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ABSTRACT

To develop a coordinated and systematized program of curricular design, a steering committee met with the vocational directors of several large cities, conducted extensive literature reviews, visited several institutions involved in research and teaching activities, and made contacts with personnel in various Federal agencies. In the area of curriculum development, the most effective approach appears to be instructional content derived from explicit analysis of desired behavior after graduation, rather than from a selection of excerpts from a total body of knowledge. Each curriculum should be defined by what technology and industry need for job success. A proposed solution to problems encountered with the current method of curriculum development (teachers writing for personal classroom use) is based on the probability that a cooperative approach by several large school systems with effective research support and management assistance can gather the financial resources (Federal, state, local, and industrial) to accomplish the tasks. From this base, each school system would sponsor independent development in one or more specific job family areas which would be implemented, field tested, and nationally disseminated. In addition to effective management, the plan also includes inservice staff development and evaluation techniques. (SB)

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Final Report

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CURRICULUM DEVELOPMENT IN VOCATIONAL EDUCATION (ORGANIZATIONAL PHASE)

October 29, 1971

U.S. Department of Health, Education, and Welfare

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ABSTRACT

Defines needs for massive curriculum development in vocational and technical education programs in the member schools of the Council of the Great City Schools, Washington, D.C.

Identifies major sources of information for presentation of plan to incorporate individualized instruction, staff development, curriculum materials, validation of job families.

Presents plan to include local member school systems as part of national network, with assigned responsibility for specific job clusters, plans for quality control, dissemination, validation, and updating.

Examines potential application of instructional systems approach, alternatives for local schools, i.e., performance contracting, publisher affiliation, etc.

Suggests funding alternatives for job family through state, federal, local funds. Also suggests management plan, organization and possible functional approach to accomplishing objectives.

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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I. INTRODUCTION

The problems associated with vocational - technical education, with the training of learners in a multiplicity of skills for successful and fruitful employment, are manifestly complex. Viewing these problems in the environment of the large city public system compounds the problems.

Those responsible for initiating and implementing programs in this general area, Directors of Vocational and Technical Education of the member cities of the Council of the Great City Schools (see Appendix A), seemed to gain new enthusiasm with the resources afforded by the Vocational Education Act of 1963. Such a commitment by the Federal Government (and the close coupling made possible by state-local allocations, coordination, and program development, thus facilitating its administration) gave promise and hope for large strides in attacking the problems on a scale never before possible.

At the same time, the Council of the Great City Schools, through a standing committee structure, constantly strived to have needs, problems and potential solutions shared among the twenty-two school systems it served.

Embodying the major work of this committee, a publication was issued in 1968--Occupational Education in the Great Cities--[A Statement of Position and Critical Concerns].

The following general principles are appropriately restated.

"The challenge to provide relevant, broad, and improved programs for preparing youth and adults for the world of work is urgent in the Great Cities of our nation. As school districts begin to structure, develop and implement appropriate programs, the following general principles should guide their efforts.

"We believe that:

1. Programs of occupational education must be an integral part of the educational process; they must be embraced in the total program of education. For many individuals, occupational education can serve as a motivational force for developing academic skills as well as desirable personal and social attitudes.

2. Occupational education must be sufficiently broad and varied in scope and be offered at all levels of career preparation to meet the needs of all youth.

3. Occupational education must develop from a broad base in the early years to more specialized programs in later years as individual interests and needs are identified.

4. Occupational education must provide opportunities for continuing programs beyond the secondary school level to encourage upward social and economic mobility and to provide motivation for adequate career development.

5. Organization of programs of occupational education in the school system must be determined by its effectiveness in realistically serving the individual needs of the students enrolled.

6. Community involvement should be encouraged to promote understanding and support of the entire educational enterprise and to assure that programs are timely and relevant."

BACKGROUND OF THE STUDY

For some time after the report was issued indicating the goals held in common above, the vocational education directors met with the Council of the Great City Schools twice yearly at the Board of Directors meetings to formulate an action program which would address the needs stated on a nationwide consortium basis.

Sessions at the national meetings were concerned with appropriations plans from the Federal and state levels, major thrusts in individual cities identified as worth sharing among the other cities, the work of the National Advisory Council on Vocational Education, the American Vocational Association, presentations of significant programs involving educational technology--all in an attempt to develop a focus for and a potential agency for assembling a "critical mass" of people and resources.

Under Council leadership, and with a steering committee of the Great City Vocational Education Directors, a proposal was presented to and approved by the Board of Directors at their Fall, 1970, meeting. Then, a decision was made to approach the U.S. Office of Education to request a planning grant for a six month period in the amount of $50,000. Subsequently, an amount of $25,000 was allocated and work began January 1, 1971.

Problems Under Consideration

At the heart of the problems identified is that curricular conceptualization, research, planning, implementation, modification, dissemination, and evaluation are not conducted under a national or regional network. Also absent is a system that would provide for progress in some structured form. The tragic result has been a proliferation of "courses of study," "course outlines," and "curriculum guides." These have served some local purposes, but they are costly and have had little impact on our national problems in the vocational curriculum.

For many occupations one may find hundreds of "courses of study" that are so similar in content, format, and style that it is unfortunate we have expended our limited resources to duplicate the results. For other occupational fields, "courses of study" are almost totally unavailable. If all of the separate efforts had been part of a coordinated system for curriculum development, the potential of vocational education would have been much nearer fulfillment.

Furthermore, it became apparent, through contact with local and state leaders, that there was some concern for appropriate and relevant "job families" and "job clusters," that there were competing notions, none resolved, little validation as to which were pre-eminently necessary or important with respect to local and regional needs or shifts that major clusters were

undergoing in the real world of work. Additionally, many agencies in and out of USOE were sponsoring fragmented efforts to establish the validity of certain job streams in a fashion least useful for understanding, interpretation and potential programming within the Great City Schools. A key problem, therefore, was to marshal this information, attempt to make it known, and to make it subsequently useful.

The more essential aspect of the problem was the presentation of a massive, coordinated, systematized program of curricular design, implementation, dissemination, evaluation, and revision. Two specific tasks were identified in this context, with the realization of the funding constraints clearly in mind:

1. Instructional systems for the major job families should be developed, implemented, field tested, and nationally disseminated. This should take place in the major school systems of our metropolitan areas.

2. The application of effective management and evaluation techniques ought to be undertaken in the major cities of this country as an integral part of instructional system development and operation.

A major element of the problem exploration was seen in the location, acquisition, synthesis, evaluation and presentation of information. Initially, this process obtained within the Great Cities agency itself and expanded outward, as will be discussed later in this report.

Another problem which was addressed involved the subtle aspect of "selling" and "sustaining" the merits of a consortium of the vocational education directors -- in other words, to develop and deliver a program which would have realizable benefits wherein their time and commitment would warrant continued, high level involvement. A "real world" problem that vocational directors face is the competition for their attention and sustained involvement, in light of the shifting local funding patterns, impacts of local urgent demands, sensitivity to state funding shifts, and the balancing of a proliferation of program directions.

Project Objectives

At the outset, it was seen that the advantages needed to be spelled out clearly and that the objectives to be accomplished needed consensus. The advantages to the member cities were given as follows:

1. Spread costs among governmental levels, states, cities, schools, and private agencies.

2. Concentrate resources from several geographical areas.

3. Eliminate redundant activity and thus realize needed economies.

4. Ensure centralized quality control.

5. Develop disseminable products and replicable instructional systems.

6. Provide many schools, through the dissemination of quality products, the means for dispensing with irrelevant and inappropriate curriculum development.

The objectives agreed upon concerned organizational activities as follows:

1. Determine feasibility of proposed strategy for program design and implementation.

2. Outline specific activities through which general objectives can be accomplished.

3. Communicate with LEA and SEA personnel with regard to project purposes and the nature of local activities.

4. Estimate resource needs and identify funding sources.

5. Secure commitment from LEA's and SEA's who wish to be involved.

At the same time, objectives were projected for an operational phase. The primary objective of this phase was to develop a new curriculum in Vocational Education appropriate to the needs of students in large urban centers and compatible with contemporary career opportunity requirements.

In advance of preparing for specific activities to perform in a planned fashion, pooled wisdom suggested that certain criteria and/or requirements be advanced. They are as follows:

1. A systems approach must be utilized. Within each job cluster the learning must be developed in behavioral terms so that instruction and evaluation can proceed systematically. The curriculum development activities must have centralized control. The programs will be carefully monitored to evaluate the management control and to assess the efficacy of instruction.

2. Instruction must be individualized. Each student can progress at his own rate to whatever level his talents and efforts permit. The instructional system must have alternate methods of learning so that many student learning styles can be accommodated.

3. Instructional units must provide multiple entry and exit levels. A "zero-reject philosophy" must be adopted so that no student will be denied entry into an appropriate level of occupational preparation in any job cluster.

4. Programs must generate employable skills. The instructional units must be designed so that at each exit level the student possesses employable skills.

5. The curriculum must be designed around "job clusters." The curriculum should be structured into major "job families or clusters" so that important occupations and occupational areas are not excluded. Means should be devised for the rapid publication and dissemination of curriculum materials.

6. Instructional modules should place a strong emphasis on affective behaviors. All should contribute to the development of the appropriate attitudes necessary for obtaining and maintaining employment.

7. In connection with each curriculum area, instruction must culminate with multiple options available to students. Vocational guidance will be an important segment of the program. Job placement will be provided for those students desiring immediate entry into the world of work. Those students desiring to continue their education will be assisted in finding appropriate institutions.

Presented above are the rationale, the objectives of the project. Section II will consider the procedures used to gather information relating to the objectives, contacts, etc., which are fashioned into the operational plan presented later in the report.

II. PROCEDURES

As indicated above, a major effort was made to collect information so as to develop a base line of intelligence. Implicit in this enterprise was a multitude of personal contacts by Council staff.

As a mechamism within the Council itself, a steering committee was elected for the tenure of the project--persons who had been involved in the earlier effort which produced the 1968 document cited above. For the duration of the project, monthly meetings were held involving the Vocational Directors of Philadelphia, Dallas, Baltimore, Pittsburgh, Cleveland, and Los Angeles.

These meetings accomplished several purposes:

1. Conveyed information regarding state plans for vocational funding.

2. Furnished inputs rega·ding problems and solutions in local curriculum developments.

3. Focused on vocational programming requirements stemming from observed shifts in job markets and level of training requirements.

4. Presented a forum for resource people from the USOE, National Advisory Council on Vocational Education, American Institutes for Research, Project ABLE, and selected vendors of materials and equipment for vocational and technical education.

5. Made possible a continued measure of the level of commitment of LEA participants.

6. Validated the curriculum criteria indicated earlier under "Objectives".

7. Assisted in determining realistic operational strategies, sources of local funds, local resources, in-service staff development needs.

8. Served as a lateral (within Council) dissemination resource.

Extensive reviews were conducted of the literature as follows:

- Summaries of research and development activities sponsored by Federal and local agencies themselves and/or contractors. They included, in brief, the ERIC files, the DOD Clearinghouse, National Center for Technical Information, Department of Commerce,

manuals and reports covering the work of the major armed services facilities (Air Force Technical Training Command, Army Training Command, U.S. Navy Bureau of Personnel, Special Devices Center).

- Reports of national organizations in technical training--American Vocational Association, American Society for Training and Development, and agencies in the Federal establishment--Manpower Commission, Department of Labor, National Jobs Program.

- Training reports of the System Development Corporation, Rand Corporation, American Institutes for Research--experimental programs sponsored under ES'70 and by state vocational and technical agencies.

Selected visits were made to the following sources:

1. Project ABLE, Quincy Public Schools, Mass.
2. Center for Vocational and Technical Education, Columbus, Ohio
3. Center for Occupational Study, Durham, North Carolina
4. American Institutes for Research, Pittsburgh
5. Education Collaborative for Greater Boston, Cambridge, Mass.
6. Vocational Education Programs in Philadelphia, Washington, D.C., San Francisco, Dallas
7. Sterling Institute, Washington, D.C.
8. New York Institute of Technology, Long Island
9. Andover School of Business, Mass.
10. University of Maryland, Dept. of Vocational-Industrial Education, College Park
11. U.S. Naval Academy, Annapolis, Md.

Contacts within the Federal government included:

1. The Department of Labor
2. Director, Exemplary Programs, BAVTE-OE
3. Director, Vocational Programs, BAVTE-OE
4. Director, Adult Basic Education, BAVT-OE
5. The Associate Commissioner, BAVT-OE
6. The Associate Commissioner, NCERD-OE, and several program associates

Contacts were made also with personnel attached to congressional staff committees whose task was to consider revisions of extant legislation relating to state vocational programs, emphases required in manpower training, and the interpretation of interagency requirements for funds and programs relating to the Council's stated objectives--all of this to flesh out potential sources of funds and program directions as seen by congressional leadership. In May, 1971, a legislative assistant for a key committee of the House prepared and delivered a summary for the entire Council Vocational Committee in San Francisco.

All of the information yielded by the above furnished the grist for discussion and subsequent decision-making by the steering committee working in behalf of the Council of the Great City Schools and its standing committee of Vocational Directors.

The synthesis of the activities described will be presented in the section following.

III. FINDINGS

Certain findings (results of the examination of data and other resources) seem clear and they are presented here. Following the findings an operational plan will be presented.

In the area of curriculum development the most notable and effective approaches devolve from new ways of perceiving the content to be taught in terms of behavior desired. This means simply that instruction should derive its content from explicit analysis of desired behavior after graduation, rather than from a selection of excerpts from a total body of knowledge. Each curriculum should be defined by what technology and industry need for job success. In today's curriculum terminology, we must deal with the following subordinate objectives in the design of viable and effective teaching and learning:

1. Development of educational objectives. The intent here is to identify the behaviors which are desired of the student when he has completed a particular course of instruction. Education has no meaning in the abstract--objectives need to be stated in specific operational terms. While emphasizing the vocational area of educational goals, the goals also include the development of individual attitudes toward work, habits or work, and standards of excellence.

2. Derivation of curriculum requirements. Curriculum needs must be described in terms of topics within each "subject" and are placed in an instructional sequence which takes prerequisite knowledges systematically into account. Each learning sequence is in the curriculum because it must be there if the student is to be competent, and because the justification for its presence can be demonstrated on the basis of relevance to an occupationally-oriented educational goal. There is the need to analyze the requirements of many jobs within each vocational area for common and related skills, to attempt to provide education in the skills and knowledges which are common to a variety of occupations. This should minimize the amount of "new" training required by a change in job technology or by a desire to take advantage of opportunities opening up in related areas. This should also provide the flexibility needed to accommodate to changes in the demands of the technology.

3. Description of needs for prerequisite learning. The elaboration of a new curriculum is intended to make possible the specification of prerequisite knowledges to be acquired in junior high years of schooling, including the kinds of student preparation which might be gained in industrial arts and other basic areas of instruction. The aim is the development of broad exploratory programs in the junior high grades to prepare students for productive educational and vocational careers.

4. Effecting changes in student viewpoints. A most difficult task facing any student and his family is that of choosing realistic life goals and the educational path to those goals. The pressures of our society have been directed toward college attendance, while trade school courses have often been relegated to second-class status. There is the need to prepare an organized program for assessing each student's abilities and interests and for helping him and his family evaluate them over a wide range of occupations. This involves the in-service training of junior high school guidance counselors and the provision of materials and information for junior high students.

5. Individualizing instruction. It has been demonstrated repeatedly that individuals differ with respect to their abilities. The traditional classroom has not made sufficient provision for these individual differences, but with increasing frequency, especially at the elementary level, schools are changing to individualized study programs. There is a need to incorporate the concepts of individualized instruction by providing a framework which will allow for maximum flexibility of student progression through a course. Learning is a process aided by the teacher, rather than a schedule (or process) of forcing facts into students. A student's achievement paces his progress and, at the same time, constitutes a primary source of his motivation. The student is given a set of objectives which tell him all the things he is expected to be able to do after completing an assignment. The key feature is, however, that students do the learning largely on their own. Student-teacher interactions do not take place during lectures and group demonstrations, but rather are emphasized while the teacher gives attention to individual student needs during the learning of new skills.

6. Student evaluation. Appropriately derived topic objectives lead directly to measures of student performance. It is desired here that all "units" of instruction have performance measures which are available to the student, to instructors, and to guidance counselors. These proficiency tests are an essential and integral part of individualized instruction, and they contribute to making the student evaluation file a clear history of learning achievement. Emphasis in this testing is on attainment of goals, rather than upon differentiation of students into "good" or "poor," and on providing directions for future effort on the part of the student.

7. Program evaluation. A comprehensive program of evaluation includes objective measures of immediate outcomes, as well as the means for systematic assessment of long-range effects. Student evaluations yield many of the basic data for program

evaluation; this requires systematic recording and storing of indicators of student experience and performance. Establishment of techniques for following up the student at periodic intervals after graduation to collect information on employment, job success, and career progression constitutes the basis for program evaluation in terms of its long-range effects.

8. Development of multiple exit flexibility. The development includes a planned set of training levels of specific education within each technical area, requiring a range of preparation times designated by jobs (or job clusters). The domain of jobs in an occupational group has been structured to reflect the progression of skills inherent in those jobs. Selection of jobs to represent the area reflects the levels involved so that there are clear points of demarcation whereby students can attain certified competence up to different levels commensurate with their individual abilities. This concept of multiple exits at various training levels also will provide specific usable skills for each student regardless of the point at which he chooses to terminate his full-time school activity.

It is doubtful that any school system at this time is at the operational stage of "individualized instruction" so as to be able to implement the notions presented above. The development and implementation of individualized instruction is a major theme for current educational innovation and may be, in sum, the only effective approach to meeting the problems associated wit the wide variance in individual learning styles and preferences while maintaining local control over the instructional process.

While there is consensus on the major aspects of curriculum development noted above, the Council found less tenable the denotation of the job cluster concepts available. While not disturbing in and of itself, the matter of job clusters was a major concern of several representatives. Among the job cluster proposals are those from the Dictionary of Occupational Titles, Department of Labor, the Oregon State Department (in conjunction with the Oregon State University and the Portland Public Schools), and that presented in the context of "Career Education" being promulgated by the Commissioner of Education, sometime after the beginning of this project.

The fifteen "occupational clusters" proposed in March, 1971, are as follows:

1. Business and Office Occupations
2. Marketing and Distribution Occupations
3. Communications and Media Occupations
4. Construction Occupations
5. Manufacturing Occupations
6. Transportation Occupations
7. Agri-Business and Natural Resources Occupations
8. Marine Science Occupations
9. Environmental Control Occupations
10. Public Service Occupations

11. Health Occupations
12. Personal Service Occupations
13. Fine Arts and Humanities Occupations
14. Consumer and Homemaking-Related Occupations
15. Hospitality and Recreations Occupations

One can conclude that the tasks associated with definitive classification and tenability of job clusters need more attention in terms of their applicability on a nationwide basis and more particularly on a regional basis. In discussions with the Council Vocational Directors, it was clear that the generators of job clusters had ommitted in-depth validation of particular clusters from authentic tracking sources at the state and local level--that apart from organization of the categories, there were few projections of specific needs which planners and course designers could depend on for definitive scope and sequence program development.

In the light of the gross and global nature of the problem above and its lack of solution, individual systems have no context for growth and development. Instead, they opt for subsets which seem appropriate to a defined local need resting perhaps on the expertise and resources of personnel handy to the district and interested. Thus, one of the leaders in curriculum development has attacked first Power Mechanics, Woodworking and Electronics. Even so, the Council's site visit revealed that an inordinate amount of local, state and Federal monies were expended to get these content areas into production and distribution for student use. Originally granted some $600,000 during the height of the ES'70 program, the sum is now expended and the program continued under a $50,000 award by the state department (Quincy, Mass.).

Project ABLE at Quincy represents an important vestigial program which did not realize the pay-off that could have come through more astute monitoring and coordination of effort by the Federal establishment. In tribute to the effort a score of cities, including several of the Council members, regularly use materials developed by the Quincy Schools in conjunction with American Institutes for Research.

An important contribution has been made by this effort, which now appears to be token in terms of resources needed to tackle the vast problems which attend training for the world of work. This effort has not only incorporated materials for selected content areas but it also includes staff development training for school systems considering the use of ABLE materials.

While this is no promotional piece for the project in Quincy, there are aspects of its accomplishment which merit consideration if only to offer some kind of baseline data for an expenditure on the order of an exponent needed to make a massive impact on curriculum development and changes in approaching the organization and presentation of meaningful vocational material for diverse student backgrounds, interests and aspirations.

The field testing of Project ABLE materials on a planned national basis was constrained by the lack of funds.

School directors have learned that the installation of a program is more easily accomplished via valid, well organized learning packages, that having something tangible to present to teachers will effect more changes than other methods. Thus, one prominent vendor discerned, early on, the attributes of the Project ABLE approach and content and has done a remarkable business selling "Project ABLE" transparencies.

Our findings suggest the need for a large complement of staff development at the local level which includes but is not limited to materials preparation. Individualized instruction incorporates much more--evaluation planning and support, materials quality criteria development, criterion-referenced performance evaluation instruments, aspects of vocational guidance, etc.

In performing this phase of the study, we were pleased to have interest expressed in the problems and potential solutions by agencies both public and private who saw their particular expertise as lending support to a consortium--these include tests and measurements, publishing, research and development, materials developments, and data processing.

Finally, our findings strongly suggest "performance contracting" may be an important vehicle to consider in some aspect of implementation later on. This is one of the potential alternatives open to local school systems.

IV. CONCLUSIONS

Faced with burgeoning problems, directors of Vocational and Technical Education in the Great Cities require gigantic resources, people and expertise, to make even small inroads.

In terms of the modest sum devoted to this study the Council was able to access its own constituency frequently to validate the problems, their intensity, their priorities, to discuss pooled information regarding instructional developments, surveys of practice, costs, to exchange information regarding state plans and Federal priorities.

Limitations of time (the project was six months) and resources prevented close coupling with cognizant State Education officials and local boards of education.

Nonetheless, the end product is an operational plan wherein instructional systems for the major job families will be developed, implemented, field tested and nationally disseminated. Such development is to take place in the major school systems of our metropolitan areas--members of the Council of the Great City Schools.

This plan is to include the application of effective management, in-service staff development, and evaluation techniques as an integral part of instructional systems development and operation.

V. OPERATIONAL PLAN

A. Discussion

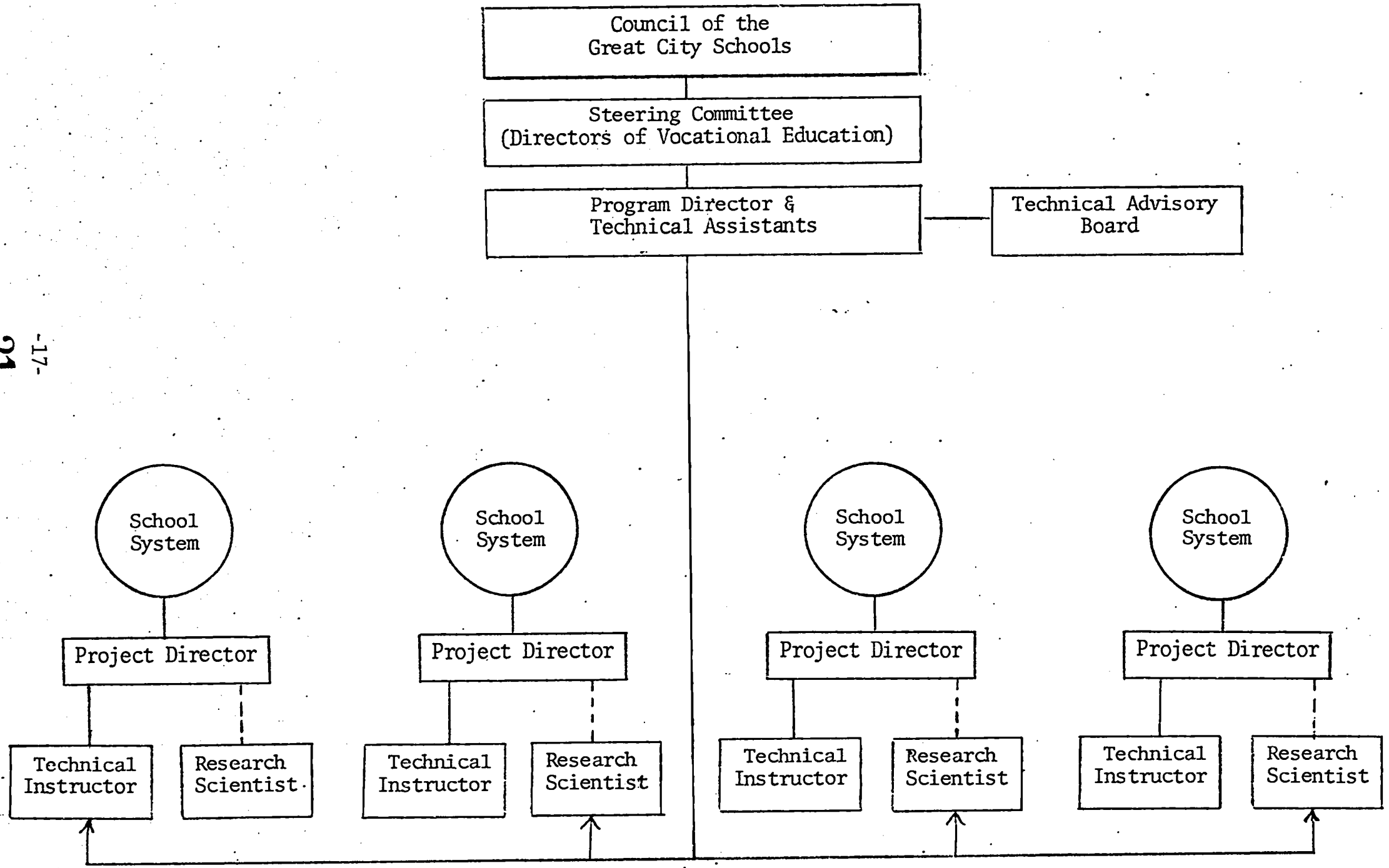
No individual school system, sponsor, agency, industrial or private developer, or research organization could possibly accomplish all of the defined tasks. It is also unlikely that any one school system could make any sizable contribution of national significance to the curriculum needs in vocational education. The problem in the area of learner-centered vocational curriculum development is simple to define--inadequate resources. This would include the lack of a systematic application and concentration of available funds, and the inefficient use of available trained staff.

Furthermore, on a small and limited basis, the current method of curriculum development (teachers writing for personal classroom use) is not practical because of the lack of assessment, uneven quality, and questionable benefits from the high development cost. We can now accept the fact that a rather high level of funding is necessary for developing instructional systems. Such a level of funding can be justified only if the materials and systems can be used widely. Such replicability requires a high degree of quality control in the developmental process. Quality control cannot occur without proper and effective management and evaluation procedures. This is not possible without the direction of highly structured performance accountability type contracts. Such contracts require experienced and competent research and management personnel to structure and implement the contracts. Effective policy direction is necessary, and expert technical advisors of national stature are needed to monitor development and implementation. In short, the developmental effort must focus on system design analysis, management by objectives, technology of instruction, quality assurance and performance, and accountability contracting.

A proposed solution to these problems is presented in the following pages. The plan is based on the high probability that a cooperative approach by several large school systems with effective research support and management assistance can gather the financial resources (Federal, state, local, industrial) to accomplish the tasks. From this base, each school system would sponsor independent development in one or more specific job family areas. This would also enable a concentration of resources within each city and reduce the duplicated effort now taking place within and among such school systems. For example, Pittsburgh could reduce its usual curriculum development efforts in job family X (since Baltimore or Philadelphia or one of the other Great Cities would be concentrating resources in that area) and divert its resources to work in area Y. Widespread use, relevancy and applicability in the other cooperating schools, and on a state and national scale as field testing progresses, would be assured through the highly structured management procedures. This would be accomplished under the direction of a Steering Committee through the Program Director and Project Directors. (See proposed organization chart on following page.)

Funding for the Council of the Great City Schools management team (Program Director, Technical Assistants, and in addition one research scientist per job family), according to several vocational directors, can be provided

PROPOSED ORGANIZATIONAL CHART



under one or more optional plans (Federal vocational funds administered through the States, or Federal funds administered through the Department of Labor, Education, etc.). Funding for secretarial services, travel between the participating communities, communications, consultants, support for periodic Steering Committee meetings, and support for regularly scheduled Technical Advisory Board services would be funded from the same sources. Vocational administrators from several of the Great City schools have suggested sponsorship through the Council. This could be accomplished through membership fees. Should 15 or 20 Great Cities be involved, "membership" costs to each system would be about $20,000. In any event, alternatives and potential sources should be a major topic of discussion at the scheduled planning conference. Participants should explore carefully all possible avenues prior to the meeting.

The Council will assist cities in the preparation of proposals to their states by developing a "model" proposal that can be modified to suit state and local conditions. The strong points of the proposal would be the system design features, management features, technology of instruction, quality assurance and performance, and accountability contracting with trained staff available to assist in the operations. Important also would be the availability of field test systems (other members of the Great Cities group) at no cost to the sponsor. Each participating school system would establish an exemplary demonstration center for local, state, and national dissemination for the job family under development. This would also be the center for the training of instructors and curriculum development support personnel. More important, the investment (through reciprocal activity in the other partner systems) would result in the early establishment of additional demonstration centers for other job family areas. This is a kind of "pay for one and get a dozen" bargain, and such proliferation of quality instructional systems at the "grass roots" level is a highly desirable outcome. Again, it is only through centralized coordination and quality control procedures with a number of locally initiated and supported developmental units, that the desired results and products would be guaranteed. Actually, the development would be in a way decentralized, in order to gain access to the student target population during the critical initial develop/test/revise/retest cycles of instructional systems development process.

Proposals submitted to states by the respective schools would require local control of funds and the identification of a local Project Director who could also serve as the coordinator to the technical management team. State and/or local funding would be required to cover the usual project expenses, including reproduction of materials, communications, travel, etc. Of course, cooperating field test schools would be expected to pay for all materials received (the experience of one curriculum developer with teacher-training sessions and material purchases for the Power Mechanics field test showed a rather small expense for the cooperating schools.)

The effort required to complete the proposed development has been estimated at from four to five man-years per course-year, depending on the availability of job and task analysis information and behavioral objectives from organizations such as the military. The number of course years varies by job family. In order to maintain a reasonable schedule, it is therefore recommended that each job family team include at least three to four members.

(Of course, the local Project Directors who are able to devote full time to the position would also function as writing and research team members.) The local Director must be willing to share the team leadership with the research scientist in the developmental work.

System teams for each job family area must include at lease one full-time research scientist experienced in job and task description, derivation of behavioral or performance objectives, development of criterion exams, and program development for vocation-technical education. Since it is not likely that such expertise would be found within a school system (or in a position where adequate time could be diverted to the proposed development), individuals qualified to fill these positions would be supplied by the Council through its present staff, hiring of additional staff, or through subcontracting. Effort would be made by the Council with the assistance of the local community, to recruit such individuals from among the residents (the industries, the military, the universities, and research organizations) within the respective metropolitan areas.

The local system would provide three full-time content experts (trade experienced teachers) for each job family team. Again, state support and reimbursement are available. However, local school system funding for persons from its instructional staff should not be a major problem. Such persons should have a commitment to individualized instruction and the application of the behavioral sciences typified by the goals formulated by the Great Cities. Demonstrated proficiency in curriculum development and in the writing of well structured test instruments and learning materials would be essential. Proficiency in the development of "hands-on" shop instructional materials must be evident. Experience in the development of training aids is also important. Since there are a number of individuals with such capability in vocational and technical education, the problem becomes one of a thorough in-house talent search. Utilizing local talent, teamed with behavioral scientists, given adequate time and funds, under proper supervision, with efficient management and evaluation techniques, should enable the meeting of conditions of a performance contract--a performance contract incorporating quality control and accountability for specified results.

One secretary per job family area should also be provided by the local school system (and again, state support could be secured). Student typists and clerical help would be necessary.

The housing of R & D teams in school-provided offices can result in significant savings on rental space and project overhead. More important, it places the developers near the site of the testing, which is to be accomplished module-by-module through test/revise/retest cycles. Office furniture, telephone service, library services, and various other functions which contribute to operational economy, would be provided locally.

In short, the costs to each member system would be modest. Furthermore, each city would likely face only minor obstacles in securing state funding for: (1) Great Cities membership, (2) one research scientist assigned to the local team, (3) three full-time instructors from the local

staff, (4) one secretary, and (5) miscellaneous project operating costs, including printing, communications, etc. Of course, should the appropriations bill now in process for vocational education be processed properly, additional options would be available for support of central management functions. Areas of possible involvement at the Federal level should be given careful consideration by all participants. The strength of the entire approach lies in the collective ingenuity and resourcefulness of the individuals from the member systems.

With the plan above, based on our findings, we believe there is a mechanism for accomplishing the objectives stated at the outset of this report.

In summary, the major advantages of this proposed plan include the ability to:

1. Spread costs among agencies, governmental levels, states, cities, and schools.

2. Concentrate resources from several geographical areas.

3. Eliminate redundant activity and thus realize needed economies.

4. Ensure centralized quality control.

5. Develop disseminable products and replicable instructional systems.

6. Provide many schools, through the dissemination of quality products, the means for dispensing with irrelevant and inappropriate curriculum development.

B. Additional Considerations

Steering Committee

Equal representation among the cooperating schools would seem appropriate. It is recommended that each school system provide one representative--the Director of Vocational and Technical Education. The Great Cities Council typically operates through such steering committees. The Steering Committee would provide direction and guidance to a Program Director. It would oversee all expenditures, receiving a monthly reporting of all expenditures. Overhead rates for the administrative services of the Council of the Great City Schools, a nonprofit public service research organization, are established by Federal government audit. The Steering Committee, through negotiations among its members, should be able to identify the priority job families for development. Designation of areas of concentration for the individual member systems should be handled likewise.

Technical Advisory Board

The Technical Advisory Board should include two to four nationally prominent scientists considered to be among the most knowledgeable persons in the technology to be applied. Persons of diverse backgrounds or from various subject disciplines would not be needed because of the nature of the performance contracts. (The individual school systems could lend considerable breadth to the various disciplines at little cost to the program.) Regularly scheduled project review and advisory services should be specified as a condition of the basic contract. Such services should also include reports submitted to funding sponsors.

Dissemination

Most major curriculum efforts have accomplished network or national dissemination through commercial publishers under the procedures established by the government (and very precisely supervised by USOE). In such cases royalties cannot be retained by the commercial producers and must be paid to the government. Only limited copyright privileges are awarded and all materials become public domain after a specified number of years.

Major national curriculum development efforts have been hampered without the aid of publishing technology in the preparation and printing of its curriculum materials. Furthermore, the cost of duplicating and short-run printing has been very expensive and time consuming. Handling requests for materials by various school systems has also been a burden on the project staff and its limited budget. The logistics of the proposed cooperative development could become quite a problem without the specialized assistance of organizations equipped primarily to handle such services. These are the kinds of services best deferred to commerical publishers. Such involvement of private industry usually results in quality printing, professional illustrations, and more and better multi-media aids. Such cooperation often leads to a considerable investment of private funds. Hopefully, such an involvement could accelerate the developmental process. It is significant to note that these kinds of arrangements are being actively promoted by the Federal government.

Length of Commitment

Short-term commitments would not likely be very attractive to the more competent and established curriculum developers. Some stability must be guaranteed. It is recommended, therefore, that at least three to four years be scheduled for the initial stages of development. Note that present projections from experience show that four to five man-years of work are required per course-year of instructional system development. (This implies that four men could complete one course in one year.)

Target Date

Commitments, if forthcoming, must be made during the spring of 1972. The program, if it is to be implemented, must be in operation by this summer. A later than summer starting date would likely be very difficult for the public school systems since staffing assignments are already in process for fall classes.

Costs

In addition to office space, materials, some local staff, etc., above normal expenditures must be anticipated during the early phases for each of the job family areas for: various teaching aids, materials, tools, some shop equipment, multi-media materials and equipment, etc. Adequate funds should be allocated for such items. Some loss of local control over curriculum development, because of the investments and involvement in shared decision making with other Steering Committee members, must also be considered a cost. Another such cost must be found in the fact that the Technical Advisory Board would likely exert some influence over development, testing and implementation. Loss of some flexibility at the local level with the advent of performance and accountability type contracts under carefully scrutinized cooperative development could be considered a cost.

C. Budget Projections

The foregoing organizational plan offers many alternatives for funding possibilities. Thus, the projections offered here are gross estimates.

First, is an array of funding sources and staff, etc. assignments possible--a potential format.

State and/or Local Funds	Federal or "Membership" Funds
Full or part-time coordinator--Project Director	Program Director
*Two to three full-time instructors	Technical Assistants (dependent on size of operation)
*One typist per job family area and adequate student help	One full-time professional curriculum developer--research scientist--per job family area
	Secretarial/Clerical
*Communications and postage, materials and supplies, consultants and services, travel, etc. (Only limited funding necessary in this area.)	Communications and postage, materials and supplies, consultants and services, travel, etc.

* Per job family area under development.

Second, a projection of estimated costs for a local school system per job family Development Area on a twelve month schedule.

	Local and/or State Funds	State and/or Federal Funds*
Local Technical Support Staff 3 persons @ approx. $14,000 each (Administrative overhead and services and employee benefits are not included.)	$42,000	
Secretarial/Clerical--assuming availability of considerable student clerical help (Administrative overhead and services and employee benefits not normally computed for public employees.)	6,000	
Communications and Postage	2,000	
Consultants and Services	1,000	
Materials and Supplies (Includes initial expanding activity in the various new areas being developed by other member systems.)	5,000	
Travel (Includes staff members receiving training in the various job families under development in the various member systems.)	3,000	
Research Scientist assigned to individual systems, one per job family. Costs shown include administrative overhead rates which may be about 32.6% depending on Federal government audit. Salary projections based on mean salary for Research Scientists. Costs also include 25% for employee benefits.		$26,000
Central Management: (Includes Program Director, Technical Assistants, dependent on number of job families under operation, and secretarial-clerical. Also, administrative overhead and employee benefits, communications and postage and extensive travel among the member systems for management personnel. Policy Board and Technical Advisory Board meetings--one or two per year. Materials and supplies. Consultants and services. Projections based on a 20 school system involvement.		20,000
TOTAL	$59,000	$46,000

*Until Federal funding patterns become clear, plans should be made for funding through state agencies.

Appendix A

Listing of Council of the Great City Schools Vocational Directors

DR. HELEN E. COOK
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*DR. BENJAMIN C. WHITTEN
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MR. JEFFREY J. KEATING, Director
Vocational Education & Industrial Arts
Boston Public Schools
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Boston, Massachusetts 02108 (617) 742-7400

MR. JOSEPH SCHMIDLE
Assistant Superintendent
Vocational Education
Buffalo Public Schools
816 City Hall
Buffalo, New York 14202 (716) 842-4694

MR. JOSEPH J. DIXON
Assistant Superintendent
Vocational & Practical Arts Education
Chicago Public Schools
228 North LaSalle Street
Chicago, Illinois 60601 (312) 641-4423

*MR. DONALD V. HEALAS, Director
Technical-Vocational Education
Cleveland Public Schools
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Cleveland, Ohio 44114 (216) 696-2929

*MR. BRAGG STOCKTON, Director
Vocational-Industrial Education
Dallas Independent School District
3700 Ross Avenue
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MR. CHARLES J. MACKEY, Executive Director
Adult, Vocational & Practical Arts Education
Denver Public Schools
414 14th Street
Denver, Colorado 80802 (303) 266-2255

DR. ELMER McDAID
Executive Coordinator
World of Work
Detroit Public Schools
5057 Woodward Avenue
Detroit, Michigan 48202 (313) 833-7900

*MR. J. LYMAN GOLDSMITH, Director
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Milwaukee Public Schools
5225 West Vliet Street
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MR. CHARLES F. NICHOLS, Director
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Minneapolis Public Schools
807 N.E. Broadway
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DR. SEELIG LESTER
Office of Instructional Services
New York City Schools
110 Livingston Street
Brooklyn, New York 11201 (212) 596-6204

*DR. WILLIAM T. KELLY, Director
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DR. JERRY C. OLSON, Asst. Supervisor
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MR. MARVIN R. RASMUSSEN
Director, Career Education
620 N.E. Halsey
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MR. RAYMOND J. SACKS
Divisional Director
Vocational, Technical & Adult Education
St. Louis Board of Education
O'Fallon Technical Center
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MR. FRANK LAWRENCE
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*Steering Committee members.