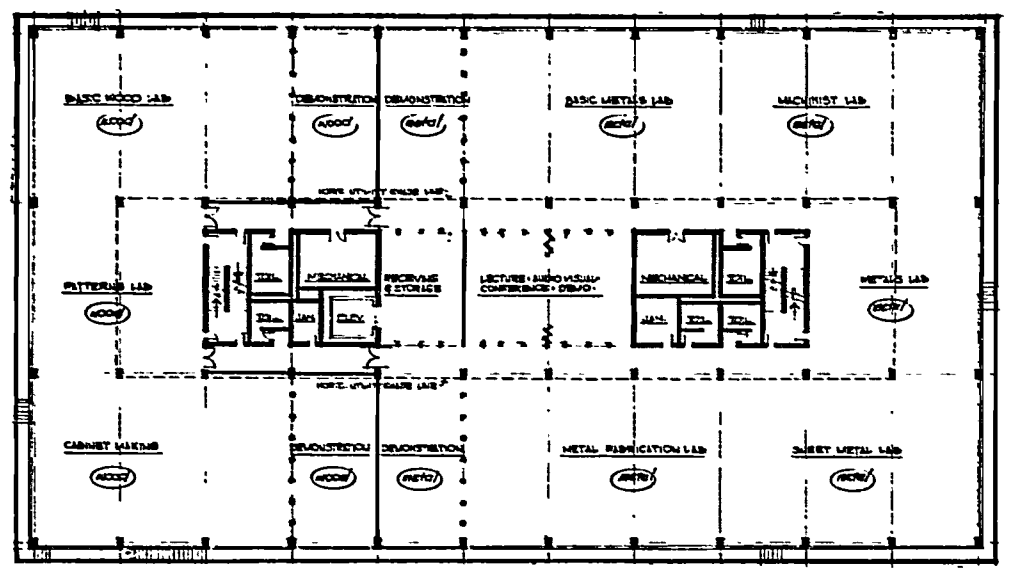
VOCATIONAL-TECHNICAL SCHOOL
QUINCY, MASSACHUSETTS
Kenneth F. Parry Associates, Inc.
Quincy, Massachusetts

MULTI-STORY WITH CORE UTILITIES (C)



SECOND FLOOR

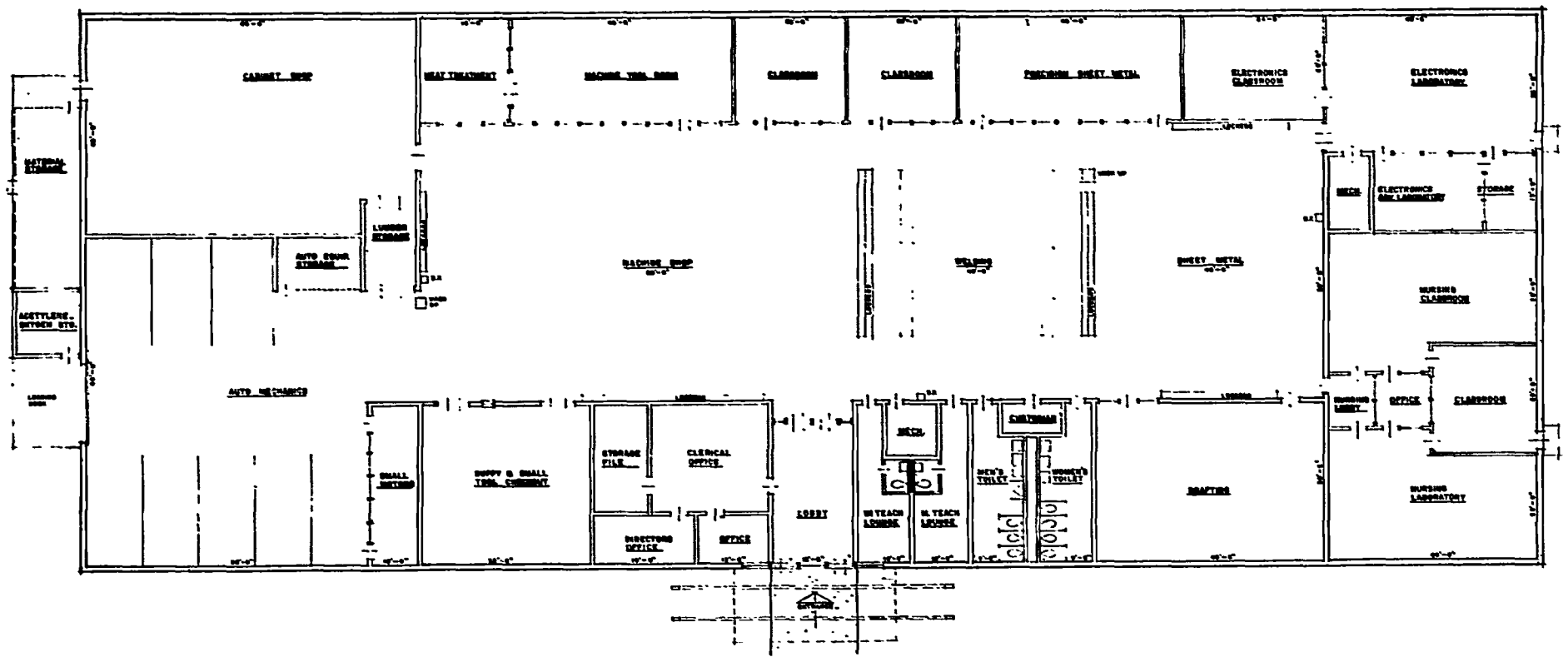
MULTI-STORY WITH CORE UTILITIES (D)



THIRD FLOOR

VOCATIONAL-TECHNICAL SCHOOL
QUINCY, MASSACHUSETTS
Kenneth F. Parry Associates, Inc.
Quincy, Massachusetts

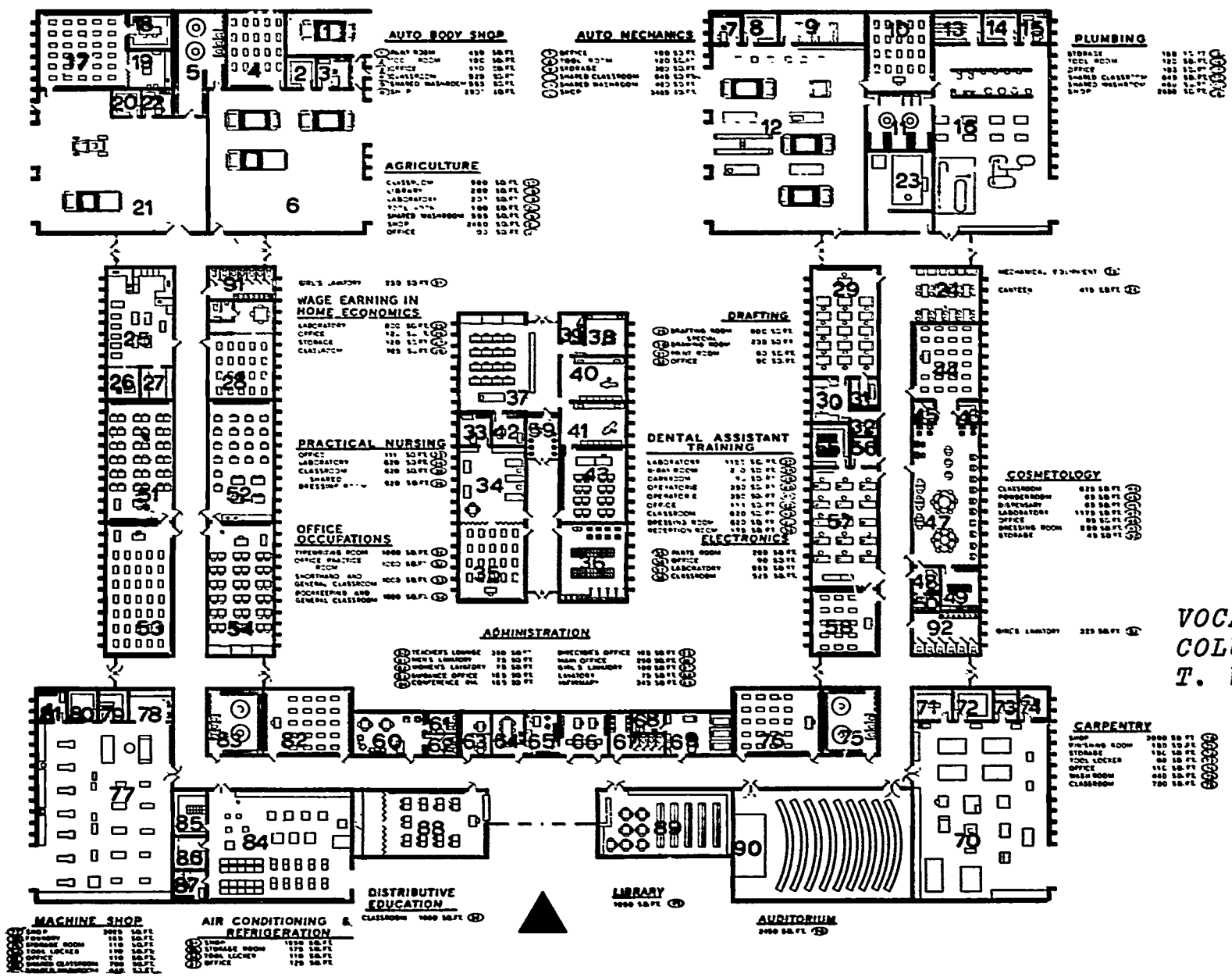
PLANNING WITHOUT HALLWAYS



FLOOR PLAN

FRANKLIN TECHNICAL SCHOOL
JOPLIN, MISSOURI SCHOOL DISTRICT
Allgeier, Martin & Associates
Joplin, Missouri

U-CLUSTER



VOCATIONAL EDUCATION CENTER
COLUMBIA, SOUTH CAROLINA
T. W. Salmons

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