VOCATIONAL-TECHNICAL EDUCATION FOR THE SPACE AGE

A Master Plan for Maine

Prepared for

THE STATE DEPARTMENT OF EDUCATION

by

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FOREWORD

At the invitation of the Maine State Department of Education, W. R. and Marie A. Flesher met on April 9, 1962 with Dr. Warren G. Hill, Commissioner of Education, and three of his central staff for the purpose of discussing certain educational needs in Maine and the possibility of assistance from SCHOOL SURVEY SERVICE. The Fleshers submitted a survey proposal on April 16, which was approved on April 27 by the Maine State Board of Education.

Field work was done by the Survey Staff in May and August. Questionnaires were distributed in May and June while schools were still in session. Reports and records were analyzed during the survey period.

The Survey Staff was given able assistance by many individuals and groups in Maine. The Survey Staff is especially indebted to John A. Snell, Chief of the Bureau of Vocational Education and other members of the State Department of Education for their assistance. Earl Hutchinson and Keith Thompson, principals, respectively, at Maine Vocational-Technical Institute and Northeastern Maine Vocational Institute were courteous and helpful hosts when their institutions were visited by the Survey Staff.

The cooperation of school superintendents, high school principals and counselors, throughout the State, and the faculty, students, and alumni of MVTI in completing and returning survey questionnaires is hereby acknowledged with appreciation.

It is the hope of the four members of the Survey Staff that the report herewith presented will be a helpful guide in improving vocational-technical education in Maine for many years to come.

Columbus, Ohio
October 10, 1962

W. R. Flesher
Marie A. Flesher

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SECTION 1

THE SETTING FOR THE SURVEY

The primary purpose of this section of the report of the survey of vocational-technical education in Maine is to provide background for the three sections which follow. Included among the topics to be presented briefly are the procedures used in the survey, some data about the distribution of Maine's labor force and related topics, a description of what constitutes a quality program of trade and industrial education, and a discussion of the question of accrediation and the possible granting of Associate degrees by post-high school vocational-technical institutes.

Evidence of the interest of Maine educational and governmental leaders in vocational-technical education is indicated by the survey which they made in 1959, the current survey, the proposed legislation concerning the development of area vocational-technical schools, and the fact that one institution, Maine Vocational-Technical Institute, is already operating and that certain basic facilities have been acquired in Presque Isle for a second such institution.

Need for the Survey Reported Herein

Apparently the State authorities of Maine responsible for educational leadership profited a great deal from the survey which they made, with some outside assistance, in 1959.[1] In the meantime some of the issues they faced had become somewhat more acute, and they sought the assistance of SCHOOL SURVEY SERVICE of Columbus, Ohio. The State Department of Education was interested primarily in securing professional help with the problem of post-high school education in the trade, industrial, and technical occupations and its relationship, again primarily, to the high school programs of the State in trade and industrial education. Of somewhat peripheral concern to the State Department were the State's problems in the vocational field as they relate to vocational agriculture, vocational home economics, and distributive education.

That at least one other group in Maine has been concerned about some of these problems is reflected in the following statements from a report issued in 1960 by a committee of 70 lay persons. This committee said:

> The State of Maine faces a difficult problem in attempting to provide better vocational training for its young people. The Governor's Advisory Committee on Education realizes that the lack of an adequate vocational education program is one of the most serious of the state's educational shortcomings, and the committee is currently engaged in a study that will produce recommendations in this field. [Italics by SCHOOL SURVEY SERVICE][2]

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[1] State of Maine, Department of Education, "A Study of Needs for Vocational and Technical Training in Maine," 1959. 114 pp.

[2] Governor's Advisory Committee on Education, Report on School Financing, October, 1960. p. 5. (report is unpaged).

Far too many boys and girls are dropping out of school in Maine before completing high school. . . . Maine schools must strengthen their guidance departments, improve their vocational programs, and continue to assess their curriculums. [Italics by SCHOOL SURVEY SERVICE] [3]

The State of Maine has an obligation to strengthen the facilities and program at MVTI. It must also consider the possibility of establishing additional post high school vocational schools in other parts of the state, to provide vocational training opportunities for students in that area. [4]

All the evidence, then, indicates that sizable additional costs must be assumed by the municipalities and by the state government in order to provide the much higher quality of vocational education needed. The success of this program, and the speed with which it is brought into operation, will have a growing impact on the economy of Maine. [Italics by SCHOOL SURVEY SERVICE] [5]

In another report issued in 1960 - that of a state survey of vocational and technical education - are summarized very ably the results of many recent studies relative to the question of basic needs for education. That report says:

Basic needs for education are rooted in the increasing complexity of the American economy. The crucial changes bearing upon this problem have been listed in many recent studies:

1. All phases of the economy have felt the impact of revolutionary discoveries in science and technology.
2. In recent years there have been sharp decreases in unskilled jobs and increases in semi-skilled, skilled, and technical categories.
3. Many of the tradional jobs are disappearing, while complex machines and processes are creating new ones.
4. Technological developments are creating needs for trained manpower at a faster rate than the public and private institutions are supplying persons with adequate preparation.
5. Man's grasp of the methods of science and his disposition toward discovery indicate that no limits to continued change and development are in sight.
6. Changes in agriculture, business, and industry are creating new needs for the training of new workers as well as the retraining of those whose skills have become obsolescent.
7. The magnitude and complexity of the task for adequate training of sufficient numbers requires that states assume the responsibility for expanding and developing educational programs to meet the divergent needs of a technical society. [6]

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[3] Ibid., p. 4.

[4] Ibid., p. 6.

[5] Ibid., p. 6

[6] Bureau of Educational Research, College of Education, University of Illinois, Vocational and Technical Education in Illinois: Tomorrow's Challenge, 1960, p. 1.

A still more recent proposal regarding secondary education in Maine has raised some questions in the minds of vocational education leaders in Maine and has been of interest also to members of the Survey Staff as they have been engaged in their field work in Maine and have consulted with professional and lay persons in the State.[7] This 1962 publication fails in its entire length to mention trade and industrial education in connection with either the "proposed philosophy" or "program of studies" for Maine's secondary schools. It does refer to industrial arts, industrial crafts, practical arts, home economics, mechanical drawing, agriculture, and various elements of typical business education (commercial) programs. Since trade and industrial education at the high school level was one of the major foci of the survey herein being reported, the Survey Staff was surprised at the failure of the publication to make reference to the topic. The Survey Staff found many commendable points of view expressed in the report, however. Following are given some of these statements of interest to the study group as they considered the problems in Maine's program of vocational-technical education.

> ...Each school should offer educational programs geared to the aptitudes, abilities, interests, aims, and hence the needs of the pupils it serves.[8]

> Study each individual pupil to discover his traits, aptitudes, and abilities as a basis for guiding him into an appropriate program.[9]

> Provide exploratory experiences in practical arts courses and in work-experience programs to aid pupils in selecting more wisely their life's work. Except in business education, where it has been clearly established that specific job preparation is a function of the secondary school, the role of vocational education needs to be clarified by objective research.[10]

> Every educable youth in Maine has the right to expect his school to provide for him an educational program adjusted to his aptitudes, abilities, interests, aims, and needs. [Italics by SCHOOL SURVEY SERVICE][11]

Survey Procedures

The combined time spent by the four members of the Survey Staff in field work in Maine was approximately three months. At least two members of the survey group visited each of the 16 counties of the State and were in every shiretown. A sample of public high schools was visited, including all the school centers having trade and industrial education programs. Visits were made by all members of the Survey Staff to Maine Vocational-Technical Institute

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[7] State Curriculum Committee (Sponsored by the State Principals' Association, the Maine Association of Superintendents of Schools, and the State Department of Education), Proposed Philosophy and Program of Studies for Maine Secondary Schools (Revised), May, 1962. 24 pp.

[8] Ibid., p. 3.

[9] Ibid., p. 3.

[10] Ibid., p. 4.

[11] Ibid., p. 15.

(MVTI) at South Portland and Northeastern Maine Vocational Institute (NMVI) at Presque Isle. It should be pointed out, however, that the latter institution is not yet in operation as a school.

The Survey Staff drove a total of approximately 5, 300 miles in its visits around the State. A great variety of interviews were held with public school personnel (teachers and principals primarily), labor leaders, Chamber of Commerce personnel and other management persons, members of various divisions of State government, including, of course several members of the State Department of Education, and personnel at the State University and some of the State Colleges. Many reports of various kinds and certain records (at the State level and at MVTI) were secured and examined.

In addition to the above procedures, one important phase of the data-gathering process was the use of five different types of questionnaires. In Table 1. 1 are summarized information regarding the groups to whom these questionnaires were distributed, the number of persons contacted in each group, and the extent of cooperation in the completion and return of the questionnaires.

TABLE 1. 1

GROUPS CONTACTED BY SURVEY QUESTIONNAIRE AND THEIR PERCENTS OF RESPONSE

Group contacted	Questionnaires		Per cent of return
	Distributed	Returned	
School superintendents	130	90	69
High school counselors#	177	96	54
MVTI faculty	21	12	57
MVTI students*	121	89	74
MVTI alumni	283**	142	52

Source: Survey office records.

#The questionnaire to counselors was mailed to the high school principal, and he was asked to complete the questionnaire if his school had no counselor.

*Second-year students only.

**Seven of these were returned unopened because of inadequate addresses; the number received by alumni, therefore, was at least no greater than 276.

NOTE: MVTI is Maine Vocational-Technical Institute, located at South Portland.

All questionnaires completed and returned were mailed directly to the SCHOOL SURVEY SERVICE offices in Columbus, Ohio, where the tabulations were made. The results were then made available to the members of the Survey Staff as an important segment of the field data utilized in this state-wide survey.

In subsequent sections of this report is presented tabular material of a comparative nature for Maine and six other states selected by the Survey Staff for comparative purposes.

States were selected which were rather comparable to Maine in total population, area, and/or rural-urban distribution of population. In Table 1.2 are shown the population and area information for the seven states.

TABLE 1.2

POPULATION AND AREA DATA FOR
MAINE AND SIX STATES SELECTED FOR COMPARISON

State	Population (1960)	Area (sq. miles)
Arizona	1,302,161	113,810
Idaho	667,191	83,354
MAINE	969,265	29,895
New Mexico	951,023	122,503
Oregon	1,768,687	95,607
Utah	890,627	82,184
West Virginia	1,860,421	24,022

Source: United States Decennial Census, 1960.

West Virginia is the only one of the six states smaller in area than Maine, while Idaho, New Mexico, and Utah all have fewer persons than does Maine. Arizona and Oregon are included because of the rather close similarity of Arizona's population to that of Maine and the fact that Oregon, like Maine, has a single relatively large concentrated population (Portland in each state) and a large sparsely populated section of the state.

Certain Facts about Maine's Population

In Table 1.3 are presented the most recent data regarding the educational levels of the people in Maine and the number and per cent in each as of 1960. It can be noted that almost 30 per cent of the current population of Maine have the equivalent of high school graduation as their highest level of formal education; and that 13 per cent have attended college, with less than 5 per cent of the total population having gone to college four or more years. It is interesting to note that another 13 per cent did not finish grade 8. The reader should note, however, that the table includes Maine's population beginning with age 14. This means that large numbers have not yet had ample time to have graduated from high school to say nothing of college graduation or attendance.

A survey of vocational and technical education must involve a consideration of data related to the employment situation in the area under study. For this reason, Table 1.4 has been prepared to show the distribution of the employed workers of the State. One notes immediately that the largest group (almost one-half) are in the trade and industry category, which includes the industrial, technical, and service occupations. It can be noted also that there are sizable groups in the sales and distribution fields, a fact which has implications for programs in distributive education. The group directly related to agriculture is relatively small. There are, of course, occupations and businesses related to agriculture which utilize a background of preparation for or experience in strictly farming, or agricultural, pursuits. These include farm machinery sales and maintenance, food processing, fertilizer manufacture and distribution, etc.

TABLE 1.3

EDUCATIONAL STATUS OF MAINE POPULATION

14 YEARS OF AGE AND OVER

Years of school completed	Number	Per cent	Cumulative	Per cent
Public school:				
Less than 3 years	11,714	1.8	--	--
3 through 7 years	80,474	11.8	92,188	13.6
8 years	135,098	20.1	227,286	33.7
11 years	167,235	24.8	394,521	58.5
12 years	191,201	28.4	585,722	86.9
College:				
1 to 3 years	56,861	8.5	642,583	95.5
4 years	21,542	3.2	664,125	98.6
5 years	9,199	1.4	673,324	100.0
Total	673,324	100.0	--	--

Source: Table 103, U. S Census 1960 - Detailed Characteristics, Maine, - PC (1) 21D.

TABLE 1.4

MAINE EMPLOYMENT DISTRIBUTION IN 1960

Category	Number	Per cent
Professional (college required)	22,769	6.5
Farmers and Farm Managers	15,465	4.4
Managers and Proprietors (non-independent)	12,185	3.4
Clerical and Kindred Workers	37,921	10.7
Sales and Distribution	33,254	9.4
Trade and Industry (Industrial Technical and Service occupations	167,018	47.3
Other	64,375	18.3
Total	352,987	100.0

Source: Calculated from Table 120 - U. S. Census 1960 - Detailed Characteristics, Maine - PC (1) 21D.

As a further indication of the relative needs for different types of workers in Maine, certain data have been drawn from the 1959 survey in Maine. In the 1959 survey interviewing was done with more than 1,100 employers in industry and business. Below are summarized the results in terms of the per cent of the 1,166 employers indicating their reported difficulty in finding workers for different type jobs.[12]

Area of work about which interview inquiry was made	Per cent of employers indicating difficulty in finding workers
Managers, supervisors	1.6
Technical and related	3.1
Skilled tradesmen and craftsmen	60.7
Sales and distribution	10.3
Clerical and secretarial	9.5
Agriculture and related	2.1
Operatives, semiskilled	8.4
Service workers	3.0
Persons with sufficient basic education	1.2

Among the skilled trades the specific occupations mentioned most frequently by the interviewed employers were the following:[13]

Occupation	Frequency of mention
Automotive mechanics	80
Carpenters	54
Plumbers and steamfitters	32
Machinists, tool and die makers	32
Masons, bricklayers, cement finishers	27
Printers and compositors	27
Electricians	21
Auto body and fender repairmen	19
Cooks, bakers, and chefs	19
Mechanics: general, marine, farm machinery	18
Cabinetmakers and specialty woodworkers	16
Sheet metal workers	13

[12] "A Study of the Needs for Vocational and Technial Education in Maine," 1959. p. 50.

[13] Ibid., pp. 50-51.

In the 1959 survey the employers interviewed were asked about the types of training which would help their industries. The per cents of response are shown below.[14]

Type of training for workers	Per cent of employer respondents
Preparatory programs at the high school level	48.5
One- or two-year programs at the post-high school level	54.6
Short unit preparatory training programs	13.3
General upgrading for employed workers (evening)	11.6
Specialized supplemental training for workers (evening)	25.9

The foregoing sets of data indicate the rather startling shortage of skilled tradesmen and craftsmen (60.7 per cent of the interviewed employers so indicating) and also how these employers think the shortages might best be eliminated (the highest percentage favoring the post-high school programs).

Table 1.5 has been prepared to show to what extent the high school students of Maine were enrolling in various major courses or curriculums in the 1960-61 school year. The numbers in trade and industrial and other types of vocational education appear to be somewhat low in comparison with the needs as expressed in 1959 by Maine employers.

TABLE 1.5

MAJOR COURSE ENROLLMENTS ON HIGH SCHOOLS, 1960-61

Major course	Number	Per cent
College preparatory	28,438	50.5
General	24,120	42.7
Business education	2,260*	4.0
Agricultural education	1,101	1.9
Distributive education	14	**
Trade and industrial education	517	.9
Total	56,450	100.0

Source: State Department of Education reports (subject to small error since vocational offerings in academics are not included).

*Estimated on basis of Business Education authorities that 20 per cent of business course enrollments are vocational.

**Less than .5 per cent.

[14] Ibid., p. 52.

In Figure 1.1 are presented two circle graphs which provide a ready comparison between the employment distribution in Maine and the distribution of high school pupils in a recent year (1960-61) among the major courses or curriculums. These graphs reflect the data shown, respectively, in Tables 1.4 and 1.5.

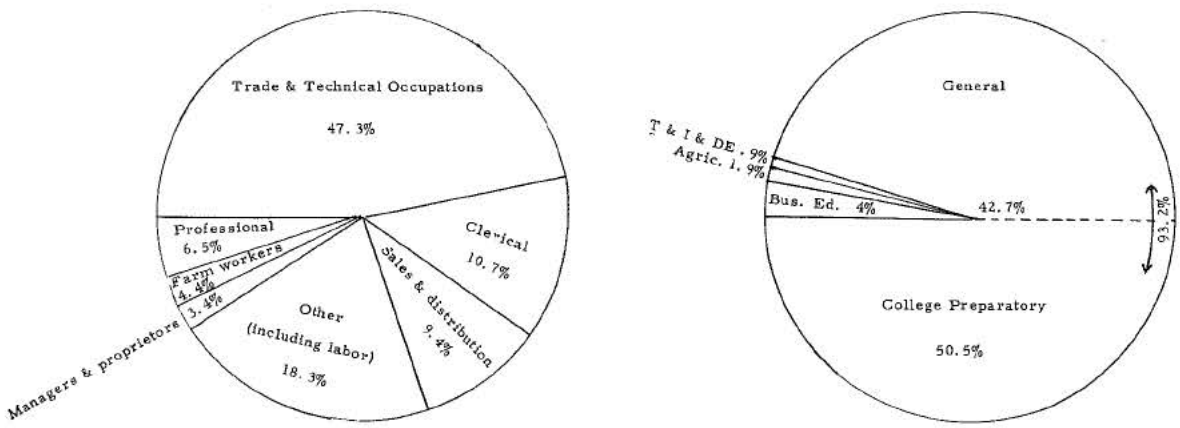

Fig. 1.1 Maine's Employment Distribution in Relation to High School Majors

That Maine employers are willing to cooperate with public education in meeting the employment needs of the State is shown in the data below, which came from the interviews reported in the 1959 survey report.[15]

Type of cooperation	Per cent of employers interviewed who suggested it
Have representative from industry serve on an advisory committee for the school	78.9
Permit selected employees to serve as instructors in the school program	62.8
Employ graduates trained to meet employers' needs	77.2
Refer employees to supplemental training programs	67.5

[15] Ibid., p. 53.

Description of a High Quality Skilled Trade Program

It is the belief of the Survey Staff that each vocational educational program either should be maintained at the highest level of excellence possible or no attempt should be made to provide such instruction. Since there is considerable evidence that many persons in Maine are uncertain as to just what a quality program of skilled trade instruction is, an attempt is made here to describe such a program.

Facilities

The physical facilities should be attractive and interesting to the students and staff and the citizens of the community. They must be planned in terms of the area of instruction to be offered. Normal classroom size space or other makeshift housing does not meet the educational specifications of quality vocational courses. The equipment must be as similar as feasible to that of commercial establishments in which graduates are to be employed. Particularly important are the variety, age, and size of the tools, machines, and materials used in the instructional program.

The equipment and building should be well painted and maintained, and the housekeeping should be such that both students and visitors become impressed with the organization and care of the facilities.

Instructional Staff

The instructional staff must be skilled and knowledgable in the subject (occupation) to be taught. They must also have a desire to work with young people and possess the social attributes that will inspire each student to follow the example set by the teacher.

The instructors must also either have in advance or be provided on an organized in-service basis professional instruction in the skills and technical knowledge of teaching. Such skills as curriculum planning and development, selection and/or preparation of instructional materials and their appropriate use, effective methods of presenting a demonstration, construction and use of audio-visual teaching aids, and student evaluation must be attained by the vocational instructor if an instructional program of excellence is to be provided.

The Course of Study

The course of study for a vocational trade and industrial program must be prepared in written form and based upon the present and potential needs of newly employed persons in the particular occupation. The objectives of the program must be clear-cut and the course of study developed in line with these objectives. A course of study must also reflect a reasonable range of instructional units possible to be taught in the time available. It must recognize that the total range of skills and knowledge that exists between the novice and the fully trained artisan can never be provided by the school in the time normally available.

Selection of Students

Each student indicating an interest in a vocational course should have the best counseling available to minimize wrong choices. This should include combination of testing, particularly those tests which measure the special characteristics required in an occupation, personal interviews with someone skilled and experienced in the occupation (usually the vocational teacher), a review of past school record and assurance that the student is sincerely interested in the vocation being contemplated. Each vocational area must have its own established selection standards which are based upon the employment specifications of employers.

Some service and semiskilled occupations may consider admitting students below an average of 95 I.Q. The skilled trades (i.e., machinists, automechanics, etc.) require an I.Q. of 95 or above, while most technical programs, particularly in the engineering and medical fields, need students of college caliber - those with I.Q's. of 110 or above.

While there may be individual exceptions due to either an intense interest or abnormal concentration, it is exceedingly unfair to both the student and to potential employers if an attempt is made to provide vocational instruction to persons unable to profit from such instruction.

Program Supervision

Vocational education is special education and requires special competencies on the part of supervisory personnel. Supervision implies all the functions which need to be implemented that will result in improved instruction. Due to the special characteristics and qualities of the teachers of trade and industrial education, supervision of an organized nature is imperative if high quality programs of instruction are to be developed and maintained.

Men and women selected as teachers of these courses come to the classroom and shop with occupational competencies within their chosen vocation but usually without professional preparation for teaching.

Schools having larger programs (three or more teachers) should provide adequate time to a vocationally qualified local person for carrying out supervisory and coordinating functions essential to quality vocational education. Smaller centers (two or fewer teachers) will have to depend primarily upon State supervisory and teacher training services.

Placement and Follow Up

No successful program of vocational instruction in trade or technical occupations can be considered complete without special efforts to place graduates appropriately in employment and to follow up these graduates to evaluate the success of the program. The State Employment Service should be utilized as an aid to employment, but the school must accept major responsibility for this function. No person is better acquainted with the special abilities and interests of the student than the vocational teacher. He usually is, or should be, well informed about the needs and requirements of the family of occupations for which he is helping to prepare students. It naturally follows, therefore, that the teacher is best able to assist in matching students to jobs in keeping with the students' interests and abilities and the needs of the employers

Time Allotments

Figure 1.2 illustrates the minimum time distribution for a quality trade and industrial program. This figure shows its application to a six-hour school day of either six or eight periods It illustrates also that vocational students cannot be expected to major in a trade or industrial occupation and still find time to take a large number of required high school subjects during the two-year period of the program.

If a student is not planning to go on to college, then certainly 10 full years of general, or academic, education plus one-fourth to one-third of the last two years should be adequate. Two-thirds to three-fourths of two school years is little enough time to prepare young persons to take their productive place in their communities and become self-sufficient citizens.

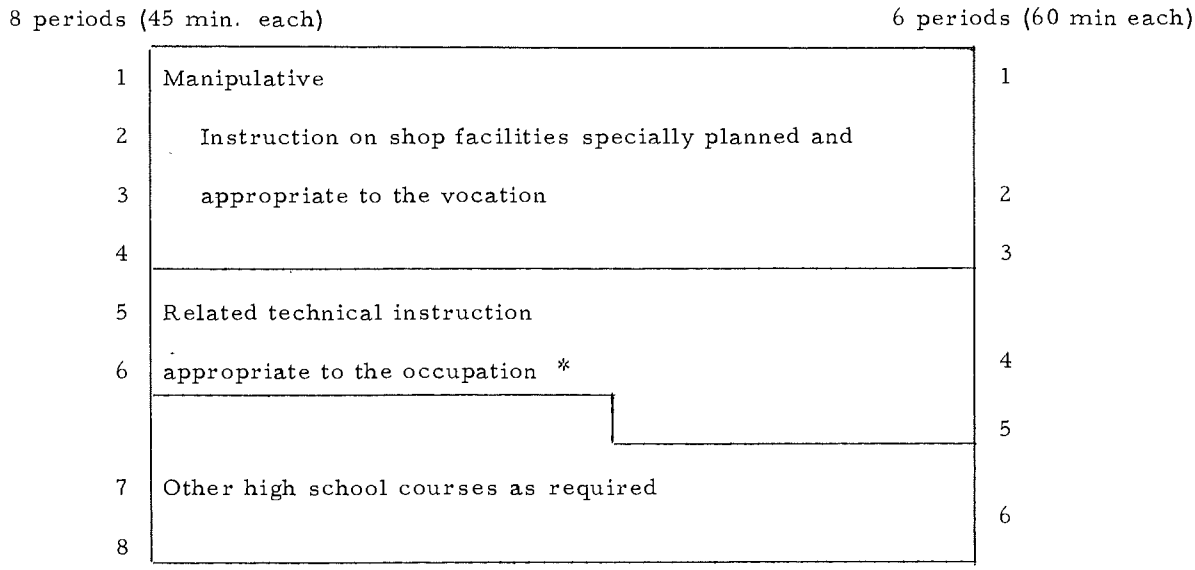

Fig. 1.2. Normal Time Distribution for Trade and Industrial Program

*May either be unit instruction with mathemathics and science applications taught as needed or as mathemathics and science courses specially planned to teach the principles of the subject matter related directly to the occupational area.

Below are presented average distributions of time devoted to general education, shop or manipulative experiences, and technical information (including theory) which should be provided for three types of trade and industrial education programs.

For the service and semiskilled occupations, as indicated below, the greater emphasis is on shop instruction, with general education being second and technical knowledge third. This area represents such occupations as nurse's aide, shoe repair, tailoring, farm machinery repair, machine tool operation, woodworking, and cosmetology.

Major division of the curriculum (service and semiskilled occupations)	Per cent of student time
Basic science and mathematics instruction Theory instruction	13.5
Laboratory or shop instruction	50.0
General education courses	36.5
	100.0

Normally the above is implemented by a two-year cooperative or day school program. A one-year cooperative program may operate but must meet the standards indicated below for skilled trades instruction.

For such skilled occupations as drafting, machinist, automechanics, practical nursing, plumbing, sheet metal, watchmaking, radio and T.V. service, tool and die making, aircraft mechanics, and printing, the major emphasis (as indicated below) is again on the manipulative skills, but considerable more knowledge of a technical nature is required; thus, a reduction is imperative in the amount of time devoted to general education courses. The program normally operates for two-years.

Major division of the curriculum (skilled trade and technical specialist occupations)	Per cent of student time
Basic science and mathematics instruction and Theory instruction	25
Laboratory or shop instruction	50
General education courses	25
	100

For the highly technical occupations such as engineering or medical technicians much less time (as indicated below) is given to instruction in manipulative skills, with a corresponding increase in theory and technical mathematics and science courses as well as a reasonably large portion of time given to general studies. Programs of this type normally operate for two to three years.

Major divisions of the curriculum (highly skilled technical occupations)	Per cent of student time
Basic science and mathematics courses Theory	50
Laboratory or shop courses	15
General studies	35
	100

Accreditation of Programs

The question concerning accreditation and the awarding of the Associate degree by institutions such as MVTI has been raised in Maine by faculty, students, administration, the State Education Department, and employers of MVTI graduates. Some consideration should, therefore, be given in this report to accreditation.

A Variety of Accrediting Agencies

Higher education in the United States has developed with wide variations among institutions, under the control of diverse governmental agencies (state, county, district, city, and other divisions) as well as under the sponsorship of privately endowed foundations, religious denominations, and proprietary organizations. This is a characteristic of the American democratic society which can be sensitive to the desires of its people. The result has been that no single agency has exercised evaluative judgment as to the quality of the offerings of all institutions. Evaluative agencies have been established which point out differences among institutions, to encourage the development and maintenance of high standards of quality and to give proper recognition to those institutions that are worthy of such notice. Among these are the following:

1. State agencies which limit their accreditation to a single state: state department of education, state boards, state colleges, and other state agencies.

2. Regional accrediting agencies whose jurisdiction extends over several states and which are extra-legal associations of the institutional membership: the Middle States Association of Colleges and Secondary Schools; the North Central Association of Colleges and Secondary Schools; the Northwest Association of Secondary and Higher Schools; the Southern Association of Colleges and Secondary Schools, and The Western Colleges Association.

3. Special accrediting agencies developed for the purpose of evaluating specific parts or specific curriculums within an institution: The Engineers' Council for Professional Development (ECPD), The American Board of Optometry, The American Dental Association, The National League of Nursing, etc.

The agencies represented in the first two groups are primarily concerned with the evaluation of the entire institution. The state agency is the source of authorization for the granting of degrees. If curriculums meet standards established by the state agency, then recognition is usually given by authorizing the degree: Associate, Bachelor's, Master's, etc.

The third group evaluates individual curriculums; e. g. , the American Board of Optometry evaluates Optical Technology or Ophthalmic Dispensary curriculums; the American Dental Association evaluates the Dental Hygiene curriculums, etc.

Accreditation for Engineering Technician Programs

ECPD is the recognized accrediting agency for technical institute curriculums designed to train engineering technicians. Since this is the agency that would evaluate curriculums at MVTI to determine their eligibility for accreditation, a somewhat detailed description of procedures and measuring instruments will be given. The objectives and procedures of ECPD are listed in its 29th Annual Report. [1]

> In an effort to serve industry and the engineering profession generally by stimulating the development of a better balanced system of technical education, the ECPD in 1944 approved a sub-committee on Technical Institutes within the Council on Engineering Schools. After several years of study, the sub-committee recommended and subsequently established a basis for accrediting programs of technical institute type. . . . Each curriculum is approved in terms of quality and accredited in the light of its own purpose, content and scope.

The committee decided that curriculums in technical education lying between professional engineering and the trades level in the following types of institutions would be included:

1. Technical Institutes, endowed or publicly supported
2. Junior Colleges offering technical curriculums
3. Divisions of colleges or universities
4. Specialized schools operated by governmental agencies
5. Proprietary schools operated by individuals or organizations
6. Vocational-technical schools operated by governmental agencies
7. Extension or part-time divisions of these institutions.

Curriculums that meet the following criteria are eligible for accreditation:

1. The purpose is to prepare individuals for various technical positions or lines of activity encompassed within the field of engineering, but the scope of the program

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[1] Engineers' Council for Professional Development, 29th Annual Report. pp. 45-46.

is more limited than that required to prepare a person for a career as a professional engineer.

2. Programs of instruction are essentially technological in nature, based upon principles of science, and include sufficient post-secondary school mathematics to provide the tools to accomplish the technical objectives of the curriculum.

3. Emphasis is placed upon the use of rational processes in the principal fundamental portions of the curricula that fulfill the stated objectives and purposes.

4. Programs of instruction are briefer and usually more completely technical in content than professional curricula although they are concerned with the same general fields of industry and engineering. They normally lead to the appropriate Associate Degree. Graduates of such curriculums are commonly designated as engineering technicians.

5. Training for artisanship is not included within the scope of education of the technical institute type.

In view of the diversification of technical institute type programs, the types of institutions that offer them and the undesirability of enforced uniformity, each program or curriculum falling within the conditions stated below will be recognized in terms of its own purposes, scope, duration, and content.

"Accredited curriculums shall satisfy the following:

1. Duration: Not less then two academic years of full-time residence work beyond the high school or the equivalent in part-time work.

2. Requirements for Admission: High school graduation or the equivalent. A high school transcript indicating graduation or certificate of equivalency must be available for all students.

3. Curricula: Technological in nature, employing the application of physical science and the techniques of mathematics to the solution of practical problems, and comprising a prescribed sequence of related courses in a scientific field, though not excluding a reasonable amount of elective subject matter.

4. Instruction: By accepted class and laboratory methods; laboratory work shall comprise an important part of each curriculum.

5. Teaching Staff: Qualified as to educational training and experience and sufficient in numbers to provide adequate attention to each student.

6. Educational Institution: An organized school or a division of an institution devoted to the specific aim of providing technical institute programs. A stable organization having adequate financial support and demonstrated capacity and achievement in the technical institute field. The school shall maintain a high standard of ethics in its educational programs and in all its dealing with students and prospective students. In its correspondence, published materials, and other public announcements, the statements shall be frank and factual and shall not be misleading.

7. Physical Facilities: Adequate for the purposes of the curricula offered"[2]

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[2]Ibid., pp. 45-46.

"The procedure and principles under which accreditation is conducted are as follows:

1. Individual curricula are accredited....

2. Rigid standards as a basis for accrediting are avoided in order to prevent enforced uniformity and to encourage educational experimentation.

3. Curricula are appraised on invitation of the institution offering them.

4. Curricula are accredited on the basis of both qualitative and quantitative criteria which are evaluated through visits of inspection by a committee or committees representing Engineers' Council for Professional Development and through data secured from catalogs, other publications, and questionnaires.

5. Qualitative and quantitative criteria include the following:
   a. Qualifications and experience of members of the faculty as well as the ratio of numbers of the faculty to the number of students taught.
   b. Standards and quality of instruction:
      (1) in technical courses
      (2) in basic scientific and other required courses.
   c. Scholastic work of students
   d. Records of graduates in industry
   e. Auspices, control, and organizations of the institution and of its technical institute division.
   f. Curricula offered and form of certificates or diplomas offered.
   g. Age of the institution and of the individual curricula.
   h. Basis of and requirements for admission of students.
   i. Number of students enrolled.
      (1) in the institution as a whole and its technical division.
      (2) in the individual curricula.
   j. Graduation requirements.
   k. Teaching staff and teaching loads.
   l. Physical facilities devoted to technical institutes curricula.
   m. Finance: investments, expenditures, sources of income"[3]

In 1960 there were 663 junior colleges (390 public and 273 private) listed in the Fifth Edition of American Junior Colleges.[4] There are reportedly 26 technical institutes in addition to the 663 junior colleges.

Of this total of 689 recognized two-year institutions, 381 offer two-year technical and/or semiprofessional curriculums. Yet ECPD lists only 33 (less than 10 per cent) having ECPD approved curriculums. In some instances, curriculums may be eligible for accreditation but evaluation has not been requested; many are not subject to ECPD because they are not engineering related. In any event, 348 institutions exist and perhaps prosper without

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[3] Ibid., pp. 45-46

[4] American Junior Colleges, Fifth Edition, 1960, American Council on Education, Washington, D. C.

ECPD accreditation. ECPD accredited curriculums can and do operate side by side with non-accredited curriculums in the same institutions.

A quick but somewhat subjective method of determining eligibility of curriculums for accreditation or for the awarding of the Associate degree is to compare an institution's curriculums with similar curriculums for the completion of which students receive the Associate degree. In general, when 50 per cent or more of a student's time is spent in shops and laboratories, the purpose of the curriculum is to develop manual skills at the trade level. This is characteristic of skilled trade education where 50 per cent of the school day, or a minimum of three hours, must be spent on shop work. Such curriculums would typically not warrant the granting of the Associate degree. In technical training, shop and laboratory time is usually less than 50 per cent of total time. Such training, then, may warrant the granting of the Associate degree.

To simplify comparisons between curriculums the Survey Staff has reduced the descriptions of course offerings to the following four areas:

1. Basic sciences which include mathematics, physics, chemistry, etc.
2. Theory courses which include time spent in the classroom on technical specialities.
3. Laboratory courses which include time spent in shops, laboratories, etc.
4. General studies which include English, sociology, psychology, etc.

Automotive Technology

Automotive Technology is not accredited by ECPD in any institutions that offer the curriculum. A comparison, however, will be made between Automotive Technology at MVTI and Automotive Technology at Hudson Valley Community College at Troy, New York, where graduates receive the Associate Degree.

Table 1.6 provides the comparisons as regards the relative percentages of time spent on each of the four basic divisions of the curriculum. It should be noted, too, that the stated objectives for the curriculum in the two schools differ considerably. The MVTI catalog says, "...to provide training in internal combustion engines with emphasis on the automobile." The HVCC objectives are, "The Automotive Technology program is designed for students who are interested in automotive work in industry. The curriculum provides for entrance into engineering technical level employment areas."

TABLE 1.6

AUTOMOTIVE TECHNOLOGY CURRICULUM AT MVTI COMPARED WITH AUTOMOTIVE TECHNOLOGY CURRICULUM AT HVCC

Major division of the curriculum	Per cent of total student time	
	MVTI	HVCC
Basic science courses	7.9	17.2
Theory courses	15.8	22.8
Laboratory and shop courses	62.2	46.1
General studies courses	14.1	13.9
	100.0	100.0

Source: Catalogs of the two institutions.

The 62.2 per cent of time allocated to shops and laboratories at MVTI is indicative of a trade program, with emphasis on skills. A sharp difference between the two curriculums is also found in mathematics although Table 1.6 does not show this. At MVTI, applied mathematics, a rather elementary course, is the only mathematics course given. At HVCC three courses in mathematics are scheduled, with the third course delving into calculus. Students at MVTI are scheduled for instruction for 35 hours per week; students at HVCC, for 28 hours.

Electronics Technology

Comparisons will be made in Table 1.7 between the Electronics Technology Curriculum at MVTI and the Electrical Engineering Technology-Electronics Option at Wentworth Institute, Boston, Massachusetts. Graduates from the Wentworth Curriculum receive the Associate degree; the curriculum is also ECPD approved. Also presented here are the catalog statements of the objectives of the Electronics Technology Curriculum for each school.

MVTI says, "Graduates of this course enter the electronics industry as engineering aides, technicians, testers, telephone switchboard installers, and servicemen in various fields requiring an electronics background. Emphasis on mathematics and electronics theory widens the scope of job opportunities."

Wentworth says, "Graduates are qualified for technical positions in development, manufacturing, test, research, installation, and maintenance in many and varied fields of electronics."

TABLE 1.7

ELECTRONICS TECHNOLOGY CURRICULUM AT MVTI COMPARED WITH ELECTRICAL ENGINEERING TECHNOLOGY-ELECTRONICS OPTION AT WENTWORTH INSTITUTE

Major division of the curriculum	Per cent of total student time	
	MVTI	Wentworth
Basic science courses	18.5	16.7
Theory courses	22.8	30.8
Laboratory and shop courses	44.3	47.1
General studies courses	14.4	5.4
	100.0	100.0

Source: Catalogs of the two institutions.

The MVTI curriculum compares favorably with that of Wentworth Institute as regards the emphasis on laboratory and shop courses is concerned. It is apparent that the MVTI curriculum is engineering related, and that emphasis is focused on technician training by an adequate spread among the various types of courses. Quality and depth of training can be determined by investigating the character of the courses in mathematics offered at the two institutions since mathematics determines to a large degree the quality and depth of the courses which it supports.

MVTI offers four mathematics courses:

MA11 Algebra and Trigonometry - a review of arithmetic, introduction to algebra, mental multiplication, fractions, linear and fractional equations, simultaneous linear equations, exponents and radicals, quadratic equations, variations, logarithms, graphical solutions, numeral trigonometry, sliderule

MA12 Mathematics - DC Circuits - Series circuits, resistence, wire sizes, elementary plane vectors, parallel circuits, meter circuits, voltage divider and distribution circuits, generator motor, battery circuits, Kirchoff's Law.

MA13 Mathematics - AC Circuits - Periodic functions, alternating current, fundamental ideas, series circuits, and parallel circuits

MA14 Applied Calculus - Functions, rates, limits, derivatives, differentials, maxima and minima, integrals, etc.

This is the same type of approach that is used with mathematics in the Building Construction Curriculum at MVTI. Evidently the purpose is to use applications from circuitry to develop the mathematics required to handle the problems involved. This tends to place the emphasis in the wrong area. Mathematics is an important tool of the technician, and the usual procedure in accredited curriculums is to emphasize mathematics and then make the applications to the technical areas involved.

Wentworth institute also has four courses in mathematics: Algebra and Trigonometry, Algebra and Introduction to Calculus, Elementary Differential and Integral Calculus, and Analytic Geometry and Mathematical Analysis.

From the catalog descriptions, Wentworth Institute provides greater depth and breadth in mathematics than MVTI, which could mean that the technical courses which mathematics supports could also have greater depth and breadth.

Classes in Electronics Technology at Maine Vocational-Technical Institute are scheduled 35 hours per week; at Wentworth Institute, 28 hours per week.

The awarding of the Associate degree is a prerogative of the State and is subject to the rules and regulations of the State for authorizing degrees. Criteria for granting the degree usually involve collegiate standards in courses of study, with sufficient rigor and quality to warrant the award. There is no question but that accreditation and the awarding of the Associate degree have status value for the student, for the faculty, and for the institution.

SECTION 2

HIGH SCHOOL PROGRAMS OF VOCATIONAL EDUCATION IN MAINE

The program of State approved vocational education programs in Maine for high school youth is composed of classes in agriculture, distributive education, home economics, and trade and industrial education. There is no program of commercial or office occupations training, as such, recognized or approved as vocational in the State. Isolated instances of business teachers who recognized the need for an occupational emphasis to this program were found by the Survey Staff and these few appeared, on the basis of comments made by educators and some employers, to be doing a creditable job of vocational preparation and placement of graduates.

Table 2.1 clearly shows that only about one-third of all public high schools in Maine offer any type of vocational education, and only slightly more than 20 per cent of the academies provide such courses. Of these latter schools all offerings are either vocational agriculture or home economics.

TABLE 2.1

DISTRIBUTION OF HIGH SCHOOLS AND ACADEMIES HAVING ANY TYPE OF APPROVED VOCATIONAL EDUCATION

	Public	Private*
Total number of high schools	177	60
Number offering vocational education of any type	57	13
Number having no vocational education	120	47

Source: Maine Educational Directory, 1961-62.

*Academies.

Table 2.2 presents statistical data concerning the Maine program of vocational education for the year 1960-61.

TABLE 2.2

STATUS OF HIGH SCHOOL VOCATIONAL EDUCATION IN MAINE, 1960-61

Vocational service	Number			
	Schools	Occupations offered	Enrolled	Teachers
Agriculture	28	1	1,101	28
Distributive ed.	1	1	14	1
Home economics	53	1	3,935	67
Trade & industrial ed.	13	8*	517	35
Total	95	11	5,567	131

Source: Statistical Records, Maine Department of Education.

*A cooperative part-time program is counted as one occupation.

One factor that appears evident from Table 2.2 is that agriculture and home economics programs are being offered in a greater number of high schools in Maine than are the other vocational programs. It would appear that with only one distributive education center and only 13 trade and industrial centers in operation that school authorities either are not interested in such courses or feel that they cannot provide this type of vocational instruction to their noncollege-bound students.

There appears also to be an excessively strong tendency in Maine for high schools to place almost their entire emphasis on college preparation, with little consideration for the more than 70 per cent of Maine's youth who will either enter the labor market or become homemakers upon graduation or soon thereafter. In fact only in one of all the conferences held by the Survey Staff with school officials, was the estimate of college entrance more than 25 per cent. The most common estimate was 20 to 25 per cent.

All superintendents of schools in Maine were sent a Survey inquiry which asked what per cent of their high school graduates went on to four-year colleges. Seventy-one out of 90 responses, or more than 78 per cent, reported that fewer than 30 per cent of their graduates enter college. In fact 40 superintendents indicated that fewer than 20 per cent go on to four-year professional training.

On the basis of these estimates more than 70 per cent, or 32,500 of the 1960 high school and academy enrollment of 46,349, are potential recipients of vocational preparation. It would appear, therefore, that a total enrollment of only 5,567 boys and girls in vocational education is almost insignificant in terms of need.

The Survey Staff visited a total of 24 of the 30 (or 80 per cent) trade and industrial vocational programs and the one distributive education cooperative program while school was in operation in May, 1962. Additional visits were made later to observe the facilities and consult with officials in the four additional schools offering trade and industrial programs. In a large number of these contacts the Survey Staff also reviewed local facilities for vocational agriculture and home economics education. Although these visits were made without formal notice, due largely to the pressure of time, the Survey Staff members were treated with extreme consideration and courtesy.

Vocational Education in Agriculture

Although the Survey Staff was engaged to look primarily at the need for skilled trade and technical education, they exerted some effort in looking at the other programs.

From the many discussions held by the Survey Staff and from their visits to a limited number of programs, it seems evident that the facilities for vocational agriculture are fairly adequate in a number of schools. They appear to be well planned and in several schools visited were recently constructed. The small sampling visited while in operation impressed the Survey Staff as being quality programs. It was impossible, however, to determine if the proper students were enrolled or if, as frequently occurs, many students were enrolled simply because no other vocational offering was available. In fact, the Survey Staff was informed that a particular school did not offer an industrial arts program because if such a course were offered, the agriculture program would suffer, and State reimbursement would be lost. It is difficult to understand this reasoning as justification for a particular high school course.

Table 2. 3 indicates that the present enrollment as well as the number of schools and teachers in Vocational Agriculture are as low as or lower than at any time since 1946. This table indicates also the very small extension program being offered to adults.

TABLE 2. 3

VOCATIONAL AGRICULTURE ENROLLMENT IN MAINE, 1946 through 1962

School year	Number of		Enrollees	
	Schools	Teachers	In school	Adult
1945-46	32	33	1,131	0
1946-47	39	39	1,282	0
1947-48	41	41	1,368	0
1948-49	41	44	1,330	0
1949-50	41	44	1,483	0
1950-51	43	47	1,499	30
1951-52	44	48	1,448	0
1952-53	42	43	1,322	39
1953-54	36	40	1,248	87
1954-55	43	46	1,491	43
1955-56	43	44	1,446	55
1956-57	43	44	1,406	66
1957-58	41	42	1,459	109
1958-59	37	39	1,360	136
1959-60	30	32	1,122	249
1960-61	28	30	1,101	285
1961-62	28	30	1,070	128

Source: Maine State Department of Education records.

Teacher training is a serious problem in vocational agriculture and will become more serious since the University of Maine is discontinuing this program due to the limited number of teachers needed and a small enrollment for the program. Eventually Maine will be

forced, therefore, to find replacement agricultural teachers in neighboring states or from Maine students who receive their teacher preparation outside the State.

Table 2.4 shows that four of the six states used in this survey for comparative purposes doubled or almost doubled their in-school vocational agriculture enrollment from 1946 to 1960. The fifth state, Utah, also had an increase of more than 20 per cent, while Maine actually lost high school enrollment between the two dates.

TABLE 2.4

IN-SCHOOL ENROLLMENT TRENDS IN VOCATIONAL AGRICULTURE IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	779	1,039	1,798	1,907
Idaho	1,433	2,915	3,706	3,647
MAINE	1,131	1,483	1,491	1,122
New Mexico	1,162	1,757	2,055	2,223
Oregon	2,222	3,393	3,981	4,195
Utah	2,683	3,614	3,390	3,311

Source: U. S. Office of Education, Digest of Annual Reports... Washington, D. C.

Table 2.5 compares the adult vocational enrollment in agriculture in these same six states. These data indicate that Arizona, New Mexico, and Maine offer agricultural instruction to very few adult farmers, while Idaho, Oregon, and Utah have had rather large enrollments in recent years, Maine has shown a strong growth in enrollment from 1955 to 1960.

TABLE 2.5

ADULT ENROLLMENT TRENDS IN VOCATIONAL AGRICULTURE IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	--	1,092	263	96
Idaho	170	--	87	659
MAINE	--	--	43	240
New Mexico	31	--	--	--
Oregon	306	3,375	1,031	1,297
Utah	1,951	3,319	1,336	858

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D. C.

Vocational Distributive Education

With the emphasis placed upon the tourist industry by the State of Maine, it is difficult to understand the very small program offered in the sales and distributive occupations. With the large number and variety of entry jobs in the field of distribution, this program can open the door to employment for many high school graduates who will not be going on to college. The cooperative feature of the high school program also makes it economical to initiate as well as valuable as a means of providing a very effective bridge from school to employment for many youth. The facilities observed in the one approved program appeared to be well planned and adequate.

Table 2.6 shows the small distributive enrollment from 1946 to 1962.

TABLE 2.6

DISTRIBUTIVE EDUCATION ENROLLMENT IN MAINE, 1946 through 1962

School year	Number of			
	Schools	Teachers	Enrollees	
			In school	Adult
1945-46	1	1	34	0
1946-47	1	1	35	0
1947-48	1	1	47	0
1948-49	1	1	32	51
1949-50	1	1	35	20
1950-51	1	1	25	0
1951-52	1	1	15	0
1952-53	1	1	20	0
1953-54	1	1	13	0
1954-55	1	1	17	0
1955-56	1	1	11	0
1956-57	1	1	24	0
1957-58	1	1	24	49
1958-59	1	1	18	58
1959-60	1	1	13	55
1960-61	1	1	14	0
1961-62	1	1	15	0

Source: Maine State Department of Education records.

The data in Table 2.7 clearly indicate that while other comparable states, with the exception of Arizona, have promoted and extended in-school vocational education for distributive occupations several times, Maine had in 1960 only slightly more than one-third her 1946 enrollment.

TABLE 2.7

IN-SCHOOL ENROLLMENT TRENDS IN VOCATIONAL DISTRIBUTIVE EDUCATION IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	105	202	91	133
Idaho	32	--	13	180
MAINE	34	35	17	13
New Mexico	97	253	279	438
Oregon	188	335	474	697
Utah	98	466	427	389

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D. C.

At the adult level Maine is far below the substantial enrollments in all the states as shown in Table 2.8. In most states the adult enrollment in distributive education is many times the in-school enrollment, and while this is also true of Maine, only 51 persons were served during 1960. In fact, in two of the selected years Maine had no distributive courses for adults.

TABLE 2.8

ADULT ENROLLMENT TRENDS IN VOCATIONAL DISTRIBUTIVE EDUCATION IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	4,639	1,680	1,130	1,065
Idaho	84	660	--	698
MAINE	--	20	--	55
New Mexico	174	203	110	801
Oregon	208	1,626	321	1,287
Utah	6,685	7,546	4,353	3,627

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D. C.

Vocational Education in Home Economics

The Survey Staff observations of home economics programs were extremely limited. They consisted mainly of looking at local facilities and conferences with local administrators and the home economics State staff.

It is generally accepted that all girls should have the benefit of this program as they will all be homemakers either as family members or as wage earners.

Since this survey is involved primarily with skilled and technical employment, a somewhat casual review of the home economics program was considered sufficient. It would appear that with the limited number of girls enrolled in approved vocational programs, some expansion is needed in this area of education to meet the need adequately. Table 2.9 shows the Maine enrollments in vocational home economics from 1945-46 through 1960-61.

TABLE 2.9

VOCATIONAL HOME ECONOMICS ENROLLMENT IN MAINE, 1946 through 1961

School year	Number of			
			Enrollees	
	Schools	Teachers	In school	Adults*
1945-46	50	58	2,768	408**
1946-47	55	63	3,420	731**
1947-48	63	66	4,070	860**
1948-49	70	79	4,233	943**
1949-50	72	76	3,731**	953**
1951-52	69	81	4,341	0
1952-53	68	79	4,065	0
1953-54	60	71	3,557	0
1954-55	62	73	4,059	0
1955-56	63	73	4,243	78
1956-57	62	76	4,894	178
1957-58	61	75	4,362	168
1958-59	58	70	5,204	249
1959-60	56	68	4,071	141
1960-61	54	69	3,935	142

Source: Maine State Department of Education records.

*Not reimbursed from Federal funds.
**U. S. Office of Education, Digest of Annual Reports..., Washington, D. C.

The comparative data in table 2.10 show that the home economics program at the high school level more than doubled between 1946 to 1960 in five of the six states, including Maine.

In the adult area of vocational home economics education Maine has failed to keep up with the other states used for comparative purposes. Table 2.11 clearly indicates this fact as well as to show that no home economics instruction was provided adults in two of the selected years, namely 1955 and 1960.

TABLE 2.10

IN-SCHOOL ENROLLMENT TRENDS IN VOCATIONAL HOME ECONOMICS IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	3,941	5,079	6,916	9,917
Idaho	2,267	3,023	4,870	6,196
MAINE	1,888	3,731	3,993	4,091
New Mexico	2,311	3,248	4,081	5,022
Oregon	2,977	3,739	5,255	6,255
Utah	4,974	3,730	5,170	4,006

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D.C.

TABLE 2.11

ADULT ENROLLMENT TRENDS IN VOCATIONAL HOME ECONOMICS IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	1,129	3,101	1,634	1,753
Idaho	304	642	237	454
MAINE	408	953	0	0
New Mexico	513	933	285	98
Oregon	2,756	7,517	8,447	12,490
Utah	6,662	16,147	7,006	9,798

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D.C.

Vocational Trade and Industrial Education

Trade and industrial education is the educational service responsible for development of fundamental skills, applications of related science and mathematics, promotion and encouragement of safe working habits, understanding of the working relationships within an occupational area; and fitting the individual for useful employment. In fact, this last function is that exemplified by all vocational education. This educational program functions at the high school, post-high school, and adult levels and provides both preparatory (pre-employment) training for persons seeking productive employment, as well as extension or upgrading courses for employed workers.

The program serves the educational needs of boys, girls, men, and women who are employed in or who wish to obtain employment in the many service, skilled trade, and technical occupations.

Since the 1960 United States census reports that approximately 47.3 per cent of Maine's workers are employed within the occupations which are served by the trade and industrial educational services, it is clear that a strong program is essential to Maine's productive economy.

The Present Organization in Maine for Trade and Industrial Education

Figure 2.1 shows the organizational relationships of the various aspects of the State's program of trade and industrial education as they existed at the time of the survey.

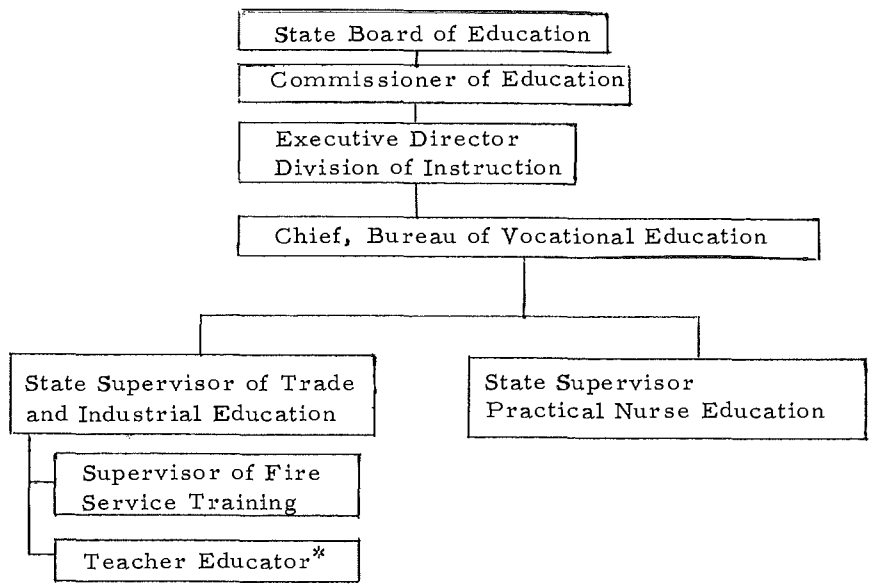

Fig. 2.1 Maine's State Organization for Trade and Industrial Education.

*Position not filled at time of survey.

This organization is in keeping with that of a great majority of other states except for the State Supervisor of Practical Nurse Education. While the practical nurse program requires specialized supervision, it is far from economical for one State supervisor to have responsibility for only three centers, each of which has a qualified local director. A number of states have made this position broader in scope by including all vocational instruction for girls and women as a part of this supervisor's responsibility.

The additional promotion of vocational education for girls and women possible under this suggested plan would result in an expanded program of preparatory and extension instruction in the State.

Promotion and implementation of vocational education in such areas as beauty culture, dental and medical assistants, clothing, food preparation and service, executive housekeeping, practical nursing, nurse aide, and legal and medical secretaries would greatly

contribute to both the successful employment of girls and women and to trained personnel being available to Maine employers. New areas of training for women through the Federal Area Redevelopment Act and/or the Manpower Development and Training Act also could become this individual's responsibility.

Such an approach would remove a serious inequality of responsibility among State personnel. Such a plan would require this specialized supervisor to report directly to the head supervisor of trade and industrial education as does the supervisor of fire service training.

Two extremely serious gaps existed in Maine's trade and industrial State staff at the time of the survey. First the position of head state supervisor was vacant; and, second, the established position of teacher educator had not been filled. Although the Chief of the Bureau of Vocational Education was devoting a great deal of extra effort to handling the more urgent phases of the trade and industrial program, it was evident that this was an impossible task in light of the duties of his regular position.

Figure 2.2 illustrates another way that the Trade and Industrial section within the Maine State Department of Education might be organized in terms of functions. Naturally the number of personnel will determine the extent to which each of these functions can be implemented. Most of these functions, however, must be performed by some qualified person at either the state or local level if a quality state program of vocational education in the trade and technical occupations is to be developed and maintained.

The Present Program of Trade and Industrial Education in Maine

Table 2.12 shows the program size of Maine's trade and industrial education from 1946 to 1962. These data clearly show that the high school program has had very little growth during this 15-year period. It is apparent that the year 1950-51 had the highest enrollment, with 743; while 1957-58 was the poorest year, with 382 high school youth attending trade and industrial courses.

In the adult vocational program the record shows considerable growth in the later years although the 1961-62 adult enrollment dropped considerably from that of the previous year. For comparative purposes the fire service training enrollments are reported separately. This program was inaugurated in Maine during the 1958 fiscal year.

Table 2.13 indicates that while Maine has barely held its own, in terms of in-school enrollments in trade and industrial education during the period since World War II, four of the six states have shown a fairly substantial growth.

In the area of adult vocational instruction, as shown in table 2.14, Maine has shown considerable expansion, having in 1960 more than nine times the 1946 enrollment. The development of the fire service training program has naturally contributed to this increase.

Table 2.15 shows the location and nature of the program offerings in the 13 high schools of Maine providing trade and industrial instruction during 1961-62. These data indicate that only eight different occupations were offered in 30 different classes in these schools. Eight of these courses were in machine trades and a like number in the building trades. Automechanics was offered in four classes while there were two programs each in electrical trades, sheet metal, and woodworking (including cabinetmaking) and one program in printing.

Three cooperative (part-time) programs were operating in 1961-62; and while these programs no doubt served a variety of occupations, the enrollment was extremely small,

FUNCTIONAL CHART OF SERVICES
TRADE & INDUSTRIAL EDUCATION

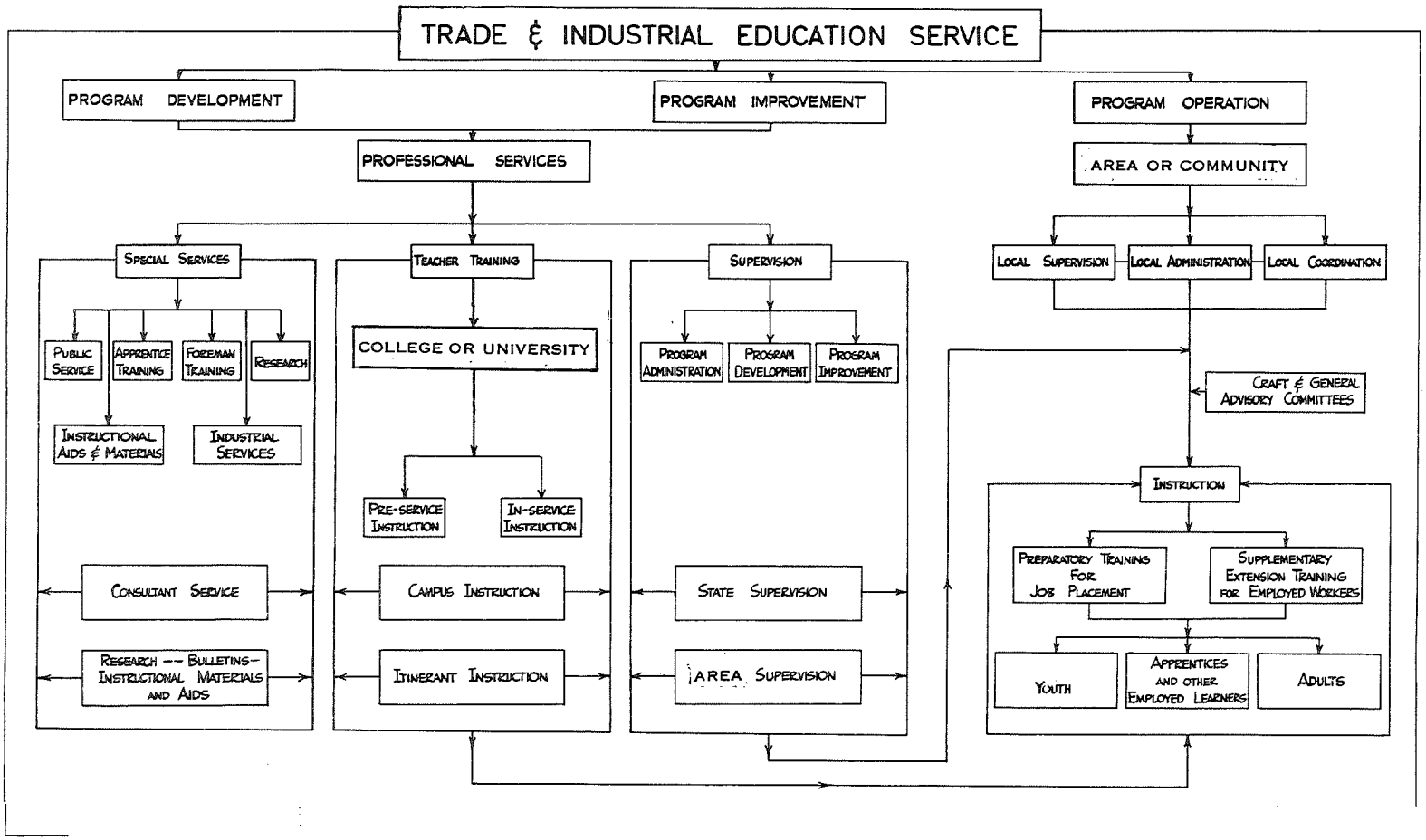

Fig. 2.2. Sample Organization Chart of Functions for State Trade & Industrial Education Services

TABLE 2.12

TRADE AND INDUSTRIAL EDUCATION ENROLLMENT IN MAINE, 1946 through 1962

School year	High school programs			Adult program enrollment	
	No. of schools	No. of teachers	Enrollment	Regular program for industry	Fire service programs
1945-46			459	490	
1946-47			468	321	
1947-48			607	563	
1948-49			643	692	
1949-50			620	832	
1950-51			743	965	
1951-52			646	830	
1952-53			612	664	
1953-54	*	*	626	878	
1954-55	12	35	553	397	
1955-56	11	33	537	375	
1956-57	11	31	399	694	
1957-58	12	34	382	1,764	1,764
1958-59	12	31	547	1,845	1,845
1959-60	11	29	416	1,520	1,520
1960-61	13	35	507	1,118	1,345
1961-62	15	37	462	703	1,116

Source: Maine State Department of Education Records.

*Data on the number of schools and teachers were not provided for the years 1946 through 1953.

TABLE 2.13

IN-SCHOOL ENROLLMENT TRENDS IN VOCATIONAL TRADE AND INDUSTRIAL EDUCATION IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	392	1,510	2,804	1,690
Idaho	902	685	1,049	941
MAINE	459	620	553	475
New Mexico	802	606	931	1,314
Oregon	1,087	1,297	1,892	1,435
Utah	1,661	1,874	1,731	2,225

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D.C.

TABLE 2.14

ADULT ENROLLMENT TRENDS IN VOCATIONAL TRADE AND INDUSTRIAL EDUCATION IN SELECTED STATES FOR SELECTED YEARS, 1946 through 1960

State	1946	1950	1955	1960
Arizona	1,652	1,432	4,702	7,877
Idaho	561	1,662	1,518	2,760
MAINE	228	836	396	2,048
New Mexico	311	1,321	648	1,842
Oregon	3,853	6,547	6,693	7,554
Utah	2,338	4,015	4,650	3,969

Source: U. S. Office of Education, Digest of Annual Reports..., Washington, D.C.

TABLE 2.15

PROGRAM OFFERINGS IN TRADE AND INDUSTRIAL EDUCATION IN THE CITIES OF MAINE, 1961-62

Center	Programs offered							
	Auto mechanics	Bldg. trades (carpentry)	Electrical	Machine trades	Printing	Sheet metal	Woodwkg. (cabinet making)	Part-time coop.
Augusta								(X)
Brewer	X					X		
Brunswick		X		X				
Kennebunk								X
Machias								(X)
Millinocket		(X)		(X)				
Portland	X		X	X	X		X	
Rockland		X		X				
Rumford		(X)		(X)				
Sanford	X	X		X				
Waterville	X	X	X	X				
Westbrook		X		X		X	X	
Windham		X						
Total	4	8	2	8	1	2	2	3

Source: Survey Office records.

NOTE: At least one member of the Survey Staff visited all T and I centers. Those programs designated (X) were visited after school had closed in the spring of 1962.

totaling only 35 students in the three centers. For purposes of this survey the three co-operative programs were considered as one occupational offering.

Table 2.15 shows also that the Survey Staff visited 24 of the 30 programs, or 80 per cent, while school was in operation. The other six programs, in four schools, were visited in August.

The data in table 2.16 show that of the 24 largest cities and towns of Maine only 10 offer vocational trade and industrial education programs to 467, or 2.2 per cent, of their

TABLE 2.16

POSITION OF TRADE AND INDUSTRIAL EDUCATION IN THE MAJOR CITIES OF MAINE POPULATION--5000 AND OVER AND AN ESTIMATED POTENTIAL ENROLLMENT

City	1960 population	High school enrollment 1961-62	Trade and industrial enrollment 1960-61*	Trade and industrial enrollment potential (10%)
Auburn	24,449	1,016		102
Augusta	21,680	1,063	12	106
Bangor	38,912	1,501		150
Bath	10,717	580		58
Biddeford	19,255	505		50
Brewer	9,009	548	48	55
Brunswick	9,444	1,141	54	114
Caribou	8,305	971		97
Gardiner	6,897	719		72
Houlton	5,976	563		56
Lewiston	40,804	1,684		168
Millinocket	7,318	766	29	77
Old Town	8,626	438		44
Portland	72,566	2,197	88	220
Presque Isle	12,886	677		68
Rockland	8,769	689	23	69
Rumford	7,233	453	34	45
Saco	10,515	655		65
Sanford	10,936	867	55	87
Scarboro	6,418	433		43
Skowhegan	6,667	554		55
South Portland	22,788	1,519		152
Waterville	18,695	919	65	92
Westbrook	13,820	845	59	85
Total	210,334	21,303	467	2,130

Source: United States Census data provided by Maine State Department of Economic Development; enrollments from Maine State Department of Education records.

*Actual.

high school youth. On the basis of a "rule of thumb", generally accepted by vocational educators, 10 per cent of high school students will choose a trade and industrial course when available. At least 2,130 Maine students, or almost five times the number enrolled, should, therefore, be served by this vocational area of instruction. When the number of high school graduates who seek employment immediately upon graduation is considered (70 per cent), this potential enrollment of slightly over 2,000 looks very small.

Supervision of Instruction

The almost complete absence in Maine of organized local supervision of trade and industrial programs by either State or local personnel was emphasized to the Survey Staff by the spontaneous and pertinent questions concerning vocational instruction asked by a great majority of the teachers visited. It appeared that these teachers were searching for some type of professional assistance to help them upgrade their instruction. Only in isolated instances did it appear that enthusiasm was wanting. In fact, the need for some organized system of inservice teacher improvement appears, as a result of the survey contacts, to be one of the most imperative needs in vocational trade and industrial education in Maine. There is no organized program or collegiate relationship at the present time to prepare occupationally qualified persons as competent vocational trade and industrial instructors in Maine.

Teacher Education in Trade and Industrial Education

Although the State organization chart already shown as figure 2.1 indicates a position for a teacher educator in Trade and Industrial Education, this position has never been filled, and the Survey Staff was informed that there are tentative plans to change this position to that of Industrial Arts Supervisor. While the effort to employ a State Supervisor of Industrial Arts is commendable, the immediate need is for Trade and Industrial teacher educator. Industrial arts teachers are professionally prepared teachers while trade and industrial teachers must depend entirely upon a state teacher educator for help in curriculum development, teaching methods, use of teaching aides and the other skills of teaching if their instruction is ever to be upgraded. At the present time the absence of such teacher education services is one of the most serious deficiencies in Maine's program of trade and industrial education.

Program Evaluation

It became evident from the personal observations of the Survey Staff that a great deal is left to be desired in the quality and adequacy of the housing and equipment in many local trade and industrial programs. Old delapidated school buildings, sheds, and school basements were being used to house the program. Such conditions would prevent the best of instructors from operating a high quality, well-organized program of instruction. The State staff should review such conditions and either require improved facilities or withdraw approval of the program. Such conditions, when approved for use by the State, only furthers the present attitude, on the part of a great many persons, that the vocational trade and industrial program is second-class education and only for the low I.Q. student.

Program Plan

The review of operating programs showed that every program operated on the basic principle of a three-hour shop period; and that, in most cases, additional instruction of a related technical nature was provided. Only 62 per cent of all students, however, received related instruction, which in most cases was general in nature since students of several occupations were scheduled in the same class regardless of the variety of needs in the several occupations.

Teacher Contacts

Personal discussions were held with 29 of the 32 skilled-craft teachers and two of the three part-time coordinators; and, in general, the Survey Staff was favorably impressed with both the dedication to teaching and the degree of occupational competency evidenced by these teachers.

Financial Support

Perhaps the second greatest need discovered in Maine through these field contacts is for greater local financial support for both equipment and supplies.

It is highly questionable if a prospective employer of a vocational program graduate would be favorably impressed by the equipment, the housing, or the supplies available for instruction in a great majority of the schools visited. Quality programs of vocational instruction are totally impossible in a number of these situations even when the teaching staff is dedicated and skilled.

Supplies and Equipment

In terms of supplies, one approved vocational program was reported to have available a total of only $450 for instructional supplies for the full school year. This deplorable condition contributes to either a search for small industrial arts type projects or scavenging for scrap and surplus materials from local firms - both a waste of the instructor's time. Neither system results in an organized program of instruction adequate for a quality program. In only two centers was it reported that the supply budgets were adequate to provide the quality and variety of instruction essential to the occupation.

Considerable old and obsolete equipment was observed in use, and in several centers the size and quality of space available for the vocational program were not only inadequate but in a number of cases also presented an impossible condition.

Advisory Committee

Organized advisory committees composed of employers and employee representatives within a local community were conspicious by their absence. In only two communities were such committees organized and functioning even through experience has shown that no vocational program in trade and industrial education can function successfully without the consultant help, and relationships established, by members of these committees.

Student Selection, Placement, and Follow Up

Although appropriate student selection is paramount to any successful educational program which leads to occupational placement, not one local school utilizes any effective selection procedures for its vocational programs. The absence of exploratory opportunity in industrial arts programs (general education) in many centers no doubt makes it more difficult for Maine high school students to make wise vocational choices with assurance. It appeared also that much was left to be desired in terms of constructive effort on the part of guidance personnel to help students select a vocation and enroll in the proper vocational program. The State Employment Service testing program was found to be used as an aid in student selection in only two schools.

In too many instances a general philosophy seems to the Survey Staff to prevail on the part of a number of school administrators in Maine that no intelligent student should enroll in a vocational program.

A serious absence of organized placement programs for vocational graduates was evident as was the lack of follow up of past graduates. It is clear that where a local supervisor or director is employed and provided adequate time, much more is accomplished in selection, placement, and follow up than in those centers where the teacher must perform this service.

Confusion of Objectives

One of the most frequent conditions met by the Survey Staff was the serious misunderstanding of the purposes and objectives of industrial arts education in comparison with vocational trade and industrial education.

Administrators, principals, and teachers were not at all certain of the difference between these two educational services. In fact, there appeared to be strong evidence that industrial arts courses are misinterpreted as occupational in terms of Section 107 of the State public school law which no doubt contributes to the confusion which exists. This interpretation is not only unfair and damaging to the innocent student but grossly unfair to employers who look to the schools for competent young workers.

Administrative Views

In almost all contacts with principals and other administrative personnel, it became evident to the Survey Staff that there is general agreement that public high schools should provide vocational instruction for the noncollege bound, but there was a great deal of disagreement as to what should be provided and the standards that should be maintained in any such special program.

The predominance of evidence as observed by the Survey Staff tends to show that local school authorities are not supporting adequately any quality program of vocational trade and industrial education when all elements of a quality program are considered, such as the philosophy of the school, student selection practices, quality of students admitted, housing available, equipment provided, supply budgets, organized programs of instruction, placement and follow up of graduates, and the use of local advisory committees.

Table 2. 17 presents certain comparative data for Maine and the six states selected by the Survey Staff for comparative purposes. When the various financial elements of vocational programs are studied, several important factors appear. To begin with, Maine ranks last among the seven states in total funds spent for vocational education. In breaking these expenditures into Federal, state and local funds, Maine ranks third in the amount of Federal funds received, fifth in State funds made available, but last in the amount spent by local schools on all vocational programs. In fact, even when State and local expenditures are combined, Maine's position remains seventh, or last, in terms of financial support to vocational education. This is true also of the amount of funds spent for supervision and teacher education and for local instruction. Only in the expenditures for administration does Maine spend more than four other states; namely, New Mexico, West Virginia, Idaho, and Arizona.

It is evident, therefore, that on the basis of most comparisons, Maine is far behind in promoting and supporting vocational education for the high school, post high school, and adults of the State.

An effort was also made by the Survey Staff to review the trend in financing vocational education in Maine during the years since World War II. Table 2. 18 data show that Maine has increased the total expenditures for vocational education from a total of $313,588 in 1946 to $822,034 in 1960. Federal funds in 1960 are approximately double the 1946 level, and 1960 State funds are about eight times those in 1946. However, the amount of local funds spent has increased only 1. 8 times the 1946 amount. In fact, from 1955 to 1960 there was only $38,489, or slightly more than 10 per cent, increase in local expenditures. This tends to show the unwillingness of local communities in Maine to support vocational education.

TABLE 2.17

COMPARISON OF CERTAIN FINANCIAL ELEMENTS OF VOCATIONAL EDUCATION BETWEEN MAINE AND SIX SELECTED STATES

Item	Maine	N. Mex.	Utah	West Va.	Idaho	Oregon	Arizona
State funds	$261,772	$ 175,843	$ 75,323	$ 419,065	$ 503,114	$ 452,387	$ 364,661
Local funds	272,135	707,144	1,287,250	1,290,124	533,823	926,815	920,304
Total state and local	$533,907	$ 882,987	$1,362,573	$1,709,189	$1,036,937	$1,379,202	$1,284,965
Federal funds	288,125	260,853	237,113	667,805	287,047	440,295	243,334
Total vocational expenditure	$822,032	$1,143,840	$1,599,686	$2,376,994	$1,323,984	$1,819,497	$1,528,299
All administration	$28,430	$2,120	$46,881	$24,376	$27,413	$72,219	$22,590
Supervision and teacher education	93,960	143,532	186,332	216,331	153,366	301,019	220,489
Instruction	699,643	998,189	1,166,472	2,136,287	1,143,205	1,496,259	1,285,220

Source: U. S. Office, Digest of Annual Reports, Washington, D. C.

TABLE 2.18

TRENDS IN FINANCING MAINE'S PROGRAM OF VOCATIONAL EDUCATION SINCE 1945

Item	1960	1955	1950	1946
State funds	$261,772	$126,034	$107,631	$ 31,286
Local funds	272,135	233,646	219,421	151,390
Total State and local	$533,907	$359,680	$327,052	$182,676
Federal funds	288,125	175,149	167,165	130,911
Total vocational expenditures	$822,032	$534,829	$494,217	$313,587
All administration	$ 28,430	$ 9,468	$ 9,560	NA
Supervision and teacher education expenditures	93,960	65,677	57,660	NA
Instruction expenditures	699,643	459,635	426,997	NA

Source: U. S. Office, Digest of Annual Reports, Washington, D. C.
NA - Not available on reports of this date.

It is evident that although there have been increases in expenditures in Maine, very little of this has been used to promote or expand the program since in most areas the enrollment has actually decreased.

These trends are extremely interesting when viewed from the industrial and employment trends nation-wide which have placed a premium on trained skilled and technical manpower, yet Maine has actually lost ground during this period.

Reactions of Non-Educational Personnel

Members of the Survey Staff contacted a number of persons not connected directly with education. The reactions of such personnel are summarized in the following paragraphs. Included in the observations are some gleaned from the Survey Staff's study of related printed material.

Governmental Agencies Personnel

At the State government level, interviews were held and pertinent printed materials were collected from the several agencies involved in the economic and manpower development of the State. Conferences were held with one or more persons in the Maine Department of Labor and Industry, the Maine Department of Economic Development, and the Maine Employment Security Commission. The representatives of these agencies were not only extremely courteous but very helpful in making needed data available. They were also highly interested in the purpose and possible contribution this survey may make to the State's manpower problem.

It was evident from the beginning that there was general agreement among these State government leaders that Maine was fortunate in having a labor surplus which might entice industry to move to the State if only this labor could be provided the skills and technical knowledge needed by today's industry.

The poor quality of programs and students enrolled in high school vocational programs was often expressed as a deterrent to expansion and growth of needed vocational education in Maine. There seemed to be little question but that a much expanded program is needed in machine trades, printing, electronics, and others.

The most frequent recommendation made by representatives of these governmental agencies was that all vocational skilled and technical instruction should be removed from the secondary schools. This opinion is not based on lack of need but rather on the apparent existence of an educational philosophy that appears to dominate secondary school officials and school committees. These key leaders appear to feel that high schools are basically academic, and that schools having vocational trade and industrial programs permit only the less able student to enroll.

Post-high school institutes such as MVTI and the planned Presque Isle School received high praise from the personnel contacted. Their only concern was the present limited enrollment. These programs, they felt, were of good quality, and the graduates were in demand by industry. One of their concerns, however, was that out-of-state employers actively recruit at MVTI and employ most of the good graduates. Since Maine industry does not make this effort, they must go out of State for skilled workers.

Apprenticeship Officials

The apprenticeship system used in many states to train skilled craftsmen is extremely small in Maine. With a skilled and technical labor force of 167,018 there are only 99 apprentice programs in the State, with 476 registered apprentices in training.

State and Federal apprentice training officials are concerned over both the quality of high school vocational students, who should be eligible for openings in the apprentice programs, and over the absence, in most cases, of related technical instruction for apprentices being provided by local public schools.

Industrial Employers

Contacts were made by the Survey Staff with a sampling of industries in the several communities visited. A concerted effort was made to reach top management in as many types of industry as possible. Visited by the Survey Staff were food processing industries, fisheries, public utilities, and manufacturers of shoes, paper, electronic equipment, textiles, and clothing. It was of considerable interest to the Survey Staff that collectively the personnel conferred with were in agreement that:

1. Public schools in Maine do not operate quality vocational trade and industrial programs.

2. Only the less able students are permitted to enroll in the vocational programs.

3. Industry is not asked by the schools for advice on how to improve their school programs to meet the skill needs of employers.

4. All employers are interested in having extension training available for their employees.

5. Schools such as MVTI are urgently needed not only to provide industry with technical manpower but to keep Maine's greatest resource, her young people, in Maine.

6. There is practically no communication between secondary education and industrial management although, as one person stated, "An estimated 80 per cent of all taxes in this area are paid by our plant and its employees."

7. Employers having used MVTI graduates are satisfied, but they would encourage the development of additional programs of higher technical level.

8. Noncollege-bound youth should have quality vocational preparation while in high school.

9. Industry, if approached, would support vocational and technical schools.

10. The State-required program for secondary schools appears to be dominated by the "college" philosophy of academic achievement for all rather than a comprehensive program to serve the varied needs of youth.

In addition to these reactions on which there was agreement, a number of other items of interest were learned by the Survey Staff in their conferences with employers. One industrialist, for example, expressed his pleasure at being contacted and by the fact that the State was concerned to the point of having the survey made. This same individual, incidentally, did not know that the local public schools in his community operated a vocational trade and industrial program. Again communications appeared to be a problem even in communities with vocational programs. Several other employers expressed the view that even if Maine industry could not employ all Maine youth, these youth should still have the opportunity for vocational and technical education in the area so that when they found it necessary to leave Maine for employment, they would have salable skills to help them compete favorably in the labor market.

In more than one location where the school officials were proud of their business (office practice) course, local employers were concerned over the fact that they could not use the product as the program was not geared to the skills and practices essential for employment. In none of these situations was there evidence that any real effort was made by the school to find what skills were needed or to use the benefit of an advisory committee. Evidently these were merely considered high school courses rather than organized vocational programs leading to employment.

Several employers expressed an interest in working with the local high school in the development of a quality cooperative programs in both office and trade and industrial occupations.

A considerable number of the employers contacted, including the State Highway Department, reported that they find it necessary to spend large sums of money with outside private agencies such as correspondence schools in order to obtain upgrading courses for their personnel. One company representative for example, stated that his company had a potential financial obligation of more than $20,000 if all employees now taking correspondence courses should complete them. Each of the employers expressed a willingness to shift this educational support to public educational agencies if only they could receive service. In at least one situation the Agricultural Extension Service of the University of Maine is planning to provide supervisory and leadership training for industrial personnel. Not only is this outside the responsibility of this particular service, but it is a direct responsibility of public vocational education through trade and industrial education. Industry in Maine, however, is grasping for educational straws wherever it can find them.

Organized Labor

From contacts made with leaders of organized labor, the Survey Staff was impressed by the reactions and opinions of this important segment of Maine's productive labor force.

Here again there was strong feeling that quality programs of vocational trade and technical education could not be had at the high school level due to the prevalent philosophy of secondary education in the State.

Strong feelings were evident that post-high school vocational centers were, in the opinions of these industrial leaders, the only possible way that high quality noncollege-bound students could be expected to have the benefits of quality occupational preparation. It was emphasized that employers were not interested in, nor could the highly skilled trades absorb the quality of students now enrolled in, the approved high school programs of trade and industrial education.

Labor leaders indicated also a strong need for high schools to plan for and provide strong programs of more practical mathematics, science, and industrial arts exploratory courses for the noncollege-bound student.

Questionnaire Responses of Certain Education Groups

It will be recalled from Section 1 that as a part of the survey of vocational-technical education in Maine, the Survey Staff sent to school superintendents and counselors two separate questionnaires dealing with the topic under study. The number sent has already been indicated in Section 1 of this report.

Responses of Superintendents of Schools

Section 1 indicated that 90 superintendents returned to SCHOOL SURVEY SERVICE their completed questionnaires. The respondents said that much more use is made in Maine high schools of the guidance and advisory services of the Maine State Department of Education in

home economics and trade and industrial education, than in agriculture and distributive education services.

One important kind of reaction from the superintendents was about the per cent of their high school graduates who the superintendents thought had the ability to profit, respectively, from four-year programs of post-high school institutions and two-year programs beyond the high school and also the percentages that they believe enter each of the two types of post-high school institutions. Table 2.19 summarizes the results of these reactions of the school administrators.

TABLE 2.19

SUPERINTENDENTS' OPINIONS OF PER CENT OF GRADUATES WHO COULD PROFIT FROM POST-HIGH SCHOOL EDUCATION AND THE PER CENT WHO ENTERED SUCH PROGRAMS

Item	Number of superintendents indicating					
	5% or fewer	6-10%	11-20%	21-30%	31-40%	over 40%
Ability to profit from:						
4-yr program	1	7	11	28	17	26
2-yr program	0	3	20	27	14	24
Number who enter:						
4-yr colleges	8	6	26	31	14	2
2-yr terminal schools	27	21	22	8	2	2

Source: Survey questionnaires.

These data tend to show that superintendents are generally realistic in their estimate of the number of graduates who enter four-year colleges and universities since 57 of the 90 respondents selected 11 to 30 per cent as their best estimate. This per cent is about the same as high school principals and others indicated during interviews with the Survey Staff.

When asked where needed post-high school programs of one- or two-year length should be located, the majority of superintendents recommended "somewhere in their section of the State." Evidently these educational leaders feel the area approach is the preferred way to bring vocational education to Maine.

In terms of the maximum distance they thought students would commute to a post-high school terminal program, 85 per cent of the superintendents responding indicated under 30 miles, while 95 per cent felt the distance would have to be less than 40 miles.

Sixty-two per cent of the superintendents believed that two-year post-high school terminal programs must be the responsibility of the State.

Fifty-nine per cent of the superintendents responding believed industrial arts education can contribute to an interest in trade and industrial education. They likewise agreed that few students taking college preparatory courses can, or do, enroll in courses such as typing, home economics, or industrial arts. Eighty per cent of the respondents believe that practical courses such as those named above are held in less esteem than college preparatory courses by both pupils and parents.

It is evident from the data secured through the survey questionnaire that superintendents believe educational television could be used effectively by vocational educators. These data show also that there is disagreement of opinion among superintendents as to their responsibility as school administrators for adult vocational education.

Two-thirds of the superintendents indicated that they believe vocational education strengthens the general (basic) education in their schools. One question asked of these superintendents, however, brought responses which tend to show the lack of their understanding of the principles of vocational education.

Table 2.20 indicates that a large number of superintendents feel that 46 to 120 minutes of class time is adequate for each of the four vocational services. Evidently they fail to appreciate that while the farm boy and girl taking agriculture or homemaking, respectively, is practicing the skills of his or her vocation at home during their hours away from school. On the other hand very few students enrolled in distributive or trade and industrial classes have the opportunity to practice the skills of their work at home; thus, they must be taught, and have adequate time to practice, the skills of the occupation during the school day.

TABLE 2.20

SUPERINTENDENTS' OPINIONS OF THE MAXIMUM TIME TO BE ALLOTTED TO VOCATIONAL CLASSES

Type of course	Number of superintendents responding				
	45 min	46-60 min	61-90 min	91-120 min	over 120
Agriculture	3	17	13	23	7
Home economics	4	24	21	27	4
Distribution	3	21	4	16	5
Trade and industrial	3	18	15	24	11

Source: Survey questionnaires.

Two-thirds of the superintendents responding indicated that there was a need to expand adult vocational offerings in their community, particularly in trade and industrial education.

Responses of High School Counselors

In an attempt to survey counselor opinion regarding guidance and vocational-technical education services and needs in the State, an inquiry was sent by SCHOOL SURVEY SERVICE to the principal of each high school in Maine asking that the inquiry be responded to by the head counselor or by the principal if he served in this role.

A total of 94 questionnaires were returned. Below is shown the distribution of returns by size of high school.

High school enrollment	No. of returns
Below 200	35
200-399	32
400-799	18
800-1,999	9
Total	94

Seventy-two of the 94 responding counselors worked in four-year high schools (grades 9-12). Responses were received from all 16 counties of the State.

One very interesting element of the survey questionnaire was the response of the counselors in terms of the number of vocational offerings in their schools. There were wide disparities in the numbers reported by the counselors and the actual numbers of the different types of programs in the various schools.

Counselors apparently did not know what an approved vocational program is or whether or not their high school had such a program. For example, the counselors collectively indicated that 53 per cent of all high schools offer seven more home economic programs, three more distributive education programs and 42 more trade and industrial programs than are approved in the whole state. With regard to agriculture their responses were 13 fewer than the number approved by the State.

It would appear that if so many counselors hold such a misconception as to what an approved vocational program really is, it may explain the lack of appropriate selection practices in the existing vocational programs, particularly in trade and industrial education. Almost 40 per cent of the respondents indicated that no counselors were employed in their school, while another 40 per cent have only one full-time equivalent counselor.

Almost all counselors reported that their programs provided for students to participate in course selection and career planning, and that provision is made for individual counseling with pupils. Only 18 per cent of the counselors responding had strong feelings that the high schools task was only to provide "good general education." It would seem, therefore, that better than eight out of every 10 counselors believe that the high schools should provide more tangible educational assets to the students.

Approximately 55 per cent reported a strong belief ("very much" or "much") that vocational teachers should be utilized in the total counseling program.

About 25 per cent of the counselors feel strongly that the citizens believe the schools are meeting the vocational education needs of the pupils. Twenty-two per cent indicate an opposite point of view, with somewhat over one-half of the entire group of respondents answering in the middle ("some or average") category on the five-point scale from "very little or none" to "very much."

With respect to the high schools' meeting the needs of their graduates who go on to college, the counselor respondents were more critical of the Maine high schools than they were in reflecting their judgment of citizen reaction to the schools' meeting vocational education needs. More than 95 per cent of the counselors responded "average" to "very little or none" when asked if adequate post-high school opportunities were available in the State of Maine.

Over 70 per cent of the schools "occasionally", "seldom," or "never" use organized group guidance programs. Only 20 per cent use such techniques on a regular basis. Seventy-one per cent of the schools responding regularly use individual counseling techniques. Cumulative record data and test data on students are regularly maintained by the majority of the schools.

Exploratory courses are regularly used in only 16 per cent of the high schools responding to the questionnaire. In the use of the visiting technique to help pupils make wise vocational choices, only about 9 per cent regularly arrange visits to the high school's vocational classes or to vocational or technical schools. On the reverse side 20 per cent of the counselors report that their schools regularly arrange or recommend visits to colleges.

Over 77 per cent of the counselors responding to the item on admissions admitted that their schools do not have admission requirements for enrolling pupils in vocational courses.

Only 17 per cent of the counselors report that students of high academic ability who have made a careful vocational choice are usually recommended to vocational courses, yet 51 per cent state that they usually enroll those who have difficulty with academic subjects Eighty-five per cent reported they usually recommend for enrollment in vocational classes those having a specific interest in the program, and 78 per cent usually enroll those having demonstrated ability along "vocational lines."

To summarize, it is apparent that the present limited guidance program in the high schools of Maine as well as a lack of knowledge concerning the nature, purpose, and type of student essential to sound vocational programs are strong deterrents to the development of an adequate program of vocational education at the high school level.

SECTION 3

POST-HIGH SCHOOL VOCATIONAL-TECHNICAL EDUCATION IN MAINE

College bound youth in the State of Maine have an excellent group of colleges, both private and public, from which to choose. Among the private colleges are such well-known institutions as Bates, Bowdoin, and Colby, offering courses primarily in the field of liberal arts. Other colleges perhaps less well known outside the State of Maine are Husson, Nasson, Ricker, St. Joseph's, St. Francis, Oblate College and Seminary, Bangor Theological Seminary, Northern Conservatory of Music. Northeastern Business College and Bliss College specialize in training for business. Thomas Junior College and Westbrook Junior College offer two-year courses, with some emphasis on programs permitting transfer to four-year institutions.

The public colleges sponsored by the State include Aroostook State Teachers College, Farmington State Teachers College, Fort Kent State Teachers College, Gorham State Teachers College, Washington State Teachers College, The University of Maine and its two-year College at Portland, and the Maritime Academy at Castine. These colleges serve the interests of students aiming for careers in business, teaching, engineering, and other professions. Many of these institutions are engaged in, or have completed, programs of building improvement and expansion in order to accept additional students and to improve the quality of other curricular offerings.

None of these institutions concern themselves with those students who desire trade and technical training at the post-high school level but at less than the four-year college degree level although developments in technology have created thousands of jobs in all kinds of endeavor which require trained workers. To fill the need for this kind of training, the State of Maine has established Maine Vocational-Technical Institute and is preparing to open a second institution, Northeastern Maine Vocational Institute. It is with this kind of education and with these two schools that this section of the survey report is concerned.

Maine Vocational-Technical Institute

The Maine Vocational-Technical Institute was founded in Augusta, Maine, in 1946. More adequate facilities were made available when Fort Preble at South Portland was acquired, and the Institute was moved to the new site in 1952.

Since MVTI was the only institution of its kind in operation in Maine at the time of the survey, examination of the Institute and its offerings was made in some detail. Visits were made to the campus; conferences were held with the administration and instructional staff; classrooms and laboratories were visited while classes were in session; student personnel records were studied; course outlines were reviewed; book lists were checked; catalogs and other printed material were read; equipment and buildings were evaluated; and a few students were interviewed. Data secured from survey questionnaires sent by SCHOOL SURVEY SERVICE to superintendents of schools within the State, guidance counselors of Maine secondary schools, MVTI students and graduates, and MVTI faculty members were analyzed and interpreted. Data concerning MVTI were also collected through conferences with employers of MVTI graduates and with leaders in industry, commerce, and labor.

Control

Maine Vocational-Technical Institute is under the direct control and supervision of the Maine State Board of Education. The authorizing legislation states:

> Technical and Vocational Schools.....the State Board of Education shall have authority to establish, maintain and operate State technical and vocational institutes to promote specialized training for returned veterans of World War II and other persons who give evidence of special aptitude or need and who desire specialized training designed specifically to train for service in trade, industry or commerce.[1]

Entrance Requirements

Graduates of approved high schools are admitted to MVTI, with some attention being paid to class rank as an indicator of ability to profit from the instruction offered. It is recommended by MVTI that all applicants have two years of high school mathematics and one year of physical science. Applicants in Industrial Electricity and Electronics Technology are expected to have two years of high school algebra and one year of physical science. Students whose high school records are questionable may be admitted by special examination. Adults 18 years of age or older who are not high school graduates may be admitted by examination.

Starting with the class entering in September, 1962, entrance examinations are required of all applicants. Applicants in Culinary Arts are required to take the GATB test administered by the Maine Employment Security Commission. The test is given at any of the several Commission offices. Results of the test are forwarded to MVTI where the results on the sections pertinent to aptitudes of Cooks and Bakers are used in measuring the acceptability of the applicant.

Applicants in all of the other curriculums must take the Engineering Physical Science Aptitude Test, which is administered at the applicant's high school or at MVTI.

Survey Staff inspection of a sample of the application forms of both accepted and rejected applicants indicates that, in general, recommendations concerning mathematics and science requirements are adhered to, and that the high school rank and success in the tests administered have considerable influence in the acceptance or rejection of the applicant.

Graduation Requirements

In order to graduate, a student must pass satisfactorily all subjects listed in the chosen curriculum. No mention is made in the catalog concerning the marking system and attendance requirements. Diplomas are awarded the graduates.

The Students at Maine Vocational-Technical Institute

In Table 3.1 data collected from the student personnel records at MVTI are shown concerning the relative extent of accepted and rejected applications as regards the entering class for the 1962-63 school year.

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[1] State of Maine Laws Relating to Public Schools, Chapter 41, Section 203, Revised Statutes, 1954, as amended.

TABLE 3.1

ACCEPTED AND REJECTED APPLICATIONS OF THE MVTI CLASS ENTERING IN 1962, BY CURRICULUMS

Curriculum	Accepted	Rejected	Per cent rejected*
Automotive Technology	47	60	56.1
Building Construction	31	41	56.9
Culinary Arts	24	18	42.8
Electronics Technology	32	55	63.2
Industrial Electricity	28	19	40.4
Machine Tool Technology	36	24	40.0
Marine Technology	38	12	24.0
Oil Burner Heating	14	4	22.2
Total	250	233	48.2

Source: MVTI records.

*Includes applicants who failed to follow through on payment of fees.

Inspection by the Survey Staff of the applications rejected gave evidence that a sizable proportion of these stemmed from lack of facilities to accommodate them rather than from the quality of the applicants.

Analysis of the student personnel records at MVTI indicates that the entering students for the 1962-63 school year are distributed as shown in Table 3.2. It is evident that the Institute is admitting many quality students in terms of their ranks in their high school graduating classes.

TABLE 3.2

HIGH SCHOOL RANK IN CLASS OF THE MVTI CLASS ENTERING IN 1962, BY CURRICULUMS

Curriculum	Rank in high school graduation class			
	1st quarter	2nd quarter	3rd quarter	4th quarter
Automotive Technology	5	15	27	0
Building Construction	9	16	6	0
Culinary Arts	0	5	15	4
Electronics Technology	9	14	9	0
Industrial Electricity	8	10	5	5
Machine Tool Technology	0	27	7	4
Marine Technology	15	4	10	7
Oil Burner Heating	0	5	9	0
Total	46	96	88	20

Source: MVTI records.

The following data concerning students and former students at MVTI were secured from the survey questionnaire administered to students and former students during the 1961-62 school year.

TABLE 3.3

RESPONSES OF STUDENTS AND FORMER STUDENTS OF MVTI CONCERNING THEIR HIGH SCHOOL LOCATIONS

High school location	Per cent of	
	Present students	Former students
Cumberland County (Portland)	39.3	32.7
Other Maine counties	59.6	65.4
Out of State	1.1	1.9
Total	100.0	100.0

Source: Survey questionnaires.

Distances traveled by present students and graduates of MVTI are shown in Table 3.4. These data were secured by questionnaire. It appears that a higher proportion of the current student body is willing to travel longer distances to the Institute than were the former students.

TABLE 3.4

RESPONSES OF STUDENTS AND FORMER STUDENTS OF MVTI CONCERNING DISTANCE TRAVELED TO MVTI

Distance	Per cent of	
	Present students	Former students
Less than 1 mile	25.1	22.1
1 - 3 miles	9.2	32.1
4 - 5 miles	13.8	13.6
6 - 10 miles	12.7	11.9
11 - 15 miles	4.5	6.5
16 - 20 miles	7.1	4.6
over 20 miles	27.6	9.2
Total	100.0	100.0

Source: Survey questionnaires.

Methods of transportation to and from MVTI used by 1961-62 and former students are shown in Table 3.5. It can be noted that bicycles and boats have apparently been substituted for the motorcycles and hitchhiking methods of the former students. The patterns of transportation of the two groups are otherwise quite similar on a percentage basis.

TABLE 3.5

RESPONSES OF STUDENTS AND FORMER STUDENTS OF MVTI CONCERNING METHODS OF TRANSPORTATION USED

Method of travel	Per cent of students	
	Present	Former
Own car	43.9	45.2
Car pool	30.4	31.3
Public transportation	2.2	2.6
Walked	21.3	19.1
Bicycle	1.1	0
Boat	1.1	0
Motorcycle	0	.9
Hitchhiked	0	.9
Total	100.0	100.0

Source: Survey questionnaires.

Reasons for present and former MVTI students deciding to attend MVTI and the percentage of present and former pupils designating each are given in Table 3.6. The major reason given was the nature of training available at MVTI. In second place was the influence of the personnel in the high schools from which the respondents graduated.

TABLE 3.6

RESPONSES OF PRESENT AND FORMER STUDENTS OF MVTI CONCERNING REASONS FOR ATTENDING THE INSTITUTE

Reason	Per cent of students	
	Present	Former
Recommended by friends and relatives	10.9	12.3
Recommended by present or former MVTI student	11.8	7.2
Recommended by employer	7.3	0.0
Recommended by high school personnel	21.2	14.8
Recommended by Armed Forces or V. A.	.7	5.5
Nature of training available	35.8	32.5
Location of school	13.8	10.9
Other	4.5	16.8
Total	100.0	100.0

Source: Survey questionnaires.

Questionnaire responses by students and former students of MVTI concerning reasons for choosing their curriculums at MVTI are summarized in Table 3.7. Preparation for a particular vocation was the reason given most frequently by the respondents.

TABLE 3.7

RESPONSES OF PRESENT AND FORMER STUDENTS CONCERNING REASONS FOR SELECTION OF CURRICULUM AT MVTI

Reason	Per cent of student respondents	
	Present	Former
Past experience in civilian life	17.4	15.9
Past experience in Armed Services	2.3	5.7
Desire to prepare for this vocation	55.9	56.7
Desire to continue previous education	14.2	14.7
Recommended by MVTI counseling service	.8	.6
Recommended by present or former MVTI student	5.5	2.0
Other	3.9	4.4
Total	100.0	100.0

Source: Survey questionnaires.

The students and alumni of MVTI were asked what courses taken at MVTI did they like best or least and, for the alumni, what courses had been most valuable to them after leaving MVTI. Physics, drafting, mathematics, related shop, English, and business management rated high in student and alumni opinions as to value: on the other hand, students rated drafting, business management, and mathematics as being least valuable in some curriculum.

In terms of the responses to the questionnaire to students, there appears to be no strong demand for the introduction of additional subjects except there is some need expressed for more mathematics. In general, present students and alumni alike are fairly well satisfied with their choices of curriculum since there has been a minimum of transfer among curriculums, and fewer than 10 per cent of the student respondents expressed a feeling that they should have entered a different curriculum.

Responses from present and former students to items in the questionnaire concerning the MVTI activities program are shown in Table 3.8. Not only did the present student body indicate that there was not too much emphasis on student activities at MVTI, but they also revealed that they participated to a somewhat limited extent in such activities. More of the former students seemed to consider the emphasis on student activities as "about right" than did the 1961-62 student group.

In Table 3.9 are shown student and alumni responses regarding the counseling program at MVTI. As one might expect, students' greatest counseling help was received in occupational planning. Responses were relatively evenly divided in the two groups as regards assistance with educational planning and help with personal adjustment.

When the two groups (present and former students) were asked about the importance of counseling services for a school such as MVTI, they responded as shown in Table 3.10. There is no doubt that both groups of MVTI students consider counseling as a very important service.

Construction on the MVTI campus to improve physical facilities and to increase building capacity has been in progress for some time. Authorities at MVTI report that qualified candidates have been denied admission because of restricted facilities for several years. Some growth in enrollment has occurred as indicated in the Table 3.11.

TABLE 3.8

RESPONSES OF PRESENT AND FORMER STUDENTS OF MVTI CONCERNING ACTIVITIES PROGRAMS AT MVTI

Item	Response	Per cent of students	
		Present	Former
Emphasis on student activities	Too Much	0	.9
	About right	68.2	78.3
	Too Little	31.8	20.8
	Total	100.0	100.0
Extent of participation in student activities	Much	12.5	*
	Some	55.7	
	Little or Very little	31.8	
	Total	100.0	

Source: Survey questionnaires.

*This item was not included in the questionnaire to former students.

TABLE 3.9

RESPONSES OF PRESENT AND FORMER STUDENTS OF MVTI CONCERNING THE MVTI COUNSELING PROGRAM

Type of assistance	Per cent of students responding			Per cent of former student responding		
	Much help	Some help	Little or no help	Much help	Some help	Little or no help
Educational planning	11.6	54.7	33.7	23.7	41.2	35.1
Occupational planning	40.7	44.2	15.1	42.4	36.4	21.2
Personnel adjustment	11.8	62.3	25.9	33.1	44.7	22.3

Source: Survey questionnaires.

TABLE 3.10

RESPONSES OF PRESENT AND FORMER STUDENTS OF MVTI CONCERNING THE IMPORTANCE OF COUNSELING

Response	Per cent of students	
	Present	Former
Very important	85.1	71.2
Of some importance	13.8	25.8
Of little importance	1.1	3.0
Total	100.0	100.0

Source: Survey questionnaires.

TABLE 3.11

MVTI ENROLLMENT BY CURRICULUMS, 1957 through 1962

Curriculum	1957	1958	1959	1960	1961	1962*
Automotive Technology	54	57	57	58	57	67
Building Construction	39	37	41	39	41	51
Culinary Arts	0	10	23	38	34	39
Electronics Technology	53	53	51	52	45	52
Industrial Electricity	49	44	50	39	37	37
Machine Tool Technology	47	46	39	44	51	54
Marine Technology	0	0	3	19	33	48
Oil Burner Heating	19	21	22	25	19	12
Total	261	268	286	314	317	360

Source: MVTI records.

*Enrollment for the fall of 1962 was estimated by MVTI.

Three curriculums have fewer students in 1962 than in 1957. Three have a large number. The increase, however, between 1957 and 1962 is reflected primarily in the addition of the two new curriculums: Marine Technology and Culinary Arts.

Faculty

In 1961-62 there were 22 individuals included on the staff at MVTI who had teaching duties. The distribution of the MVTI faculty as regards degrees is shown in Table 3.12. The faculty is 72.7 per cent nondegree people.

The background of experience of the staff is, however, good so far as industrial, primarily trade, experience is concerned. There is a noticeable lack of teacher training among the staff. Instructors in a trade program come logically to the position through the experience-

in-the-occupation route. The majority of the staff in technical institute type programs usually have degrees in their specialties. Supporting instructional personnel in mathematics, science, English, etc. should all have degrees because of the nature of the courses. The faculty work week of instruction appears to vary from a minimum of 30 hours to a maximum of 40 hours.

TABLE 3.12

DISTRIBUTION OF MVTI STAFF BY SUBJECTS TAUGHT AND HIGHEST DEGREE HELD

Subject taught	Highest degree held			
	None	Associate	Bachelor's	Master's
Automobile Technology	2	0	1	0
Building Construction	1	0	0	0
Culinary Arts	2	0	0	0
Drafting	1	0	0	0
Electronics Technology	2	0	0	0
Industrial Electricity	1	0	1	0
Machine Tool Technology	2	0	0	0
Marine Technology	2	0	0	0
Oil Burner Heating	1	0	0	0
Business Management	0	0	1	0
Physics	0	0	1	0
Mathematics	2	0	0	0
English	0	0	1	0
Related Shop	0	0	1	0
Total	16	0	6	0

Source: MVTI records.

While student opinion is not necessarily an objective measure of instruction, it does provide evidence concerning the educational climate of an institution. Responses of present students and alumni to questions in the survey questionnaire about the quality of instruction at MVTI are shown in Table 3.13.

Students and alumni apparently are fairly well satisfied with instruction, having somewhat greater respect for the laboratory and shop instruction than for that in other types of instructional activity.

Instructors when asked, by survey questionnaire, concerning the major strengths and weakness of MVTI's present program, reported that the major strengths were a dedicated faculty and successful graduates and that the major weaknesses were lack of interest on the part of the State Education Department, lack of adequate financial support, an inadequate public relations program, and understaffing.

MVTI Facilities and Equipment

MVTI occupies a multibuilding campus with more than 30 acres of land at former Fort Preble in South Portland, Maine. Buildings are being renovated and rebuilt to provide more adequate facilities for increased enrollments.

TABLE 3.13

RESPONSES OF PRESENT AND FORMER STUDENTS OF MVTI CONCERNING THE ADEQUACY OF INSTRUCTION AT MVTI

Item	Response	Per cent of students	
		Present	Former
Adequacy of instruction in laboratory and shop activities	Very adequate	54.5	64.5
	Fairly adequate	45.5	33.6
	Inadequate	.0	1.9
Adequacy of instruction in technical subjects	Very adequate	31.0	40.0
	Fairly adequate	61.0	47.6
	Inadequate	5.8	12.4
	Varies	1.2	
Quality of instructional staff	Above average	14.6	*
	About average	68.3	
	Below average	13.8	
	Varies	3.3	

Source: Survey questionnaires.

*This item was not included in the questionnaire to former students.

Automotive Technology. This curriculum has a splendid new building with excellent facilities. Up-to-date test equipment is insufficient to provide for the numbers enrolled.

Building Construction. The buildings housing this curriculum have been rebuilt and appear to be satisfactory, provided the reconstruction program continues. Additional equipment is needed, especially in the area of testing.

Culinary Arts. Housing for this curriculum is very inadequate in terms of its purpose. Equipment, especially in refrigeration, modern pressure cooking, and radaranges, is seriously needed if the curriculum is to meet its objectives. There is no apparent cooperation between this curriculum and the mass feeding of MVTI students.

Electrical Technology and Industrial Electricity. Additional space as well as improved quarters are required for these two curriculums. Too many types of work are crowded into too few laboratories. A new and increased supply of switching equipment, power instruments, measuring instruments, testing devices, etc. are essential if the students are to be trained in current electrical procedures.

Machine Tool Technology. Additional space has been provided for expansion of this curriculum but progress is slow in taking advantage of the new addition. Equipment of all types is required if instruction is to keep pace with new developments in the machine trades. Materials testing equipment of all kinds are either nonexistent or in short supply.

Marine Technology. Building space is limited and increased space is required. Additional equipment of all kinds is needed. Supply money is in so limited that the training ship can put out only for short cruises, and no actual fishing has been done thus far. This limits instruction, and the curriculum cannot meet its objectives.

Oil Burner Heating. Housing does not appear to be very adequate. If the curriculum were to be increased to two years as it was once, or if it were to be converted to Instrumentation or a similar curriculum, it should be housed in larger quarters with expanded equipment.

The questionnaire to students and former students of MVTI included questions concerning MVTI equipment and facilities. Responses to these questions are summarized in Table 3.14.

TABLE 3.14

RESPONSES OF STUDENTS AND FORMER STUDENTS OF MVTI CONCERNING THE ADEQUACY OF BUILDINGS AND TOOLS AND EQUIPMENT

Item	Response	Per cent of students	
		Present	Former
Building facilities	Very adequate	3.4	5.5
	Fairly adequate	42.1	50.2
	Inadequate	54.5	41.3
Tools and equipment	Very adequate	26.2	33.4
	Fairly adequate	62.5	52.7
	Inadequate	11.3	13.9

Source: Survey questionnaires.

Former students apparently look with greater favor on the facilities and tools and equipment of MVTI than do the present students. From responses to other items in the survey questionnaire, it is inferred that present students and former students feel that, in general, course materials for student use are fairly adequate, and that students have little dissatisfaction with parking facilities.

Some of the comments, concerning facilities, equipment, and library, made by students and alumni when asked for suggestions concerning the improvement of this type of educational program are:

A good library
Improved building and classroom facilities
Better equipment
Larger budget
More and better equipment
Improved dormitories
More modern machines
Better and newer testing apparatus

Curriculum

Course outlines in all subjects taught at MVTI are not available. Some instructors have excellent course materials; others point to the catalog description as their course outline. English instruction apparently varies as to rigor among curriculums. Drafting is given to students in Automotive Technology and Machine Tool Technology where short courses in blueprint reading and shop sketching usually suffice. Business management is given in Automotive Technology, Building Construction, Electronics Technology, Industrial Electricity, and Machine Tool Technology. In some of these curriculums which emphasize skills, other courses might be substituted which serve the student to a better degree.

Such courses as DC circuits, AC circuits, surveying, and strength of materials are listed under mathematics.

Students are under instruction for a minimum of 35 hours per week, with a 40-week year. This is unusual in post-high school education. Students at this level are ordinarily mature enough to assume more of the responsibility for their own education. By reducing the school work week from 35 hours per week to 30 or less and by proper scheduling, enrollment could be increased at least one-third in the present facilities.

Discussions with instructors brought out the fact that an attempt is being made to teach too much. Carefully constructed course outlines, with proper analysis of the elements to be taught, could reduce the time spent in instruction with little, if any, loss to the student.

Students are usually scheduled for 20 hours per week in shops; out of this, up to seven hours is taken for related instruction, which means that the laboratory or shop could be vacant seven of the 20 hours, leaving 13 hours of actual shop or laboratory use. Three sections could be scheduled in the laboratory or shop during the week, rather than the present two sections. Reducing student time to 30 hours per week or less, with a resulting reduction in shop time, would make this scheduling easier.

Even if credits assigned to specific courses were evaluated in the usual manner, with one credit assigned to classroom and theory for each hour of instruction with home work assignments added, one credit for each two hours of physics and technical laboratory instruction, and one credit for each three hours of shop instruction, the student load would be reduced to reasonable limits, with the opportunity of reducing instructor time accordingly. Evidence of this is shown in Table 3. 15 in which the existing curriculum in Machine Tool Technology is corrected to show proper evaluations.

These corrections and adjustments reduce student time from six to eight hours per week without affecting the credit hours which are the criteria of student expenditure of time and effort. Under this program, the student would be expected to spend considerable time in outside preparation. It would also make possible the admission of another section of students into the curriculum without increasing facilities. In addition, in this curriculum, the time spent in drafting is questionable. Two hours per week for one or two semesters spent in sketching and blueprint reading could satisfy a machinist's needs in this area.

These same alterations could be made in all curriculums unless there is sufficient evidence that the institution can afford the expense of "spoon feeding" students with all the instructor and facility time involved. Institutions in other states have been successful in training students in a considerably shorter work week and also in a shorter year.

Advisory Committees

Advisory committees for individual curriculum have been used to a very limited extent. Minutes of Committee meetings for Culinary Arts, Building Construction, and Oil Burner Heating are on file in the Principal's office. None of these covered recent meetings. Committees for the other curriculums may have been in existence at some time, but they are no longer functional.

Relationships with Employers

Placement at MVTI appears to be handled by instructors within each curriculum, with some help from the Principal's office. No definitive pattern exists for overall placement. Relationships of individual instructors with employers of graduates in his own curriculum appear to be the predominant procedure for placement of graduates.

TABLE 3.15

EXISTING AND SUGGESTED CORRECTED SCHEDULE FOR THE MACHINE TOOL TECHNOLOGY CURRICULUM AT MVTI

Subject	Existing schedule (hours)			Subject	Corrected schedule (hours)		
	Class	Lab.	Credit		Class	Lab.	Credit
1st Semester				1st Semester			
Ma-1	5	0	4	Ma-1	4	0	4
En-1	5	0	4	En-1	4	0	4
Dr-1	1	4	3	Dr-1	1	4	3
Mtt-1	7	13	8	Mtt-1	5	9	8
Total	18	17	19		14	13	19
2nd Semester				2nd Semester			
Ma-2	5	0	4	Ma-2	4	0	4
Sc-1	3	2	4	Sc-1	3	2	4
Dr-2	1	4	3	Dr-2	1	4	3
Mtt-2	7	13	8	Mtt-2	5	9	8
Total	16	19	19		13	15	19
3rd Semester				3rd Semester			
Sc-10	3	2	4	Sc-10	3	2	4
Bus-1	5	0	4	Bus-1	4	0	4
RS-1	0	5	2	RS-1	0	6	2
Mtt-3	7	13	8	Mtt-3	5	9	8
Total	15	20	18		12	17	18
4th Semester				4th Semester			
HR-1	5	0	4	HR-1	4	0	4
Bus-2	5	0	4	Bus-2	4	0	4
RS-2	0	5	2	RS-2	0	6	2
Mtt-4	10	10	8	Mtt-4	5	9	8
Total	20	15	18		13	15	18

Source: MVTI Catalog and Survey Staff calculations.

Supervision

Responsibility for supervision at MVTI rests with the Principal. The fact that the faculty all have the same rank militates against assignment of Acting Heads which appear to exist in some departments.

Little or no supervision in the classroom and laboratory can be expected because of the complete lack of assistance to the Principal, who functions as principal, dean of students, admissions officer, superintendent of grounds and buildings, public relations officer, etc. Figure 3.1 reflects the central and almost sole responsibility of the MVTI Principal for administration.

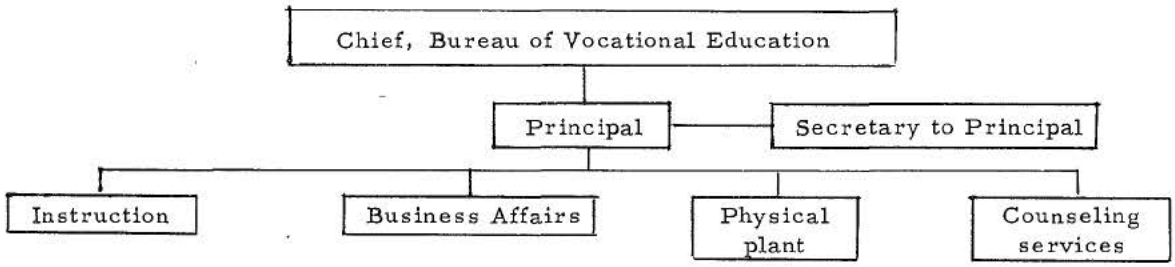

Figure 3. 1. Administrative Organization of Maine Vocational-Technical Institute

Northeastern Maine Vocational Institute

Recent acquisition by the State of Maine of portions of the former Presque Isle Air Base has made possible the establishment of a second post-high school institution in the State. The basic purpose of this school is to serve young people interested in positions in business, industry, and the professions which require training at less than the four-year college level.

The entire Survey Staff toured the school campus and inspected several of the buildings, primarily those to be utilized first as the school is developed. Conferences were held with Mr. Keith Thompson, the principal; architectural drawings of proposed remodeling were looked over; and contacts were made with various industries, business organizations, and schools in Aroostook County and with the Executive Officer of the Chamber of Commerce of Presque Isle.

Control

Northeastern Maine Vocational Institute, like Maine Vocational-Technical Institute, is under the direct control and supervision of the Maine State Board of Education, authorized under Section 203 of Chapter 41 of the Revised Statutes, 1954. The specific language of the authorizing statute was given earlier in this section of the report under a discussion of MVTI.

Location

Northeastern Maine Vocational Institute is located in Presque Isle, one of the largest communities in that part of the State and one of the leading trading centers in Aroostook County. Loring Air Base at Limestone is only a few miles distant. Aroostook County itself is primarily agricultural, with potatoes the leading crop. Serious attempts are being made to induce new industries to locate in Aroostook County, with some success. The population of the County is now over 100,000 and growing. Paper and wood products, together with food processing, are the major industries.

Facilities

Facilities available for use by the school include approximately 60 acres of land with 50 buildings in good repair. A chapel, an auditorium, officers' and non-commissioned officers' clubs, a hospital, feeding centers with some equipment, dormitories with furnishings, service buildings well adapted for shops and laboratories, and various buildings suited for a variety of educational uses are at the disposal of the school. One building which has had little if any use is completely wired for electronic data processing. Almost all of the buildings have individual oil heating units, making them suitable for year-around use.

Some remodeling has been done, and facilities are ready for the first curriculum to be opened at the school in 1962, Practical Nursing. This will be the only curriculum in operation at the school in 1962-63.

Architectural drawings have been made for major remodeling of several of the buildings.

Equipment

With the exception of some items for Practical Nursing and some office equipment, little or no equipment of a major nature is on hand, and specifications for equipment that will be needed in the several proposed curriculum have not been written, nor have such equipment items been listed. Cafeteria and dormitory equipment and furnishings in some quantity are on hand.

Curriculums

As mentioned previously, Practical Nursing is the only curriculum that will be in operation during 1962-63. Automechanics, Building Trades, Business, and Cosmetology have been proposed as additional curriculum offerings. Nothing has been done in the way of developing course outlines, book lists, equipment lists, etc. for these curriculums; nor has a catalog, descriptive brochures, or other publicity materials been prepared.

Staff

A Principal, a Director of Practical Nursing, a small office staff, and a maintenance staff have been appointed and are on the job. Except for Practical Nursing, no instructional staff has been appointed.

Advisory Boards and Committees

A 28-member Advisory Board was appointed very recently to furnish counsel and advise concerning the overall operation of the school. There are no curriculum advisory boards or committees.

Community Opinion

All of those contacted by the Survey Staff felt that the school would be successful in filling a felt need. They were also of the opinion that Aroostook County had great potential for industrial growth, and that the school would be a great asset in effecting this growth. The City of Presque Isle has secured a portion of the Presque Isle Air Base and is developing it as an industrial park. Two new industries have already been secured as tenants; one of these is of considerable size.

SECTION 4

MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This section of the report serves a summarizing purpose for the sections which preceded it. It is the Survey Staff's distillation of the material presented in greater detail in the earlier sections. The recommendations which conclude the section and the entire report are the guidelines proposed by the Survey Staff for improving the program of vocational-technical education in Maine, which has already taken many forward steps in this important phase of public education.

In introducing this section, the Survey Staff wishes to point out to the reader, in a kind of "warning" way, that many of the findings and conclusions will have a rather negative flavor. They will point out lacks, weaknesses, omissions, failures as they appear to the outside survey group. The reader may subconsciously find himself developing a sense of resentment toward this. The Survey Staff wishes to emphasize, however, that a school survey was authorized, first of all, because the educational leaders of Maine were aware of certain existing or potential problems. The purpose of the survey group, like that of the doctor, was to examine, interpret, diagnose, and prescribe. This it has attempted to do - carefully, objectively, and helpfully.

Major Findings and Conclusions

The following statements represent the findings of the survey staff as a result of visitation, observation, and discussion involving the present situation and future needs of Vocational Technical Education in the State.

High School Vocational Education

1. School administrators in Maine are basically realistic in their opinions of the per cent of students (20-30 per cent) who enroll in 4-year college programs following graduation.

2. The majority of school principals and superintendents contacted felt the State should provide and support "education for earning a living" - not the local school districts.

3. Local school administrative personnel do not seem to understand quality vocational education, nor do they appear to support very well the existing programs.

4. The State and local philosophy of secondary education in Maine is still predicated largely on the academy system, or academic education for all.

5. The evidence is rather overwhelming that Maine secondary schools are not willing to initiate or support quality vocational offerings for the noncollege bound youth regardless of their ability level.

6. For the most part, it appears that only students of substandard scholastic ability are permitted to enroll in vocational education programs, particularly in trade and industrial courses.

7. Very few public school personnel, from teachers to superintendents, seem to understand the purpose and nature of the Maine Vocational-Technical Institute.

8. Organized preservice and inservice teacher education for vocational teachers, particularly for trade and technical teachers, in curriculum development and improved teaching techniques is conspicuous by its almost complete absence.

9. The almost complete absence of qualified local personnel with adequate time to permit functional supervision of approved trade and industrial programs is adversely affecting these programs.

10. Vocational teachers are not only in need of supervisory and teacher education service but are outspoken concerning their desire to improve their teaching if such professional help were available.

11. Facilities for trade and industrial education, including housing, equipment, and supply budgets, exhibit strong evidence that in only a very limited number of schools have adequate efforts been made to support a quality program.

12. The absence of functional representative advisory committees at the local level is a deterrent to the quality of local trade and industrial programs.

13. The dropout rate of Maine pupils in grades 8 and 9 (reported to be 40 per cent) is strong evidence that Maine's high schools are not providing a variety of programs to serve the needs and interests of a large segment of her youth.

14. Although business education courses can well lead to profitable employment for high school graduates, only in a few localities were employers satisfied with the skill and knowledge such graduates brought with them to employment.

15. The paucity of broad, exploratory, general education industrial arts programs in Maine's high schools handicaps many students from making wise vocational choices while in high school.

16. There are in Maine some examples of quality facilities, equipment, and instructional programs in industrial arts and vocational trade and industrial education. Even in these programs however, it was reported that students of average or above achievement level could not enroll, usually because of academic requirements.

17. Almost all school administrators are strongly favorable to public post-high school vocational-technical schools.

18. School personnel disagree in their reactions to area vocational education centers being administered through local school districts.

19. Extension, or supplementary, vocational programs for employed workers are extremely limited in number.

20. Practical nurse and fire department training programs are administered directly by the State Department of Education, and not through local public school authorities as is the usual practice.

21. All school administrators contacted agreed that quality vocational trade and technical education can be made available only on an area or regional basis.

22. Trade and industrial teachers in most Maine schools appear to be skilled in their occupations but show evidence of need for instruction in methods and techniques of teaching and curriculum development.

23. Only about 60 per cent of all students enrolled in high school trade and industrial skilled trade classes are receiving related technical instruction.

24. Most related technical instruction being provided for trade and industrial students is general in nature in that students from more than one occupational area attend the same class.

25. The promotional development of distributive education has been neglected in Maine.

26. The program of vocational home economics is failing to reach a large per cent of high school girls, particularly those who may be college bound.

27. Vocational agriculture programs seem to be of good quality but appear to be enrolling many boys who are not planning to enter agricultural occupations after graduation.

28. Maine high schools have not made very frequent use of part-time cooperative education as an effective and economical way of providing vocational preparation for high school students.

29. Only seven skilled occupations are offered in Maine's high school trade and industrial education program, exclusive of part-time cooperative: two (Building and Machines Trades) are offered in eight centers; one (Automechanics) in four schools; three (Electrical, Sheet Metal, and Cabinet Making) in two communities and Printing in only one.

30. Maine high schools located in the 24 cities having a population of 5,000 or more are serving only about one-fifth of the minimum number of potential students in trade and industrial vocational programs.

31. No local trade and industrial program was found to have effective selection procedures for enrolling students. Not one school was found to be using the State Employment Service test battery in vocational student selection.

32. Only in isolated cases is any effort made toward effective job placement and follow up of vocational graduates.

33. The title "occupational" frequently given to industrial arts courses in Maine is inconsistent with the generally accepted national definition of such courses and no doubt contributes to confusion on the part of educators, students, parents, and employers.

34. Many industrial employers must go out of State for trained skilled and technical manpower.

35. Maine industry as a group is searching for sources of upgrading instruction for employees at all levels--skilled tradesmen, technicians, supervisors, and engineers.

36. Local public schools in most communities do not provide educational assistance to industry.

37. Almost no effort is made by the secondary schools of Maine to bring industrial and business leaders into a cooperative relationship with the schools and to seek their advice and counsel about the skills and knowledge required of high school students who enter the labor market immediately upon graduation.

38. Every industrial person interviewed by the Survey Staff stated that Maine had plenty of manpower potential, but that it must be made occupationally competent through vocational and technical training before it can become an asset to employers or to the State.

39. Not one employer contacted by the Survey Staff expressed a feeling that the local public school system could be expected to change its educational philosophy sufficently to permit quality programs of vocational trade and industrial education to be operated.

40. Organized labor leaders feel strongly that quality vocational education, leading to occupational competence, can be provided only at the post-high school level since the prevailing secondary school philosophy does not support quality vocational education.

Maine Vocational-Technical Institute

1. Faculty, alumni, and students are conscious of the need for improvements in buildings, for updating and adding to the instructional equipment now available, and for increased financial support to the institution.

2. Location of the school may not be a deterrent to student attendance since about three-fifths come from outside Cumberland County and only about one-seventh say they enroll because of the location of the school.

3. Of those who commute to school, about three-fourths come by automobile, and almost two-fifths travel more than 11 miles.

4. Only a few of the students at MVTI had vocational courses in high school.

5. The largest single factor which influenced the students and alumni in their decision to attend MVTI was the nature of the training available there.

6. The desire to prepare for the vocation for which the curriculum trained was the largest single factor which influenced the decision of students and alumni in the selection of curriculum.

7. Students and alumni of MVTI are well satisfied with their selection of curriculums.

8. Evidence of alumni and student satisfaction with their training at MVTI is that almost 94 per cent of the alumni and about 77 per cent of the present students would recommend MVTI to relatives and friends.

9. About two-thirds of the present students and three-fourths of the alumni feel that the activities program at MVTI is about right, and about two-thirds of present students participate in it.

10. Both present students and alumni recognize the importance of a counseling program, and opinion is divided concerning the adequacy of the present MVTI program.

11. Enrollment at MVTI is gradually increasing, but the major increase is the result of the addition of Culinary Arts in 1958 and Marine Technology in 1959.

12. Graduates of MVTI generally find employment in the occupational fields in which they are trained.

13. The instructional staff has good on-the-job experience as preparation for teaching but indicate a lack of formal teacher training as well as college and university training usually found among the instructional staff of an institution of this kind. MVTI has no system of faculty rank.

14. Students and alumni are fairly well satisfied with instruction but evidence some dissatisfaction with certain subject matter areas and with specific members of the instructional staff.

15. Placement service at MVTI is not coordinated but is left generally to the departmental staffs.

16. Central library facilities are non-existent. Small curriculum libraries are available within departments; and an extremely meager reference library, primarily dictionaries and encyclopedias, is located in the dormitory. Students, alumni, and faculty alike emphasize the need for adequate library service.

17. MVTI subscribes to about 30 technical periodicals.

18. Well-organized and up-to-date course outlines are lacking in the majority of the departments and subject matter areas.

19. Supporting evidence for the inclusion of subjects within a curriculum are lacking; e. g., drafting in Machine Tool Technology and Automotive Technology.

20. The instructional staff is energetic, hardworking, dedicated to teaching, but lacks knowledge in pinpointing what the student should be taught in an educational institution and what he should be taught on the job.

21. The instructional staff is scheduled for from 30 to 40 hours of teaching per week, and a number of them teach several different courses.

22. Students' schedules call for from 35 to 40 hours per week of instruction for 40 weeks per year except for those in Culinary Arts and Marine Technology who are excused two weeks early so that they can seek summer jobs.

23. Advisory committees have been appointed, but few meetings have been held. The most recent minutes on file were those of a 1959 meeting of the Culinary Arts Committee.

24. The present allocation of student time and scheduling is preventing additional students from being accepted in present facilities.

25. Supervision is at a minimum because of the load of other duties place upon the MVTI principal.

26. Supervision by State authorities is at a minimum because of the heavy load of work placed upon the Chief of the Bureau of Vocational Education.

27. The admissions program screens students and provides a potentially competent student body, with a fair spread among the students in regard to high school rank.

28. Many qualified students are denied admission because of apparent lack of instructional space and staff.

29. Electronics Technology and Industrial Electricity curriculums can be termed technical and engineering related, and there is a considerable portion of the first year's work which is common to both curriculums.

30. Marine Technology is technical in nature but does not appear to be engineering related.

31. All other curriculums are skilled trade in objectives but offer training over and above that which is usually found at this level.

32. The majority of the instructional staff see little or no difficulty in operating trade and technical courses on the same campus.

33. There is some sentiment among faculty, students, alumni, and administration favoring accreditation and the awarding of the Associate degree.

34. MVTI graduates are well received by industry, and employers are enthusiastic in their praise for these graduates.

35. Some employers suggested that mathematics be upgraded in the Electrical curriculum.

36. The Associate degree, according to some employers, would benefit MVTI graduates materially in terms of salary grade levels.

37. No girls are enrolled at MVTI.

38. No adult education classes are held at MVTI except a few classes for apprentices and journeymen sponsored either by the Portland Schools, unions, or employers.

39. There is a serious lack of visual aid equipment in all instructional areas at MVTI.

40. The MVTI Principal has developed a plan to provide opportunities for improvement of instruction through released time when the school is not in session and through encouraging the staff to take advantage of fellowships, etc. Three MVTI instructors held National Science Foundation Fellowships during the summer of 1962.

41. Some of the curriculums could well be organized at two levels: trade and technical.

Northeastern Maine Vocational Institute

1. The facility has excellent possibilities for development as a post-high school institution, with adequate space for classrooms, laboratories, cafeteria and student center, library, dormitories, auditorium, student and faculty lounges, offices, and other auxiliary services.

2. Plans have been made for housing the Practical Nursing curriculum beginning in the fall of 1962.

3. Plans have been drawn for converting some of the buildings into shops, laboratories, and classrooms to house Automechanics, Building Trades, Business curriculums, Cosmetology, etc.

4. NMVI plans to offer Automechanics, Building Trades, Farm Equipment and Machinery Service, Practical Nursing, Business, and Cosmetology.

5. An Advisory Council has been appointed recently to assist in the development and operation of the school.

6. A Principal has been hired and has been on the job for some time, but he needs much help in making the institution a going concern.

7. Money has been available for some reconstruction and for maintenance of the property.

8. The residents of Aroostook County are enthusiastic about the potential of the school.

9. No publicity material has been printed for distribution to prospective students or to business, industry, and the general public.

10. Nothing has been done in the development of course material for the proposed curriculums.

Recommendations of the Survey Staff

On the basis of the major findings and conclusions presented in the foregoing pages of Section 4 and the material in Sections 1, 2, and 3 from which these findings and generalizations were derived, the Survey Staff presents its recommendations. First, there is a series of four brief recommendations comprising the Master Plan for Vocational-Technical Education in Maine. This Plan, then, is elaborated in two series of recommendations: one series dealing with post-high school vocational-technical education; the other, with the vocational education program at the high school level.

The Master Plan

In consideration of the economic, geographic, and social nature of the State of Maine as well as the educational philosophy of public school personnel, and in view of the progress that has already been made and the needs that still exist for quality skilled and technical occupational training in the State, IT IS RECOMMENDED:

1. That to serve the skilled and technical manpower needs of the State and of its people, four two-year post-high school institutions to be designated as TECHNICAL EDUCATION CENTERS[1] be planned, developed, and placed into operation as soon as economically feasible; and that these centers offer appropriate two-year programs in agriculture, home economics, and business and distributive areas in addition to a wide variety of skilled trade and technical curriculum for industry.

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[1]Including the two Centers already authorized (MVTI at South Portland and NMVI at Presque Isle).

2. That to support the programs of these Technical Education Centers, the high schools of the State improve and expand their vocational education offerings in agriculture, home economics, distributive education, and trade and industrial education; but that the trade and industrial education be limited to semiskilled, service, and operator types of occupations and for those students for whom high school is likely to be their last direct contact with formal education.

3. That the Technical Education Centers be responsible for the promotion, organization, and implementation of all educational programs of an extension nature for adult workers and supervisors in industry, agriculture, business, distribution, and home-making areas.

4. That in considering the Master Plan and its implementation, educational leaders in Maine view the occupational spectrum in terms of manipulative skills and technical knowledge as shown in Figure 4. 1, and that those responsible for planning and development recognize the major functions and basic relationships of the TEC's and the high schools as indicated in Figure 4. 2 with respect to vocational-technical education.

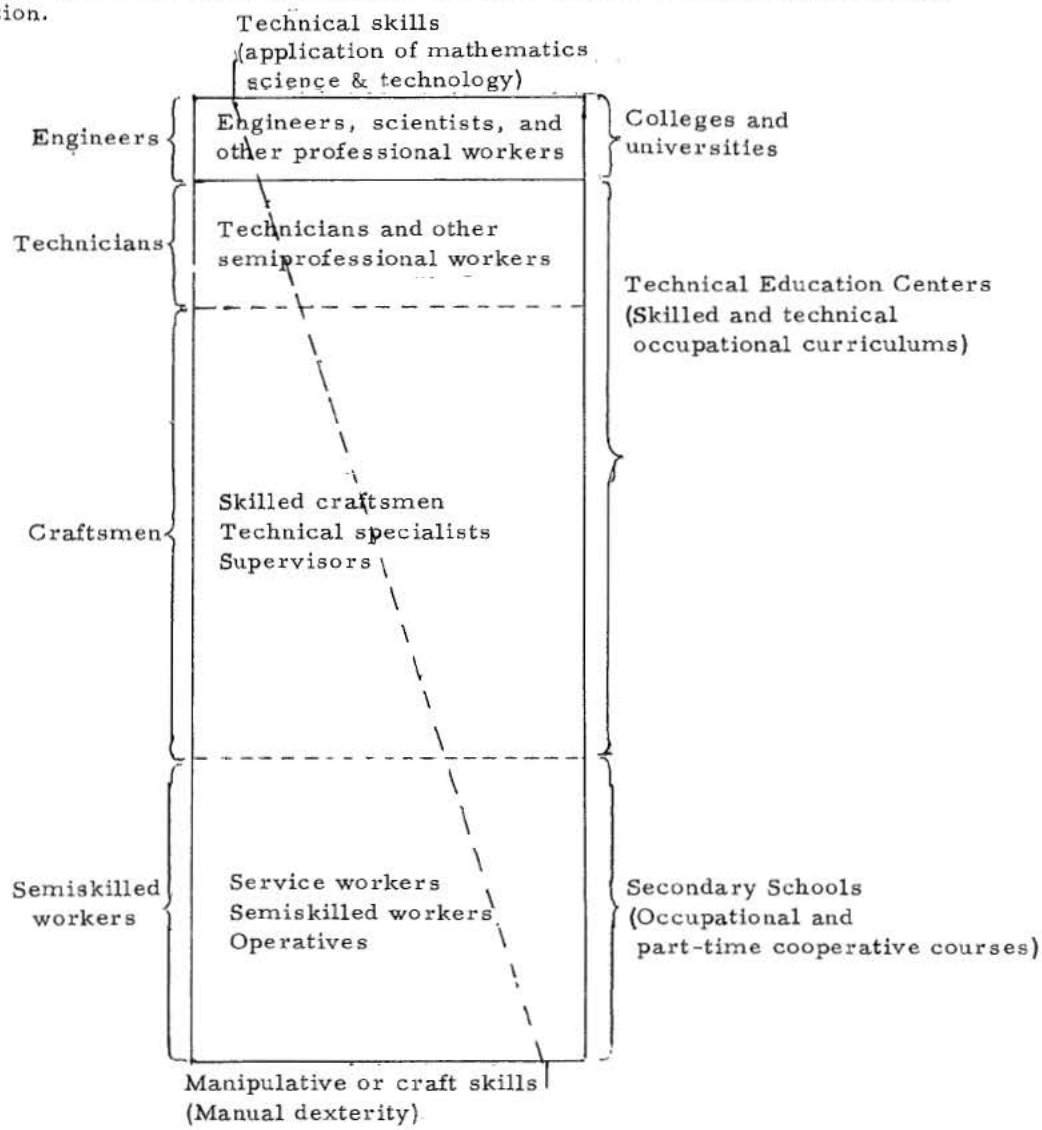

Fig. 4. 1. Types of Skilled Workers and Recommended Educational Programs for preparing them in Maine

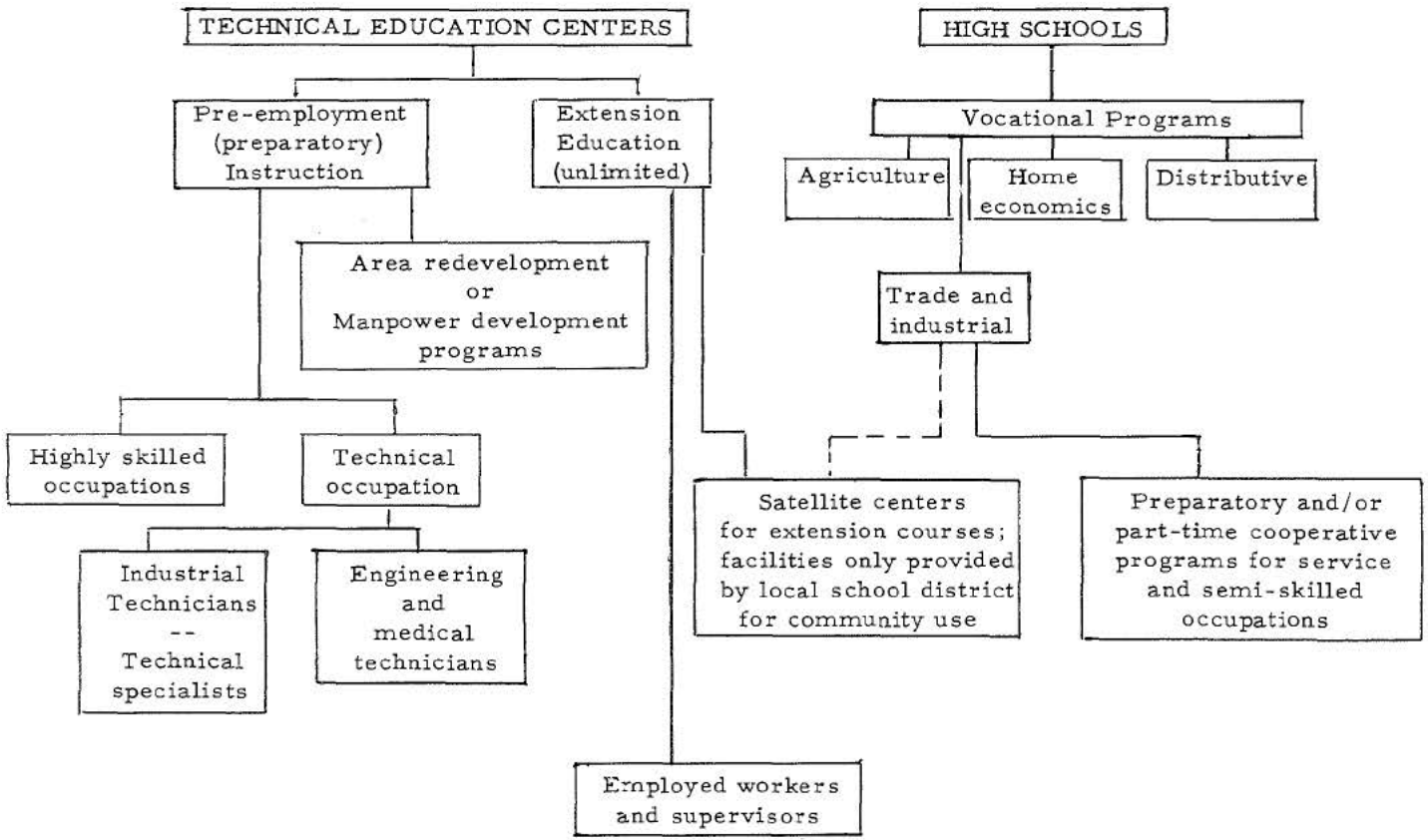

Fig. 4. 2. Functions and Their Relationships in The Recommended Master Plan for Vocational-Technical Education in Maine

Post-High School Vocational-Technical Education (General)

In order to implement the major components of the Master Plan as regards post-high vocational-technical education in Maine, IT IS RECEOMMENDED:

1. That immediate steps be taken to extend Technical Education Center #1[2] (MVTI) to serve at least 750 to 1,000 students; that the Center serve basically the southern section of the State from Brunswick south to the State line, an area having a population of approximately 300,000 people, with "satellite" extension centers as the need develops in a number of towns and cities such as Bath, Biddeford, Brunswick, Sandford, and Westbrook (see Figure 4. 3); and that the Center take the steps indicated in later special recommendations related to MVTI to expand its enrollment and to improve its program.

2. That existing plans for Technical Education Center #2 (NMVI at Presque Isle) be implemented as soon as possible to serve an enrollment of at least 750 to 1,000 students; that this Center serve the basic area from Fort Kent to Houlton, an area having a population of almost 100,000 with possible "satellite" extension centers as the need for such programs develops in communities such as Caribou, Fort Kent, Houlton, Madawaska, and Van Buren (see Figure 4. 3); that the Center offer initially, as planned, practical nursing, office occupations (business), automechanics, auto body and fender, and general building trades; that, as soon as possible, beauty culture (cosmetology) and electronic data processing be considered as program additions; and that at an early date a second entrance to the campus be provided for the convenience of persons living in the direction of Caribou, Madawaska, and Fort Kent.

3. That immediate preliminary plans, including any needed legislation, be started toward the authorization and development of two additional Technical Education Centers to serve eventually 750 to 1,000 students each.

4. That TEC #3 be located near the Augusta exit of Interstate Route 95 so as to serve best an area encompassing over 250,000 population and including such towns and cities as Augusta, Gardiner, Lewiston, Rumford, Skowhegan, and Waterville, with "satellite" extension centers as needs for such programs develop in the population centers of the area (see Figure 4. 3).

5. That TEC #4 be located slightly south of Bangor to serve an area of about 200,000 population, including the towns and cities of Bangor, Belfast, Brewer, Bucksport, Ellsworth, Machias, and Newport, with "satellite" extension centers as needs for such programs develop in the population centers of the area (see Figure 4. 3).

General Policies Related to the Technical Education Centers

In order to provide a general and basic pattern of policy for the four TEC's, IT IS RECOMMENDED:

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[2]The numbers used in these recommendations to refer to the Technical Education Centers are only to indicate the order of their establishment or proposed establishment. It is proposed by the Survey Staff that names for the various centers be chosen on the basis of something other than points of the compass and that their being named after the particular place of location be discouraged since they are to serve an area or region.

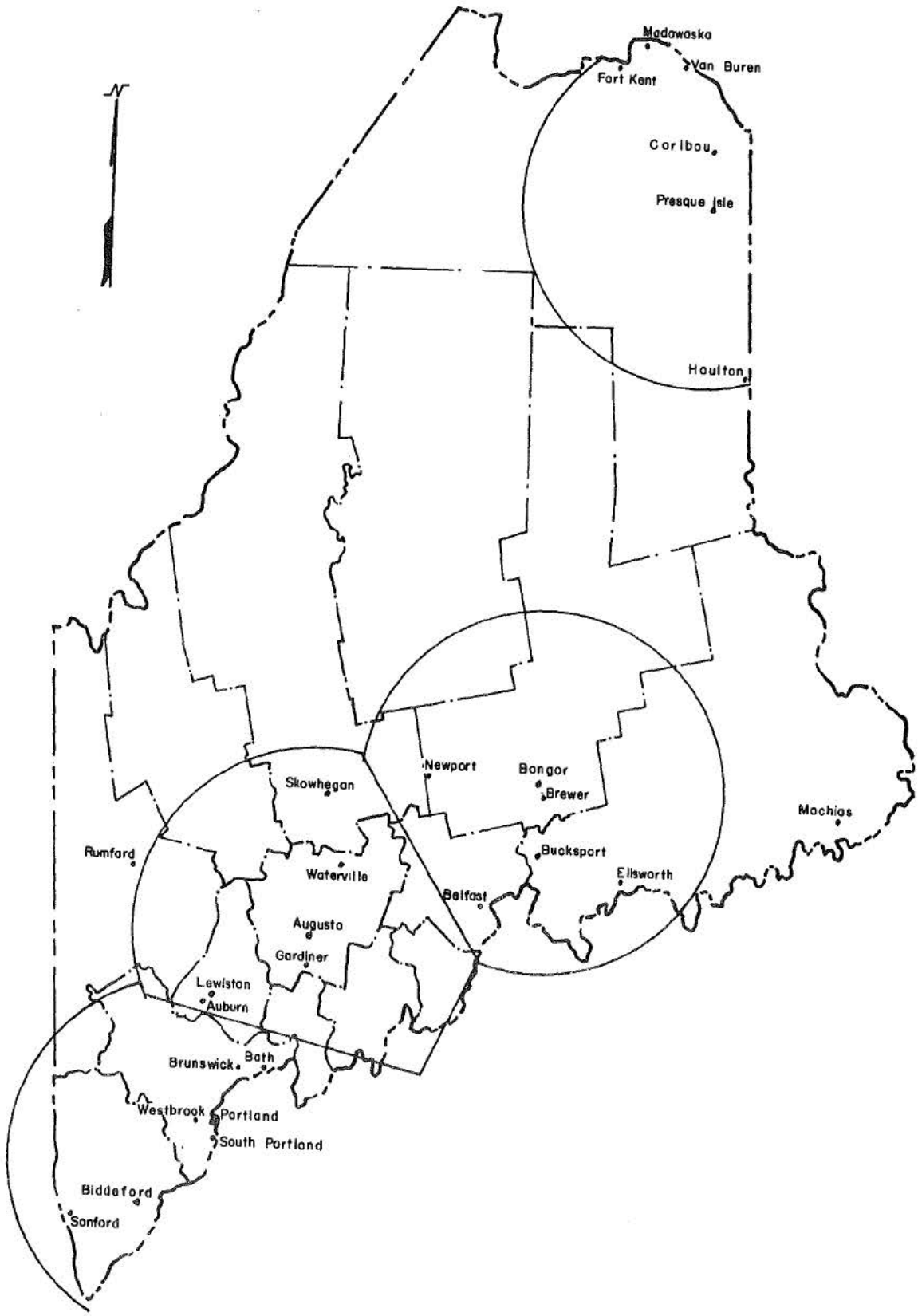

Fig. 4.3. Locations and Basic Service Areas of Four Technical Education Centers

1. That although each of the four TEC's is assigned a geographic area of major responsibility, each school be expected and permitted to accept enrollment from the entire State in those curriculums unique to the given school; e. g. , Culinary Arts at MVTI or Business at NMVI (Presque Isle).

2. That in plans for administering all Technical Education Centers, procedures be set up whereby under certain conditions and with appropriate administration procedures and controls, designated high school pupils (boys and girls) who are 16 years of age or older) be considered for possible reassignment to a Technical Educational Center for vocational preparation if the student meets the entrance requirements of the curriculum he desires.

3. That in each TEC a qualified professionally trained person be provided the necessary time to work with the teaching staff on curriculum planning, teaching methods, and use of instructional aids.

4. That for each TEC a representative Advisory Council from the area served be formed to advise and counsel the Center regarding nature of offerings, adjustments in curriculums, standards for student achievement, advisers to particular courses, sources of competent staff, public relations activities, placement of graduates, and related items.

5. That plans be made and implemented for awarding the Associate degree for those two-year programs of technical education in the TEC's which require the equivalent of at least 20 semester hours of general education in addition to the technical courses, and that in all other TEC curriculums appropriate certificates be issued to graduates.

6. That each TEC be held responsible for all two-year post-high school education and all adult vocational classes in its basic geographic area and be considered the administrative unit to provide such instruction and that such instruction include agriculture, home economic, distributive education, and trade and industrial education (including practical nursing, fire training, and supervisory development programs for industry).

Special Needs of the Maine Vocational-Technical Institute

The Survey Staff has already made in this report recommendations of a rather general nature concerning MVTI as a basic component of Maine's plans for improving post-high school vocational-technical education. With regard to a more specific approach to improving MVTI, IT IS RECOMMENDED:

1. That an Advisory Council, similar to that recently appointed for the Northeastern Maine Vocational Institute, be appointed for Maine Vocational-Technical Institute; that the Council be formally organized with officers, by-laws, regular meeting dates, terms of appointment, etc.; that at least the following committees be appointed within the Council: Budget and Finance, Curriculum, Buildings and Grounds, Personnel Services, and Public Relations and Placement; that regular attendance be expected of the members, and that members who show lack of interest be replaced; and that arrangements be made to pay the expenses of members for attending meetings.

2. That Advisory Committees be appointed for each curriculum; that these committees be composed of representatives of industry, labor, and business (including employers of graduates); that appointments be made by the Chief of the Bureau of Vocational Education on the basis of recommendations made by the administrative and

instructional staff of the Institute; that these Committees meet at least twice each year; that the functions of these committees be to advise the staff concerning training needs, to assist in determining course content and allocating time to individual courses, to make recommendations concerning facilities and equipment, to assist in making known to the public the services provided by the Institute, and to assist in the placement of graduates; and that committee members who do not attend meetings regularly be replaced.

3. That serious consideration be given at once to the reduction of the student work week to not more than 30 hours in the interest of improving the educational program by placing greater responsibility upon the student for his own training, reducing the teaching load of the instructional staff to bring it more into line with that of other post-high school institutions within the State, making it possible to increase enrollment within the present facilities, and making more effective use of laboratories and shops by using them longer hours, provided enrollment is increased.

4. That steps be taken as soon as possible to provide an adequate library facility that will contain a substantial, varied, and carefully selected assortment of textbooks, reference books, and materials pertinent to each curriculum and subject matter area as well as such other books and materials as should be contained in an adequate professional library; provide subscriptions to a variety of periodicals and publications and in sufficient numbers to meet curriculum requirements (100 to 150 different magazines and periodicals); provide study areas adequate in space and conducive to good study habits; and be served by a competent professional library staff sufficient in number to provide professional library service and to keep the library open during day and evening hours throughout the week.

5. That the chief executive of MVTI be designated as Director rather than as Principal; and that additional supervisory personnel be supplied to MVTI: a Dean of Students as soon as possible, other personnel as enrollment increases, and especially a supervisor of adult and extension education.

6. That consideration be given to the establishment of academic rank, [3] with differences in salary between ranks, in the interest of designating curriculum heads with responsibility for effective operation, subject area heads with responsibility for related and general subjects, and with provisions for encouraging self-improvement through merit raises based upon excellence of instruction and/or earned degrees.

7. That the organization as shown in Figure 4. 4 serve as guidelines in improving the organization of MVTI and other Technical Education Centers as parts of the State's Master Plan for vocational-technical education.

8. That the curriculum title, Industrial Electricity, be changed to Electrical Technology as more truly descriptive of its level of content; and that, under the new name, applications be made for Title VIII funds.

9. That the new Electrical Technology (Industrial Electricity) curriculum be combined with Electronics Technology, having the first year in common and with options of specialization in the second year. [4]

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[3] As an example: department Head, senior instructor, instructor, junior instructor, technical assistant.

[4] The new curriculum would be Electrical Technology, with second year option in Power or Electronics. Combining the two curriculums, with common courses during the first year, would make for more flexibility in scheduling and should not interfere with the quality of the program.

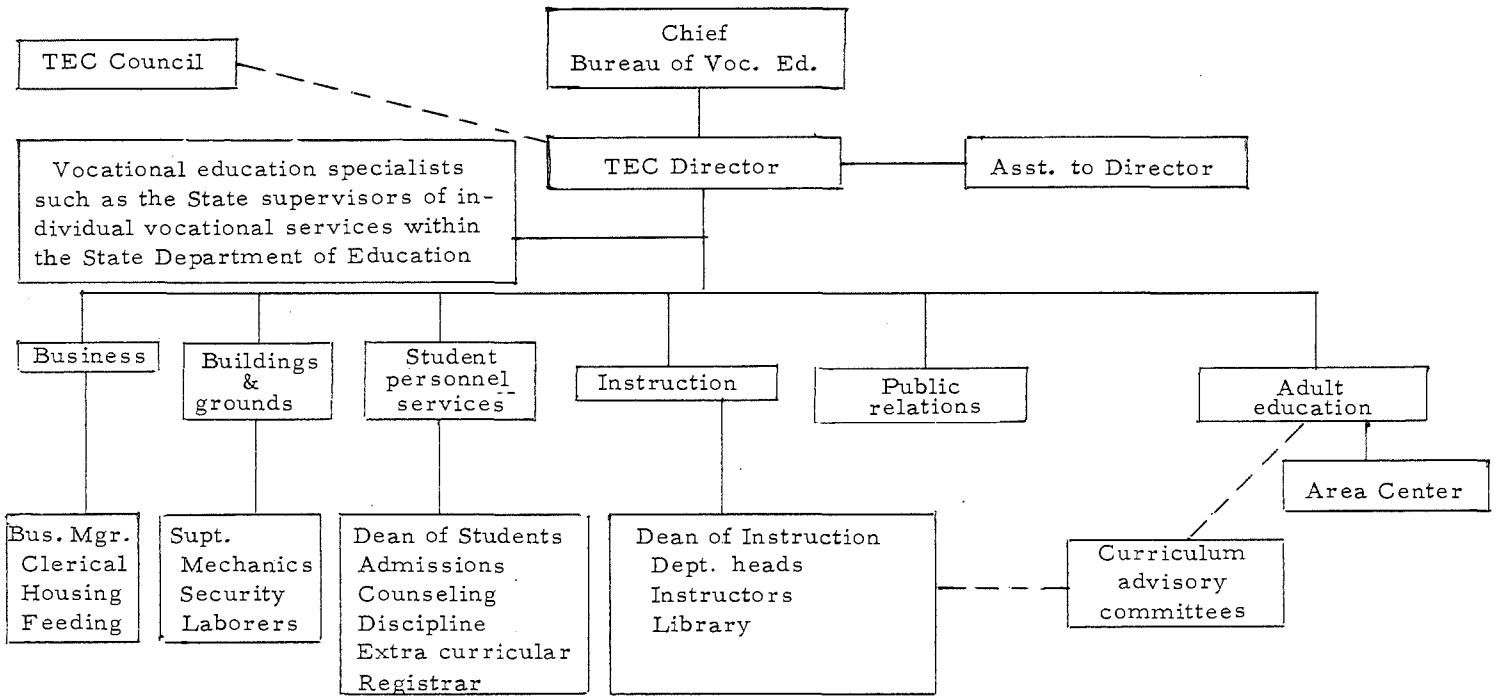

Fig. 4.4. Suggested Organization for Vocational-Technical Education As It Relates to MVTI and other Technical Education Centers in Maine

10. That a two-track curriculum system[5] be adopted whenever and wherever feasible as registration warrants, with trade and technical curriculums being operated in the same occupational area as follows:

    Automotive Technology (Trade)
    Building Construction (Trade) - Construction Technology (Technical)
    Electricity (Trade) - Electrical Technology with Options, Technical
    Machine Tool Technology (Trade) - Mechanical Technology, Technical
    - Marine Technology, Technical
    Oil Burner Heating (Trade) - Instrumentation (Technical)

11. That, with the assistance of curriculum advisory committees, up-to-date course outlines[6] be prepared, concerning course content and subjects to be taught, with the time to be allotted to each; and that proper course titles be assigned to each course; e. g., mathematics should be described as mathematics; strength of materials as strength of materials, etc.

12. That the MVTI catalog be improved to the point where it describes more effectively the services provided by the Institute.

13. That consideration be given in the near future to the establishment at MVTI of a strength of materials laboratory, with adequate equipment to support all curriculums.

14. That a study be made in the interest of utilizing the feeding services at the Institute for practical on-the-job training for the students in the Culinary Arts curriculum.

15. That consideration be given to offering the following curriculums for whose graduates Maine industries should have urgent need: Chemical Technology (with emphasis on paper, leather, etc.), Printing (Newspaper and publishing industries), Industrial Technology (Quality Control, Time and Motion Study, Manufacturing Processes), Construction Technology (Highway Construction, Structural Design, Architectural Drafting, Estimating, Surveying), Mechanical Technology (Tool and Die Design, Machine Design, Production Processes), Instrumentation (All manufacturing industries), and Radio and T-V Service and Repair.

16. That for a potential capacity of from 750 to 1,000 students, as recommended earlier for MVTI, needed additional building space and reconstruction of present structures be provided.

17. That any request of MVTI for accreditation by ECPD be deferred until library facilities are available, course outlines are brought up to date and are complete, and some of the growing pains have subsided.

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[5] In a system of this kind provisions can be made for transfer between the two levels in terms of interest and ability of students. In addition, it would make possible the acceptance of more of the students who apply. Since they are high school graduates, most of them should be acceptable in one of the two tracks.

[6] Sample course outlines may be secured from sources supplied by the Office of Education or from institutions having similar courses.

18. That the same kind of approach be made to MVTI for State accreditation as is made to other State accredited institutions in Maine.

19. That everything possible be done to maintain the high morale, the dedication to teaching, and the interest in students and their success so evident now among administration and instructional staff at the Institute.

20. That an adult education program be developed at the Institute to serve out-of-school youth and employed adults, and that special attention be given to cooperation with industry in the development of special programs for employees.

21. That girls be encouraged to enroll although the campus is not very well suited to accommodate both boys and girls.

22. That although the new practical nurse program in the Portland area is not being operated on the MVTI campus, it be administered as a part of the MVTI educational program.

Special Needs of the Northeastern Maine Vocational Institute

As in the case of MVTI, the Survey Staff early in its recommendations made rather general proposals regarding the school just being started at Presque Isle in order to establish its relationship in the total plan for post-high school education in the vocational and technical fields. In order to provide for the more specific needs of NMVI, IT IS RECOMMENDED:

1. That expert advice be secured before reconstruction of the Presque Isle facility is started in the interest of not "over-stocking" the facility with one or two classrooms for every shop and laboratory when they will be used only a fraction of the school day and also in the interest of flexibility, with different sized classrooms for different purposes - some provided with visual aids and lightproof shades and others large enough to hold more than one class. [7]

2. That, since a library is essential to an institution of this kind and since there are several areas which are spacious, attractive, and admirably suited to this purpose, the library area be selected immediately and plans be made for equipping and stocking it concurrently with the opening of the institution for boarding students.

3. That since business has been selected as one of the offerings at NMTI, specialties within the field be considered, such as medical secretary, which could share the use of the clinical facilities used by the Practical Nursing curriculum, and legal secretary; that the assistance of the State Medical Association and the State Bar Association be sought in determining the need for such specialties; and that the need in the State for electronic data processing be assessed, with the possibility of including training for this work in the program of NMVI.

4. That consideration be given to the establishment at NMTI of a Food Service Administration course, integrated with the feeding services of the institution, and

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[7] If partitioning for classrooms were held to a minimum, additional partitions and other interior remodeling, as experience in use dictated the need, could be 'live' work for the Building Trade students. The instructors in Automechanics and in Building Trades at MVTI could give advice, but even at MVTI classrooms are attached to each shop, with resulting fractional use.

that this curriculum be considered different from Culinary Arts in that it trains supervisors and managers, not cooks and bakers, and in other states appeals to young women who, through the training, become assistant dietitians in hospitals and school cafeteria managers.

5. That curriculums, such as Dental Assisting and/or Dental Hygiene which offer services to the dental profession be considered if and when a survey of need mandates their inclusion, and that the assistance of the State Dental Association be sought in determining need.

6. That a careful survey of the need for a curriculum in Agriculture at NMVI be made.

7. That special consideration be given to the establishment of curriculums that will attract girls since this institution is better equipped for coeducational housing than at MVTI.

8. That the Principal of NMVI be provided with an Assistant, experienced in the development of vocational education, to help with publicity, development of course materials, catalogs, selection of staff, etc.

9. That course outlines be requested from institutions offering similar courses, from the U. S. Office Education, etc. so that valuable source material will be available when course outlines are developed.

10. That curriculum Advisory Committees similar to those recommended earlier in this report for MVTI be appointed to assist in the same manner as recommended for that Center.

11. That a system of faculty rank be provided. (See Recommendation 6, page 72 for Maine Vocational Technical Institute.)

12. That serious study be given to scheduling to provide effective use of the physical facilities at NMVI.

13. That the student work week not exceed 30 hours, and that the student be expected to do a considerable amount of home assignments.

14. That the Advisory Council recently appointed be organized in the same manner as that recommended earlier in this report for MVTI.

High School Vocational Education

The recommendations to this point in Section 4 have dealt primarily with post-high school vocational-technical education, which was the major critical problem for which the assistance of SCHOOL SURVEY SERVICE was sought. There is, however, an important relationship between the vocational programs of the high schools and the vocational-technical programs of the Technical Education Centers recommended earlier in this report, for these two types of programs should serve a complementary and supporting, rather than a competitive, function.

The Survey Staff's recommendations for high school vocational education are made in the light of the observed effort , experience, and educational philosophy which characterize public secondary education in Maine. For the programs of vocational education in the high schools of Maine, therefore, IT IS RECOMMENDED:

1. That the high schools of Maine make no effort to provide the necessary quality vocational education for the highly skilled trade, industrial, and technical occupations such as machinist, printer, automechanic, sheet metal worker, draftsman, or technician of any type.

2. That the home economics vocational education programs in the high schools be continued and strengthened to the end that a much larger per cent of girls may graduate with a maximum of homemaking skills and knowledge and understanding of home and family living.

3. That high schools establish or continue and strengthen their vocational agriculture in schools having an adequate number of farm boys who desire to prepare for agricultural pursuits.

4. That schools now attempting to operate trade and industrial education programs continue to operate such programs wherever housing, equipment, and instructional supplies budgets are adequate, but that they be operated as "general industrial or occupational" (normally called Type B) programs of a semiskilled and operator level for the quality student now enrolled; that each high school trade and industrial education program be re-evaluated in terms of the above proposed conditions, and that those which fail to improve adequately their programs be dropped as approved occupational programs; that reimbursement from State and Federal vocational funds be reduced to not more than 25 per cent of the portion of the instructor's salary chargeable to the program; and that those schools which cannot improve their programs to meet adequate minimum standards continue the courses as industrial arts (general education) for exploratory, consumer, avocational, and general education values.

5. That high schools in communities of 5,000 or more population, and other schools wherever possible, initiate, with proper safeguards, standards, space, and qualified teacher coordinators, diversified (part-time) cooperative programs of vocational education[8]; that organized pre-service and in-service teacher training program for coordinators precede expansion of this type of program; that reimbursement from State and Federal vocational funds be not more than 50 per cent of that portion of the coordinator's salary chargeable to the program; that a minimum of 12 and a maximum of 24 students be established for eligibility for reimbursement; and that no program be approved for reimbursement until a functioning advisory committee is formed and is scheduled to meet a minimum of two times each year.

6. That no vocational trade and industrial education program, either occupational or cooperative, be undertaken by any local school until it has shown that potential student enrollment and interest are adequate to support the program, job opportunities in the service area of the school indicate the need for particular types of training, the school district in able and willing to support financially the classes, members of the policy making board and the school administration of the district involved are sympathetic, interested, and willing to establish a favorable climate for quality vocational instruction, the school staff has been apprised of plans and are sympathetic to the vocational program, local employers will cooperate in the development of the program, parents understand the objectives of the program and are interested

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[8]This type of program has proved to be, with proper organization and coordination, a very economical method of preparing noncollege-bound high school youth for successful employment in both distributive occupations and trade and industrial occupations of the semiskilled and service type.

in its special education services, skilled journeymen and other employees in the community will support the program, that the educational philosophy of the school recognizes the contribution vocational courses can make to the total educational program of the community, and all individuals, groups, and agencies involved insist on a quality program's being organized and operated.

7. That high schools not now offering vocational distributive education courses be encouraged to do so as outlined in Recommendation 6 above.

8. That high schools strengthen their business education (office occupations) programs by reorganizing them in line with recommendations of a local advisory committee composed of selected employers and potential employers of graduates.

9. That high school districts become "satellite," or extensions, of the proposed Technical Education Centers for purposes of extension courses for skilled, technical, and supervisory personnel; that space for the extension courses be provided by the local school at no cost, with the possible exception of custodial service when essential; and that all other costs, program organization, teaching staff, and supervision be the responsibility of the TEC.

The Role of the Maine State Department of Education in Vocational-Technical Education

Very important in a leadership, coordinating, and supporting role in public vocational-technical education is Maine's State Department of Education. Since the major authorized emphasis in the survey being herein reported was trade, industrial, and technical education, most, but not all, of the Survey Staff's recommendations in this report deal with this aspect, at both the high school and the post-high school levels.

Concerning the role of the Maine State Department of Education in the field of public trade, industrial, and technical education, IT IS RECOMMENDED:

1. That the practical nurse program be placed under the supervision of the Director of Trade, Industrial, and Technical Education in the State Department of Education, and that the title Director, Practical Nursing Education be changed to Supervisor of Trade and Industrial Education for Girls and Women.

2. That the position of teacher educator for trade, industrial, and technical education be retained and filled as soon as possible by a professionally prepared, qualified person to work with all full-time trade and industrial teachers including those in practical nurse programs, in the improvement of trade and industrial education in high schools and post-high school institutions; that a cooperative relationship be developed with one or more of the State colleges so that trade and industrial teachers may be provided the opportunity to obtain teacher training service through either the State teacher educator or from appropriate staff members of a cooperating teacher training institution, and that credit toward a BS degree be given for instruction provided either on campus or in the field.

3. That the State organization for the trade and industrial education services be as shown in Figure 4.5.

4. That improved standards of acceptability for housing and equipment for trade and industrial programs be developed and applied by the State staff.

5. That the State standard which requires the use of functional advisory committee (craft and/or general) for all trade and industrial programs be applied by the State supervisory staff.

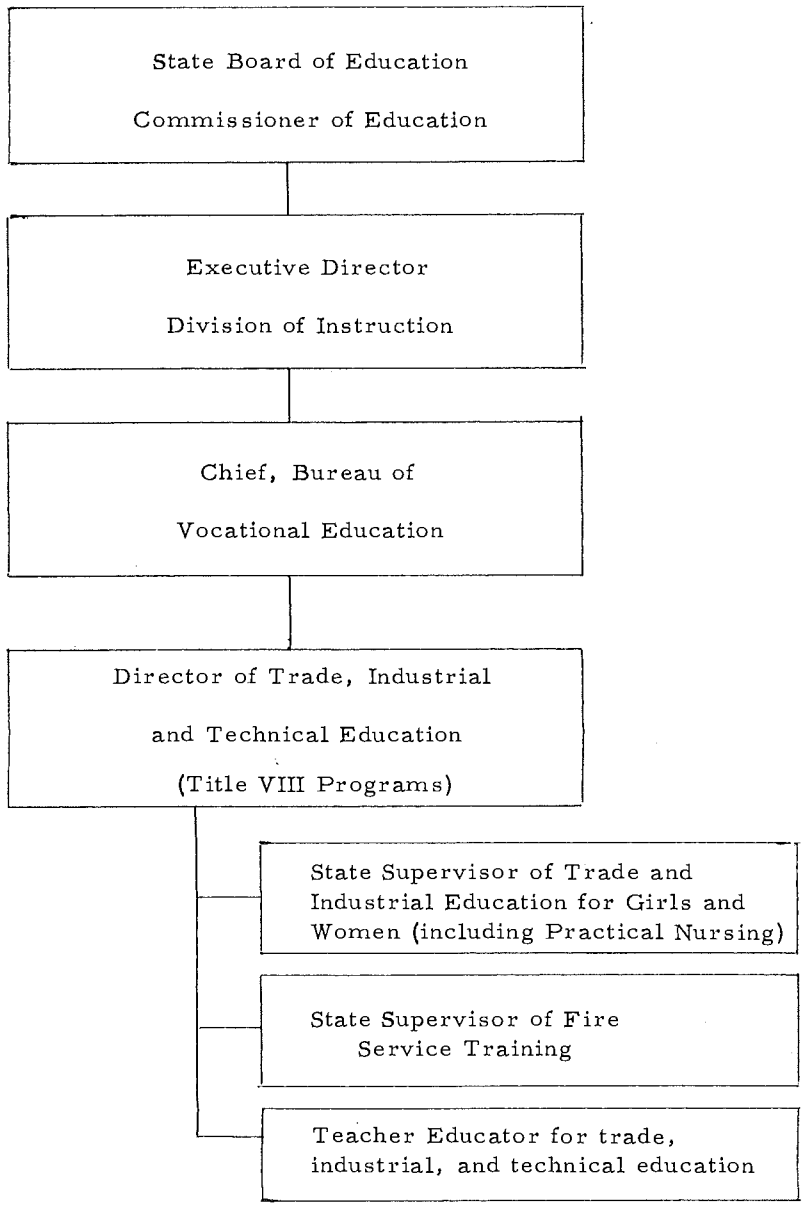

Fig. 4.5. Proposed Organization of the Trade and Industrial Education Service, Bureau of Vocational Education, State Department of Education

6. That a long-range program be developed by the State trade and industrial education staff for training potential leaders for future key positions.

7. That existing educational and professional qualifications of trade and industrial instructors be gradually increased.

8. That additional emphasis be placed by the State staff in trade and industrial education upon a State-wide plan for better qualified local personnel to provide organized instructional supervision.

9. That the State trade and industrial staff take the initative in developing and recommending the use of improved admission standards and selection procedures for the various occupational classifications in which training is provided, particularly in the Technical Education Centers, each admission standard to reflect the employment requirements of the several job classifications that are the objectives of each respective program.

10. That the State staff promote and encourage in every community with potential training stations a diversified (part-time) cooperative program, with a properly trained coordinator to meet the trade and industrial preparation needs of both high school youth and local employees.

11. That the appropriate officials of the State Department of Education, with the help of the Director of Trade, Industrial, and Technical Education, develop a minimum program of industrial arts and encourage local boards of education to install new programs and improve or expand present programs in both junior and senior high schools as well as to make industrial arts available to all students as an elective.

12. That organized labor's strong interest in and cooperative attitude toward post-high school vocational education, particularly trade and industrial education, be recognized by the State Department of Education and local schools, and that this support be utilized in the development of the Technical Education Centers to serve the educational needs of youth and adults, including indentured apprentices.

13. That the manifest interest in vocational trade, industrial, and technical education on the part of industrial management also be recognized by the State Department of Education and local school boards and administrators and that it be strengthened and brought into focus on the problems of developing the Technical Education Centers in the State.

14. That the State trade and industrial education staff contact more experienced states for help, both material and consultative, when planning new or unusal programs. [9]

15. That the Maine State Department of Education consider each practical nurse program now operating or planned in the future as a part of one of the Technical Education Centers, and that such a program be administered by the given Center.

16. That fire service training programs now in operation or any planned future services of this general type such as law enforcement, custodian training, or school bus driver training be considered by the State Department of Education as a part of the program of an appropriate Technical Education Center, and that such training programs be administered by the given Center.

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[9]For example, Alabama, Missouri, New York, Ohio, Tennessee, and Texas all have publications of value to the diversified (part-time) cooperative program.