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ABSTRACT

This document incorporates the findings of a project initiated to find solutions to the problems of planning, designing, constructing, and utilizing facilities to house career education on the part of educational administrators. Traditional solutions, continually increasing costs, and the need for greater emphasis on the learning environment provided the impetus for focusing attention on the options for local determination with minimum emphasis on regulating procedures. Project findings fave rise to some recommendations that the multicenter and the nucleus-and-satellites concept be used; education be integrated more closely with the community; simulation techniques be utilized; that existing buildings sometimes be recycled; and that floating schools, schools-on-rails, and schools-on-tires be developed. (Author/MLF)

SPACES FOR
CAREER PREPARATION

FACILITY OPTIONS

by C. William Brubaker

MICHIGAN CAREER EDUCATION FACILITIES PROJECT

Author **CHARLES WILLIAM BRUBAKER, FAIA,** is President and Member of the Board of Perkins & Will Architects, Inc. of Chicago, Illinois. He is a graduate of the University of Texas and a Fellow in the American Institute of Architects. He frequently serves as a lecturer and has authored numerous articles in educational, architectural and general interest publications.

Additional copies of this publication, or others in the series of documents on Sapces for Career Preparation, may be obtained from:

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In January of 1972, The Continuing Education Service, Michigan State University, initiated a research project to become known as the Michigan Career Education Facilities Project. Funding for the Project was made available by the Vocational Education and Career Development Service, Department of Education, State of Michigan.

The relative newness of the Career Education Movement and the recognized need for planning, designing, constructing and utilizing facilities to house Career Education on the part of the educational administrators, facility planners and designers was evident. Traditional solutions, continually increasing costs and the need for greater emphasis on the learning environment prompted the State Educational Agency to give maximum attention to the options for local determination with minimum emphasis on regulating procedures. Hopefully, they will find this series of documents viable tools in their efforts.

The Committee on Architecture for Education, American Institute of Architects, reviewed the Project in its early stage and designated Les Tincknell of Wigen, Tincknell and Associates, Inc., Saginaw, Michigan, as its representative and liaison to the project.

C. Theodore Larson, Professor Emeritus, School of Architecture and Design, University of Michigan, was designated as an architect-educator advisor to the project.

A *first* step resulted in the designation of an Advisory Committee to assist in the development and evaluation of the project. Members included:

William Chase, Program Officer
U.S. Office of Education
National Center for
Educational Technology
Washington, D.C.

Richard Featherstone, Professor
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Chicago, Illinois

Milton Miller, Director
Educational Facilities Planning
Grand Rapids Board of Education
Grand Rapids, Michigan

Donald Leu, Dean
School of Education
San Jose State College
San Jose, California

The *second* step involved the appointment of an architectural-planning team whose primary responsibility was to study the recognized needs and propose options for solving local career

facility problems. The team included:

William E. Blurock
William Blurock and Partners
Corona Del Mar, California

C. William Brubaker
Perkins & Will Architects, Inc.
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Stan Leggett
Stanton Leggett and Associates, Inc.
Chicago, Illinois

Linn Smith
Linn Smith, Demiene, Adams, Inc.
Birmingham, Michigan

Peter Tarapata
Tarapata-MacMahon-Paulsen Corporation
Bloomfield Hills, Michigan

The *third* and *final* step in the Project involved the final editing, publication and dissemination of the project findings. This is one of a series of five publications to be released to educators, planners and architects. The series include:

Document 1 Objectives and Options by William E. Blurock
Document 2 The Process of Planning by Stanton Leggett
Document 3 Facility Options by C. William Brubaker
Document 4 Planning for Change by Peter Tarapata
Document 5 Construction Options by Linn Smith

Special acknowledgment is due Robert Pangman, State of Michigan, Department of Education, for his assistance and guidance throughout this project; to William Weisgerber, State of Michigan, Department of Education, and to Casmer Heilman, College of Education, Michigan State University, for their assistance in critiquing and editing these documents; to the Michigan Middle Cities Education Association for their review and critique of the five documents; and to the Council of Educational Facility Planners, International for the printing and dissemination of the publications.

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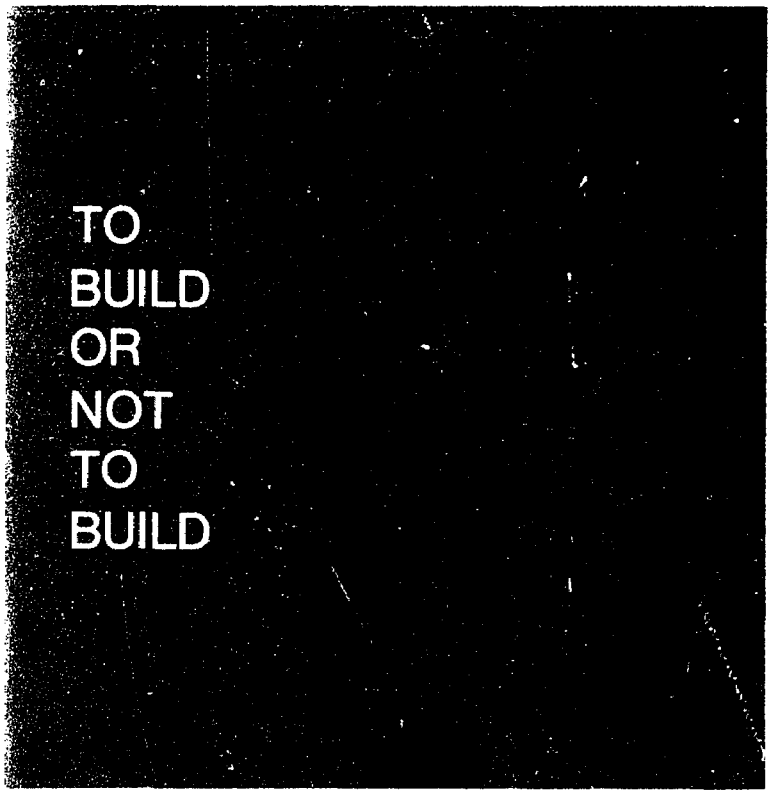


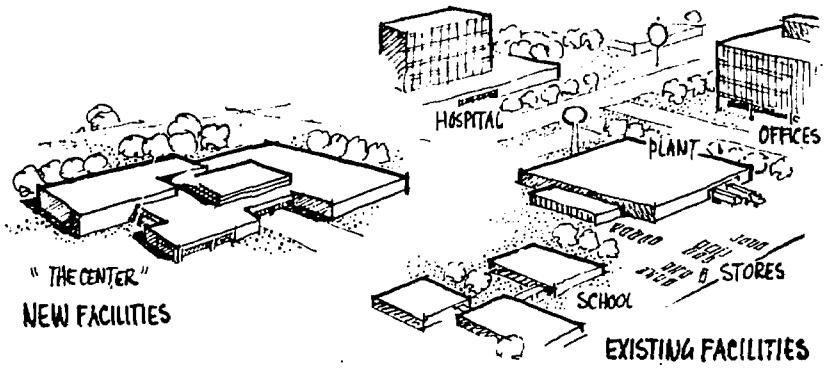
A. SOME OF THE QUESTIONS

The first question is whether to build *new* facilities for career preparation activities or to utilize *existing* facilities. The answer can be (1) all new facilities, (2) all existing facilities, or (3) both. To satisfy all needs, the answer is probably both.

If *new* facilities are deemed necessary, then the question is whether to build them as concentrated "centers" bringing together various components at common locations or to build in smaller increments at many locations, as on community college and four-year college campuses and/or high schools, or near plants, offices, hospitals and other real-world workplaces.

If *existing* facilities are to be utilized, then they must be identified. The question is whether existing educational facilities can be found (as at high schools, community colleges and state colleges, or even recycling some surplus existing elementary schools) or whether non-educational facilities can be found and utilized (as in plants, labs, offices, stores, hospitals, resorts, etc.).

Regardless, it is important to note that Michigan has already built a number of secondary Area Vocational Education Centers. They are new facilities. They are indeed "centers" which concentrate career preparation activities at campus-like locations. In Michigan, as in some other states, these centers look very much like high schools or small community colleges.



The inescapable question is generated by the very existence of such centers: *Should* career preparation activities be concentrated in centers or should they be mixed into the total community, relating education for work more closely to the real workplaces? Or are both needed?

We do have choices. We can decide. This is called planning, but a good plan is never finished. It should

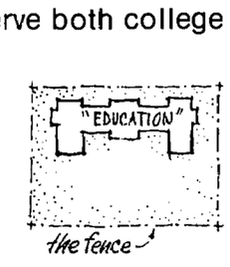
be reviewed, adapted or changed as needs change. This study is part of that continuing process involving reevaluation and redirection.

Obviously, educational philosophy and objectives will strongly influence these choices. A broad range of options can be identified, and this is the mission of this document.

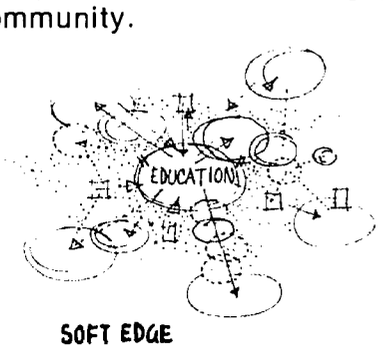
B. RECENT TRENDS IN EDUCATIONAL PHILOSOPHY INFLUENCE FACILITY PLANNING

An important recent theory says: education, at its best, is a part of life and a part of the community, not apart from life and apart from the community. The well-known Parkway School experiment in Philadelphia is an expression of this theory, as are the work-study programs, internship programs, and other ideas that soften the lines between learning and living.

Generally, the fences separating education from the other activities of life are coming down. The old school had a chain link fence around it and was locked "after-hours" keeping it apart from the community, but now the community uses school facilities and the school extends out into the community. The old campus was walled with gates maintaining a hard edge between town and gown, but now, more often, a soft edge is thought to be more desirable. Certain functions, and therefore buildings, serve both college and community.



HARD EDGE



SOFT EDGE

This mixing trend is discernible in career preparation activities. Career preparation can reach out into the community, reaching more people as students, using people as teachers, welcoming more adults to the education buildings, and extending the education process out into the other buildings of the community. Examples quickly come to mind—the training programs in hospitals, the work experience opportunities in industry, the hotel schools, and the work-study programs where students work in the real world in drafting rooms and laboratories and offices. These students are productive, earn money, and gain the satisfaction of working.

The once-cherished tidy time schedules for formal education have been challenged by many new ideas. Two decades ago, after twelve years of elementary and secondary school, most students were confronted with two choices—go to work—or go on to college (immediately, with exactly four years of undergraduate school, possibly followed by well-defined periods of graduate study). Those rigid and tidy days are gone forever. They've been superseded by new and broader options—including military service, Peace Corps, community colleges, advanced placement, work-study programs, travel abroad, alternative schools, junior achievement, opportunities to work in the real world before "completing" formal education, and a whole new attitude towards and respect for career preparation!

The world has changed. "Going to college" is no longer seen as the only answer or right answer or best answer for many youth. The priorities are being readjusted. More young people see new opportunities in getting out into the real world sooner.

The real world is the key phrase. It suggests ways of planning career preparation activities that are interesting options to earlier ways of planning, and it suggests new ways of planning facilities that are

interesting options to earlier kinds of facilities. It suggests mixing career preparation activities, and the necessary facilities, into the real world workplaces.

"Mixing" may not be the only answer. Identifiable centers or "nodes" may be valuable. Perhaps we need some places where career preparation is symbolically important—where it achieves high visibility and importance in the community—and a place where students can gather together for social intercourse.

Finally, the public and private domains cooperate more willingly, sharing programs, places and people. This is perhaps the most significant trend, and it is a trend that could have a profound effect on facilities for the career preparation.

Advisory councils composed of employees in the community can be a good method for getting cooperation from the private domain. An imaginative public relations program is essential to gain the interest and support of local employers. They must be informed (or reminded) of the educational programs that are important to their own work. Employers must be "turned on" to get real support and cooperation.

A good example is the advisory council made up of furniture manufacturers in Grand Rapids, Michigan. This group cooperates with, advises, and assists the furniture manufacturing program at the Kent Skill Center which is located in that area.

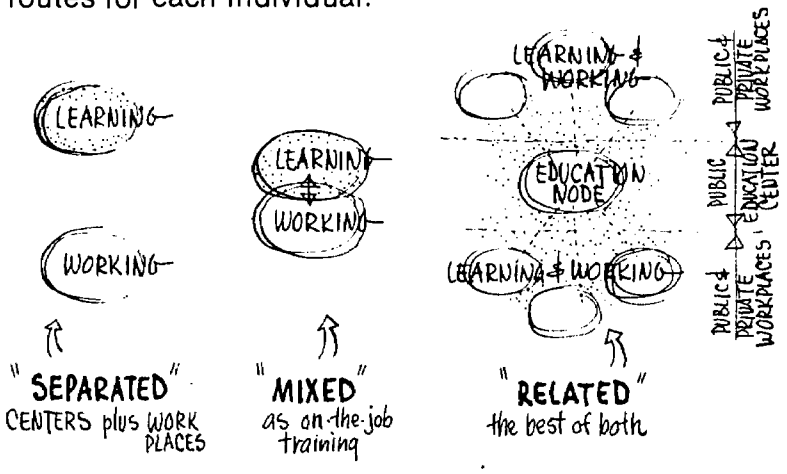
In Chicago, Jones Commercial High School, located downtown in an office-like structure on South State Street, has a very effective advisory council composed of employers in the central business district. The council cooperates with the school in running a work-study program. Students attend classes at Jones a half-day and work in commercial and government offices a half-day.

C. SOME THOUGHTS ON OPTIONS

The word option implies exercise of choice. It need not be only a one-time choice or an exclusive choice. A good management policy (i.e., good planning) is to make decisions that permit future decisions to be made. We can keep the options open and we can embrace many options. Single, final answers are suspect. Properly suspect.

Americans thrive on diversity and variety. "Multiple criteria for success" is a key to our rich and diverse society in which each individual has maximum opportunity for success. Programs must be diverse and, therefore, facilities must be diverse. Accepting a great variety of facilities will probably be better than attempting to achieve uniform standards.

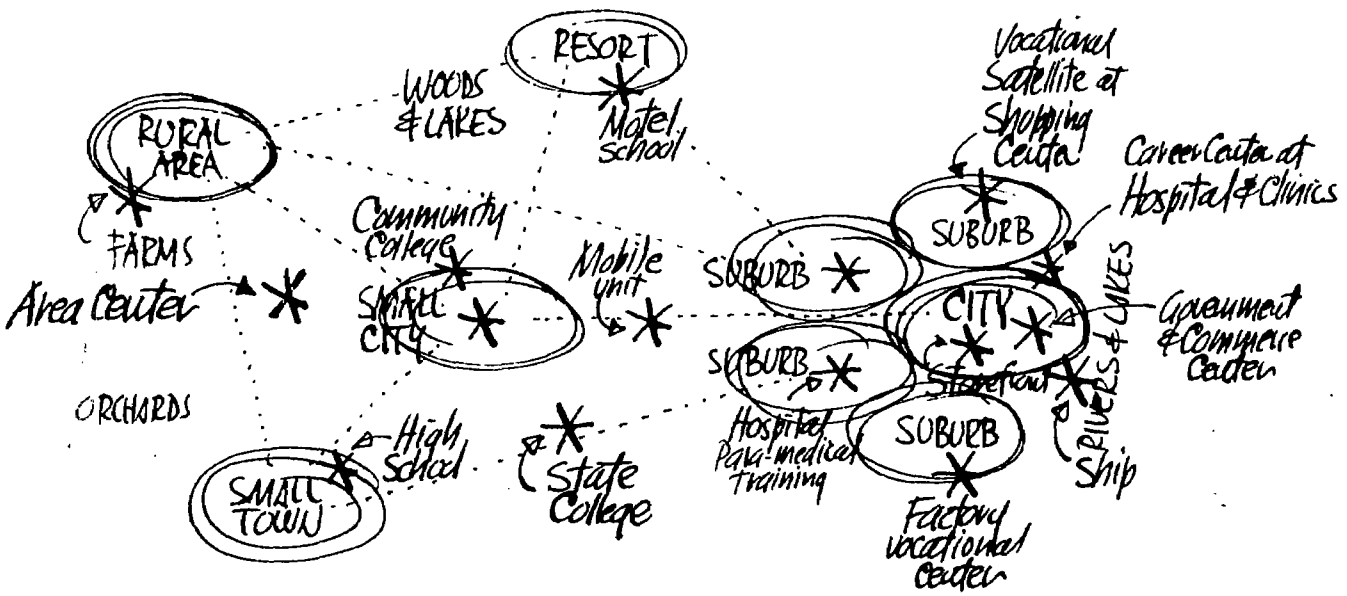
In the urban area, where large numbers of culturally and economically deprived people are concentrated (especially in the last 40 years), education needs are inevitably different than those of pleasant suburbs, and certainly different from the needs of small cities, towns and rural areas. An expert computer programmer, skilled machine tool operator or successful retailer can come from any area, but education will have to provide somewhat different routes for each individual.



The Area Vocational Center can be important where facilities in the community are not available. However, in the ghetto, the storefront may be an effective place for education for certain programs; in suburbia, the office park and research laboratory may be useful. Accessible to both worlds, the automobile plant, the medical center, and the community and state colleges may provide other opportunities most effectively. The facility implications are clear. A single answer is inadequate. We can welcome both old and new facilities, both "centralized" and mixed into the community, both elegant and informal (spontaneous and highly adaptable), both highly visible and nearly invisible.

The reason for not only accepting, but seeking, great variety in facilities is the simple fact that Michigan has a wide variety of communities: rural, urban, and suburban, industrial, agricultural and recreational, all with a diversity of wealth. In every one of these communities, citizens want better opportunities for career preparation. It is unreasonable to believe that a single solution will satisfy all of their desires and expectations.

Therefore, in considering the facilities options, we ("we" meaning planners, architects, educators, government officials, citizens and students, in concert) want to be certain that all the options are given a hearing. We want to explore many possibilities—some well-known, some new and unproven, some not yet discovered. We want to evaluate these possibilities and eventually consider them in each specific and unique locality, and then choose from the alternatives, having the advantage of knowledge and, hopefully, inspiration. We recognize the fact that the "best" facilities for career preparation activities in southwestern Michigan will not be the same as those in Upper Peninsula, and certainly not the same as the facilities appropriate for Detroit.



Another good management policy would be to offer to each individual the maximum number of options. He should be able to choose from a number of different kinds of programs, involving different kinds of facilities. He might choose the "center" where he will be in contact with various career preparation programs, or he might choose a more specialized setting where emphasis is on a particular career.

Note that private schools, especially in cities, also broaden the options. Business colleges, barber colleges, law schools, YMCA colleges, electronic schools, truck-driving schools, and dozens of other private schools offer a wide spectrum of job training opportunities. One of the options open to public education is to seek closer cooperation with these private schools.

It should be noted that coordination problems will probably increase when the range of options is increased. Fortunately, new management tools, including the computer, make such coordination practical even though it is conceivable that the cost of education might be affected. Whether costs are increased or decreased by broader options is not yet determined. Use of existing facilities may save capital costs, but administration costs might increase. The highest priority task is, of course, to determine what alternatives are most desirable.

D. NEW ATTITUDES TOWARD PLANNING AND BUILDING

ECOLOGY (". . . concerned with the interrelationship of organisms and their environments, as manifested by community development and structure . . .")

In the recent past, most new building, regardless of quality, was considered to be "progress" as was the destruction of the work of earlier generations. Now we see a new attitude emerging. The best of the old is to be preserved and new construction is to enhan environment, not damage it. Both the man-bu environment and the natural environment are which gain new attention. Quality is the watch

In the recent past, a new education facility wa designed as an entity, complete in itself on a property, and unrelated to its community. Thi changed. The design of facilities for educatio a more complex process which considers tota communities and interrelationships to man-bu natural environments.

We now recognize that education can take pla throughout the community, in old and new str in "schools" and in other buildings.

Recognition of the interrelatedness of all thing characterizes our age. The design of facilities career preparation activities must be in tune w local, state and national job opportunities, community needs and attitudes.

A number of concurrent ideas influence our at towa d building.

Conservation of resources is a growing concer Conservation of neighborhoods is a hot topic. now more often inclined to consider the existi inventory of facilities in the community and to evaluate how they can be used in the most effi manner. Recycling of existing spaces gets nev attention, and the idea is readily coupled with preservation of important and historic structur preservation of neighborhoods.

But there is a time to preserve and a time to te and re-build. Parts of Detroit, and other cities towns, are good candidates for redevelopment areas of need should be thought of as areas of opportunity. Career preparation could turn its attention to this opportunity—to serve each in better through both generation of better jobs a simply helping to create a better living environ

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In the recent past, a new education facility was often designed as an entity, complete in itself on a discrete property, and unrelated to its community. Things have changed. The design of facilities for education is now a more complex process which considers total communities and interrelationships to man-built and natural environments.

We now recognize that education can take place throughout the community, in old and new structures, in "schools" and in other buildings.

Recognition of the interrelatedness of all things characterizes our age. The design of facilities for career preparation activities must be in tune with local, state and national job opportunities, community needs and attitudes.

A number of concurrent ideas influence our attitudes toward building.

Conservation of resources is a growing concern. Conservation of neighborhoods is a hot topic. We are now more often inclined to consider the existing inventory of facilities in the community and to evaluate how they can be used in the most efficient manner. Recycling of existing spaces gets new attention, and the idea is readily coupled with preservation of important and historic structures and preservation of neighborhoods.

But there is a time to preserve and a time to tear down and re-build. Parts of Detroit, and other cities and towns, are good candidates for redevelopment. These areas of need should be thought of as areas of opportunity. Career preparation could turn its attention to this opportunity—to serve each individual better through both generation of better jobs and by simply helping to create a better living environment.

More citizens are beginning to recognize that careless new development can damage their environment, so we see increased awareness of, and demand for, good planning and high quality design.

In the decades after World War II, with rapidly expanding population and projections of endless growth, much building was based on a desire for maximum quantity at the sacrifice of quality. Now, with population growth modified and projections tempered, we can catch our breath and more carefully plan for superior environments.

Long range quality demands long range flexibility. Capital investments are for long terms. But needs change as new programs develop, so quite naturally and properly, more adaptable structures are required. New building techniques (including flexible space, movable walls, stystems design, etc.) make adaptable structures possible. A new kind of architecture is evolving in which long range needs will be accommodated more efficiently.

Concurrently, the new generation seeks improvement in the natural environment and the man-built environment, in concert.

This generates interest in city planning, in reg
planning, in the design of outdoor spaces (the
between buildings), in landscape design, and
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in Ian McHarg's book, *Design with Nature.*

The preservation of existing trees and planting
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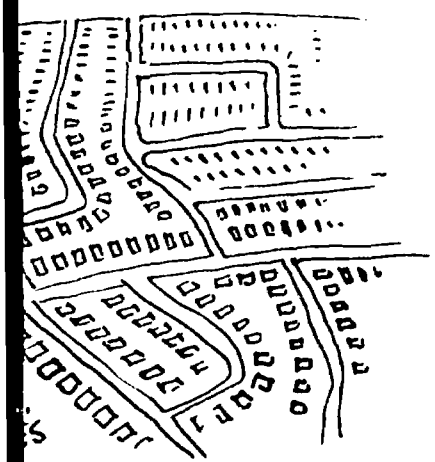

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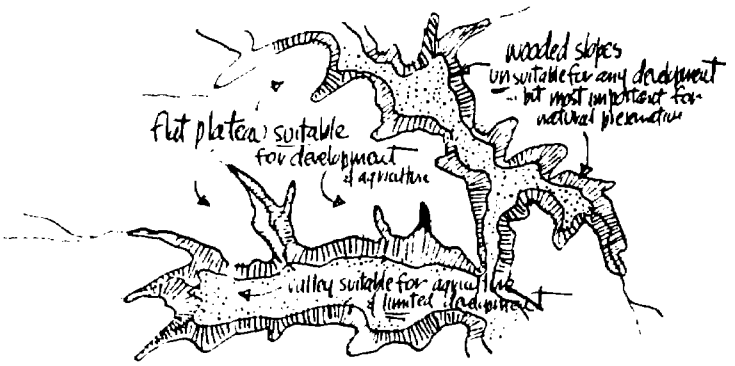


This generates interest in city planning, in regional planning, in the design of outdoor spaces (the spaces between buildings), in landscape design, and in a new attitude towards development generally, as suggested in Ian McHarg's book, *Design with Nature.*

The preservation of existing trees and planting of new trees is the responsibility of all segments of society, especially education.

The protection of meadows, wetlands, waterfronts, lakes and rivers is also of growing concern. This is most important in Michigan where a large part of the economy depends on these resources. Education has a responsibility in enhancing Michigan's identification as "The Great Lake State."

All this produces a new attitude toward planning and building. It can be summarized by saying that we must explore the alternatives to building, and when finding that new construction is proper, then plan and build in a quality manner in concert with nature. We must concurrently be sensitive to opportunities to utilize existing buildings more effectively.

Facilities for career preparation activities will therefore probably be richer in variety, more adaptable to changing needs, more responsible to the total environment, more carefully related to the special needs of each area, and will be designed considering broader community needs. Since each community is unique, the idea of establishing uniform standards, or stock plans, is unpromising.

E. THE CENTER CONCEPT

The "center" concept is the first and most obvious option to be considered. Dozens of different occupations course offerings are gathered together under a common roof.

The center concept has the advantages of special identity for concentrated career preparation activities, exposure of many occupational opportunities to anyone visiting the center, convenience in administering the program, opportunities for social activities for students, and probably efficiency and economy in operating programs.

Other advantages include ease of coordinatio program articulation and administration. Als transportation is more convenient.

However, certain disadvantages to the center must also be noted. Career preparation is set from other education, and set apart from the world" workplaces. The center is sometimes from the communities it serves. Work-study opportunities may be limited by long travel d to where the jobs are.

These disadvantages are important considera they influence generations of other alternativ

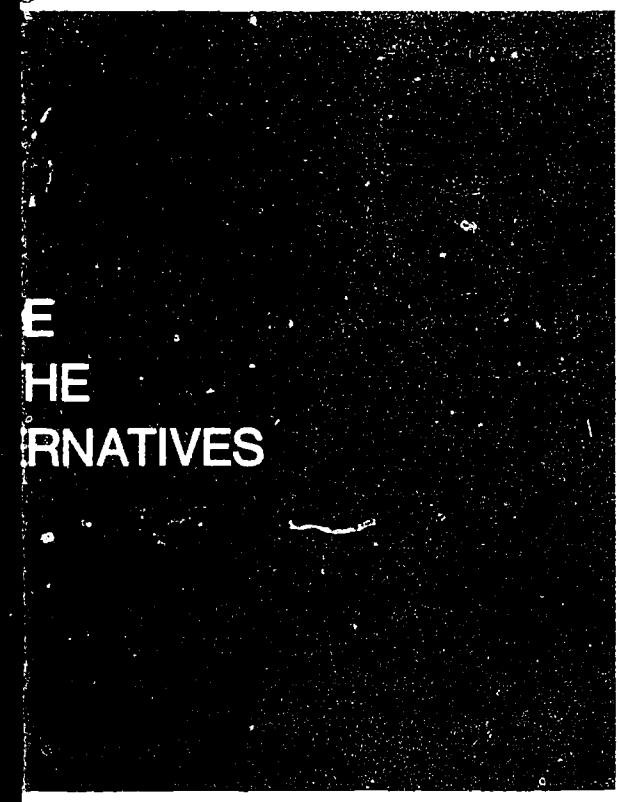
F. THE MULTI-CENTER CONCEPT

Instead of creating a single large center in an (often one county), a number of smaller cente be established, making the program multi-lo Certain programs, especially business occup could be at a downtown location. Other prog machining and fabrication, could be in an ind district. Health occupations could be related local hospital.

The idea suggests a more complex network o facilities, with less emphasis given to the "an established earlier. For example, a health occ center might serve many areas, while a down business occupations center would serve its primarily. Centers could be added (or altered closed) with less traumatic effect.

Such centers would be more specialized and than the existing comprehensive centers. The utilize both new facilities (as a new unit in an medical center) or existing spaces (as floors existing office building).

This would encourage adaptability, would rel



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Other advantages include ease of coordination, program articulation and administration. Also, bus transportation is more convenient.

However, certain disadvantages to the center concept must also be noted. Career preparation is set apart from other education, and set apart from the "real world" workplaces. The center is sometimes isolated from the communities it serves. Work-study opportunities may be limited by long travel distances to where the jobs are.

These disadvantages are important considerations, for they influence generations of other alternatives.

F. THE MULTI-CENTER CONCEPT

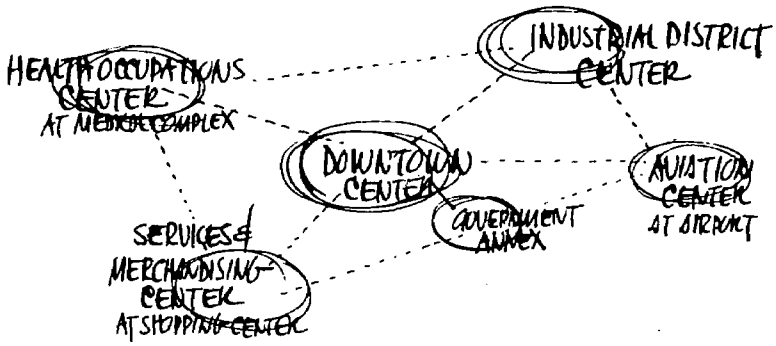
Instead of creating a single large center in an area (often one county), a number of smaller centers could be established, making the program multi-locational. Certain programs, especially business occupations, could be at a downtown location. Other programs, as machining and fabrication, could be in an industrial district. Health occupations could be related to the local hospital.

The idea suggests a more complex network of facilities, with less emphasis given to the "areas" established earlier. For example, a health occupations center might serve many areas, while a downtown business occupations center would serve its own area primarily. Centers could be added (or altered or closed) with less traumatic effect.

Such centers would be more specialized and smaller than the existing comprehensive centers. They would utilize both new facilities (as a new unit in an existing medical center) or existing spaces (as floors of an existing office building).

This would encourage adaptability, would relate

education to workplaces, offer more chances for work-study, and make it more convenient for practitioners to visit the centers.



G. NUCLEUS AND SATELLITES

Supplementing the educational programs at the center, the nucleus of a multi-location system, many related satellites can be established in the community workplaces—in the offices, factories, hospitals, stores, shopping centers, etc.

The idea implies use of existing spaces, probably leased, in public and private properties, where part of the career preparation activities occur, and strongly encourages work-study programs. Leasing of space has many advantages, since great flexibility is gained by making shorter term commitments for space. Also, note that currently, surplus space does exist in many parts of most cities and towns.

Satellites can be more or less permanent, can change from time to time, can be easily established as new opportunities arise. They can be seasonal (as for the resort business), mobile (as on ships), at distant locations (as at a nuclear power plant), in museums (as Greenfield Village), in factories (as an automobile plant), at farms, in forests and at universities.

The modern shopping mall
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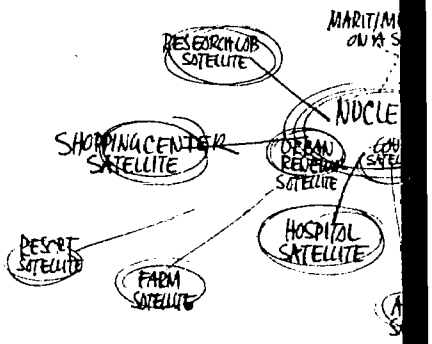

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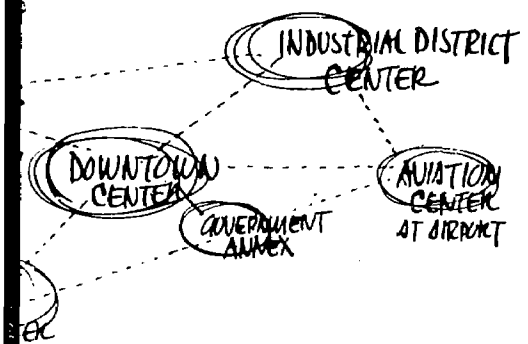

D SATELLITES

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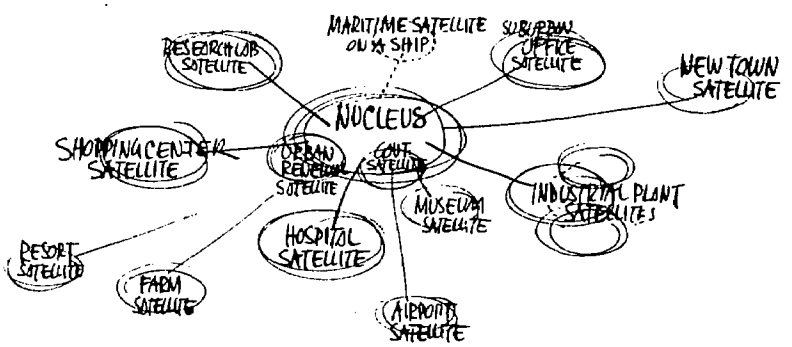
ge), in factories (as an automobile
f and at universities.

The modern shopping mall presents an exceptionally good opportunity for a satellite, specializing in marketing and service. It should be a pleasure to "go to school" in the charged environment of the busy shopping center—where the action—and the work-study opportunities would be great. Note that the Ingham Intermediate District of Mason, Michigan, runs its distributive education program in Lansing's Meridan Mall shopping center in stores with the cooperation of store managers.

Construction of a New Town, or a large "Planned Unit Development," can provide a chance to establish a construction trades satellite, along with programs in maintenance, drafting, landscaping, marketing, banking, insurance, ecology, services and transportation. Here is an unrealized opportunity for an imaginative developer working with educators.



That idea can be taken one step further. Why not design a New Town with career education as a major form generator? The career preparation nucleus should be a key component in the New Town hub, and satellites should be planned as a part of new industries, medical centers, office complexes, etc.

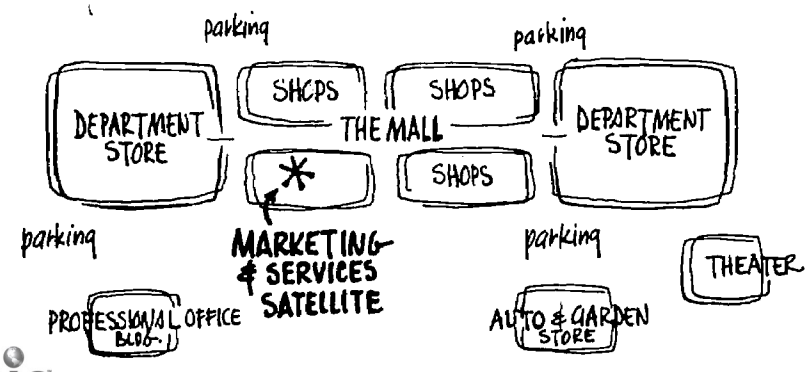
Urban renewal, generally, in cities should generate satellites where students can have direct involvement in the broad problems and opportunities of urban

redevelopment. Note that in many cities, neighborhood planning offices have already been established (usually as a part of Model Cities Programs) and these can be the starting places for career preparation satellites.

A new industrial park can have a technical education satellite as one of its components which serves the park, not unlike its electrical system serves power or its road system serves distribution needs.

Large existing industrial plants can house satellites—spaces leased to the local career preparation nucleus—for programs in production, shipping, purchasing, etc.,—creating learning environments "in context."

In this nucleus-and-satellites concept, students spend part-time at the appropriate satellite (which might change after a period) and part-time at the career preparation nucleus or center, where students of many varied interests gather together for education, recreation, cultural and social reasons. The identifiable "node" for programs continues to exist, but great flexibility in programming is gained and much of the educational experience occurs in the workplaces of the community.

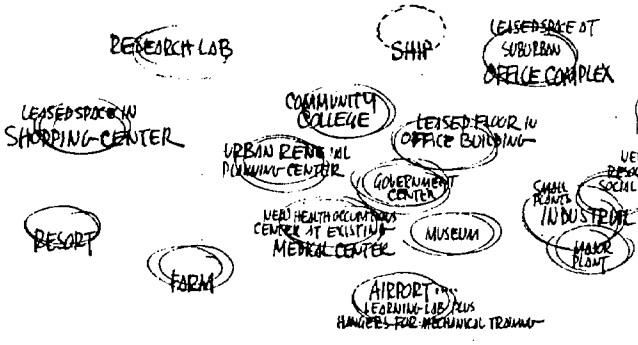


H. TOTAL INTEGRATION WITH THE COMM

This concept takes the nucleus-and-satellite ic step further, totally integrating the education with the community. The "center" disappears of all activities occurring in other facilities of t community, somewhat like the Philadelphia P School example, or the experimental University-Without-Walls ideas.

Existing structures are the prime locale for the program. Living and learning become one. Concurrently, the existing high schools, comm colleges, four-year colleges, and universities b career preparation facilities serving all citizens including those pursuing vocational-technical education programs. Career preparation activi therefore integrated with education generally, apart from it.

New construction, when and if required, occur relatively small increments where the action is concentrated centers). Recycling of some exis space in other community facilities is an impo consideration with education utilizing the low- existing space which is available in historic lar buildings—giving a new time dimension to par the education process.



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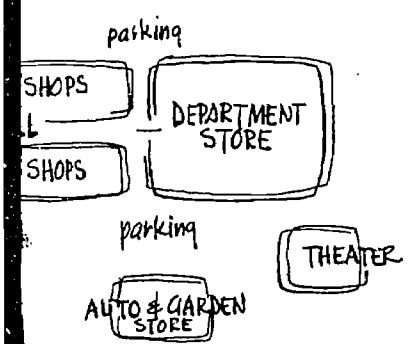
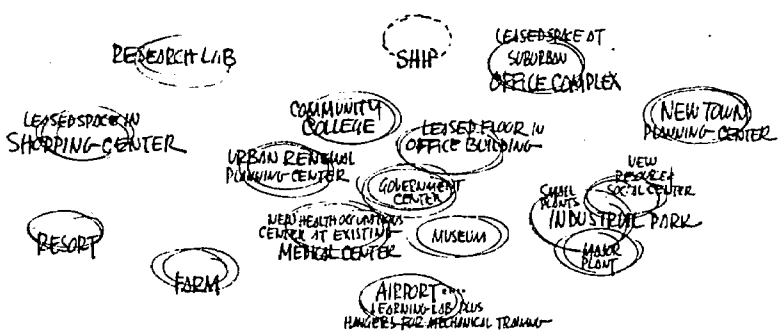
H. TOTAL INTEGRATION WITH THE COMMUNITY

This concept takes the nucleus-and-satellite idea one step further, totally integrating the education process with the community. The "center" disappears in favor of all activities occurring in other facilities of the community, somewhat like the Philadelphia Parkway School example, or the experimental University-Without-Walls ideas.

Existing structures are the prime locale for the program. Living and learning become one. Concurrently, the existing high schools, community colleges, four-year colleges, and universities become career preparation facilities serving all citizens, including those pursuing vocational-technical education programs. Career preparation activities are therefore integrated with education generally, not set apart from it.

New construction, when and if required, occurs in relatively small increments where the action is (not at concentrated centers). Recycling of some existing space in other community facilities is an important consideration with education utilizing the low-cost existing space which is available in historic landmark buildings—giving a new time dimension to parts of the education process.





"Total integration" depends upon a broad commitment by the community, especially by other schools and colleges, business and industry. First, an inventory of possible places should be prepared. A truly imaginative and innovative program is essential. Management problems will be quite different from management of a center. Regardless of problems, this alternative will probably command more attention in the future.

One example of total integration of career preparation with the community is at Santa Ana, California, in the Los Angeles area, where 4,000 students are placed in local industry for their vocational education. The program has only two full-time coordinators. With little administrative cost, no facility costs and no transportation costs, the program is, of course, economical but, so far, the quality of the experience is not known.

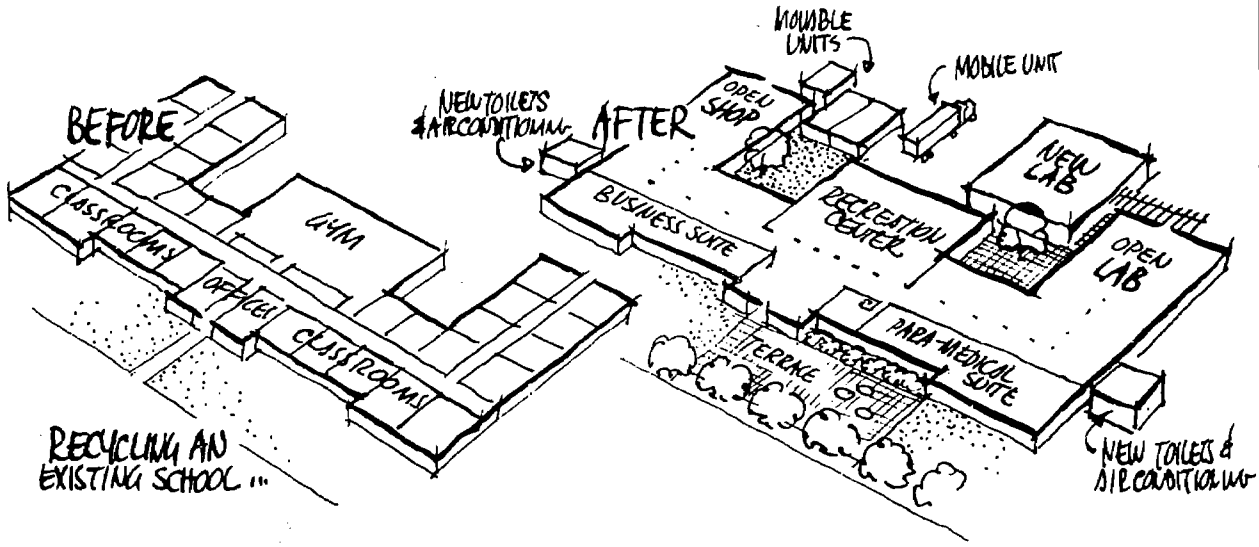
The advantages and disadvantages of the concept are generally reversed at this end of the options spectrum when making comparison with the center concept.

I. RECYCLING EXISTING EDUCATIO

To satisfy certain space needs in som another option involves use of existin college buildings. With growing dema preparation activities plus decline in o enrollments, some surplus school spa found to accommodate career program

The limitations (functionally, aesthetic symbolically) of some existing educat are obvious and inadequate structures wrecking ball. Others have possibilitie frame and enclosing walls may be ade mechanical and electrical utilities may upgraded. Certain kinds of existing str engulfed with new construction.

Not only the internal learning environm external environment should be evalua neighborhood is desirable, preservatio appropriate. If the neighborhood is no imaginative redevelopment of the neig be possible—to give the place new life image."



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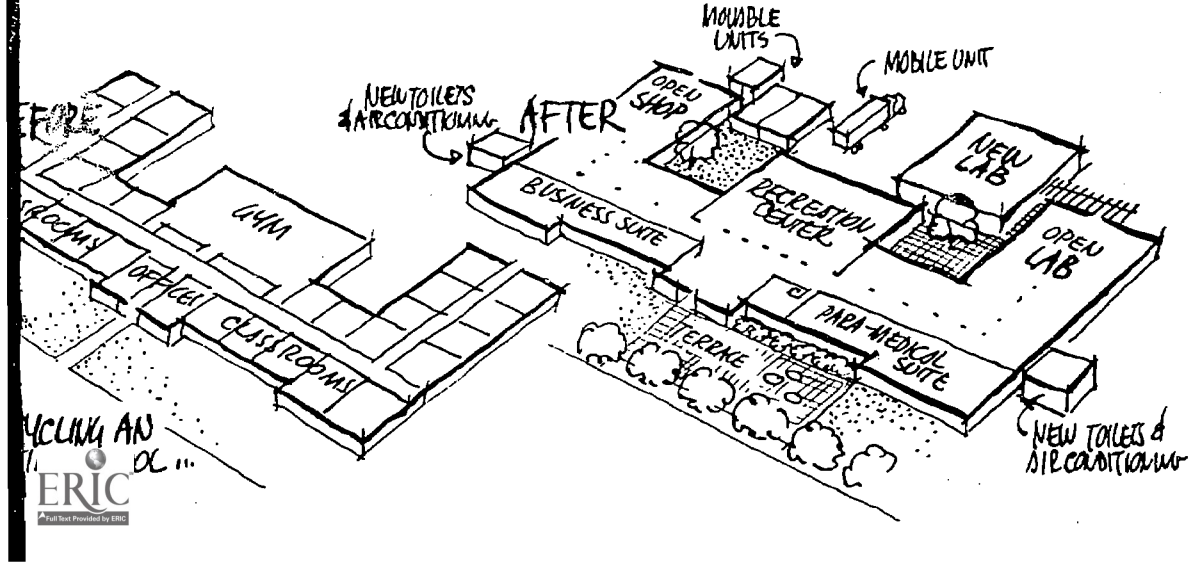
I. RECYCLING EXISTING EDUCATIONAL FACILITIES

To satisfy certain space needs in some communities, another option involves use of existing school and/or college buildings. With growing demand for career preparation activities plus decline in other school enrollments, some surplus school space might be found to accommodate career programs.

The limitations (functionally, aesthetically and symbolically) of some existing education buildings are obvious and inadequate structures deserve the wrecking ball. Others have possibilities; the structural frame and enclosing walls may be adequate, but mechanical and electrical utilities may have to be upgraded. Certain kinds of existing structures can be engulfed with new construction.

Not only the internal learning environment, but the external environment should be evaluated. If the neighborhood is desirable, preservation will be appropriate. If the neighborhood is not desirable, imaginative redevelopment of the neighborhood may be possible—to give the place new life—"a new image."



J. RECYCLING EXISTING NON-EDUCATIONAL FACILITIES

Non-education structures can be considered for new education uses.

In downtown Dallas, Texas, the Dallas Community College System purchased and remodelled an old seven-story department store (especially flexible loft space) to create handsome "El Centro" College. It is a convincing demonstration of relating education closely to the other activities of the community, mixing space for education into the central business district, while creating a highly visible center.

Factories, warehouses, office buildings, supermarkets and railroad stations have been successfully converted into educational facilities. Educational Facilities Laboratories, Inc. has published a number of useful studies on this topic.

The advantages of recycling an existing building can include:

1. Cost savings if the building is in good condition.
2. Time savings.
3. Gaining excellent location.
4. Preservation of an historic landmark.
5. Space with character.
6. Integration with the community.

The disadvantages of recycling an existing building can include:

1. Extra cost if the building is in poor condition.
2. Poor environment if the building has such limitations.
3. Lack of long range flexibility if the building is too rigid.
4. Disagreeable or inconvenient neighborhood.

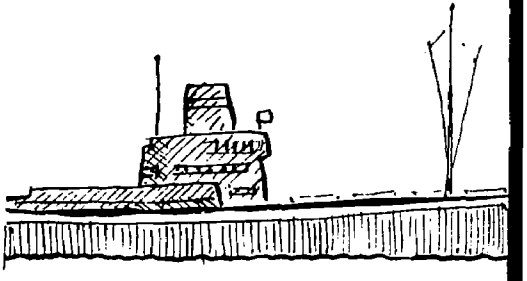
It should be noted that these last two options — recycling either educational or non-educational buildings—can be applied to any of the previous concepts, from the "cen nucleus-and-satellite idea, and to tot with the community.

K. MOBILE FACILITIES

Until recently, we usually assumed e place in buildings—on firm foundati sites.

There were some exceptions. In New 19th century, the schoolship St. Mar floating vocational school for young go to sea. New York City continued with ships tied up at docks in the cit the Navy and Coast Guard use ships education; and universities use boat marine biology, weather, oil explorat and other studies. A number of conv ships serve as floating colleges.

Career preparation in Michigan—the State—can take advantage of floatin Detroit, Port Huron, Bay City, Chebo City, Manistee, Ludington, Muskego Benton Harbor, Sault Ste. Marie, Esc Menominee, Marquette, and Houghto have working harbors. Boats, ships a provide space for commerce and resc can provide movable facilities for oth



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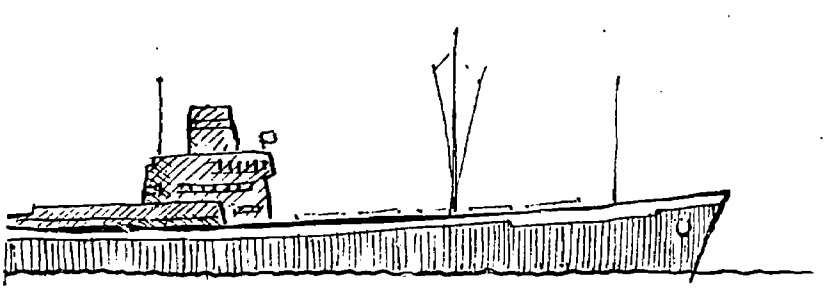
K. MOBILE FACILITIES

Until recently, we usually assumed education took place in buildings—on firm foundations on fixed sites.

There were some exceptions. In New York City, in the 19th century, the schoolship St. Mary served as a floating vocational school for young men who would go to sea. New York City continued this tradition, with ships tied up at docks in the city. And, of course, the Navy and Coast Guard use ships extensively for education; and universities use boats and ships for marine biology, weather, oil exploration, ecology, and other studies. A number of converted passenger ships serve as floating colleges.

Career preparation in Michigan—the Great Lake State—can take advantage of floating facilities. Detroit, Port Huron, Bay City, Cheboygan, Traverse City, Manistee, Ludington, Muskegon, St. Joseph-Benton Harbor, Sault Ste. Marie, Escanaba, Menominee, Marquette, and Houghton-Hancock all have working harbors. Boats, ships and barges can provide space for commerce and resort education, and can provide movable facilities for other programs.



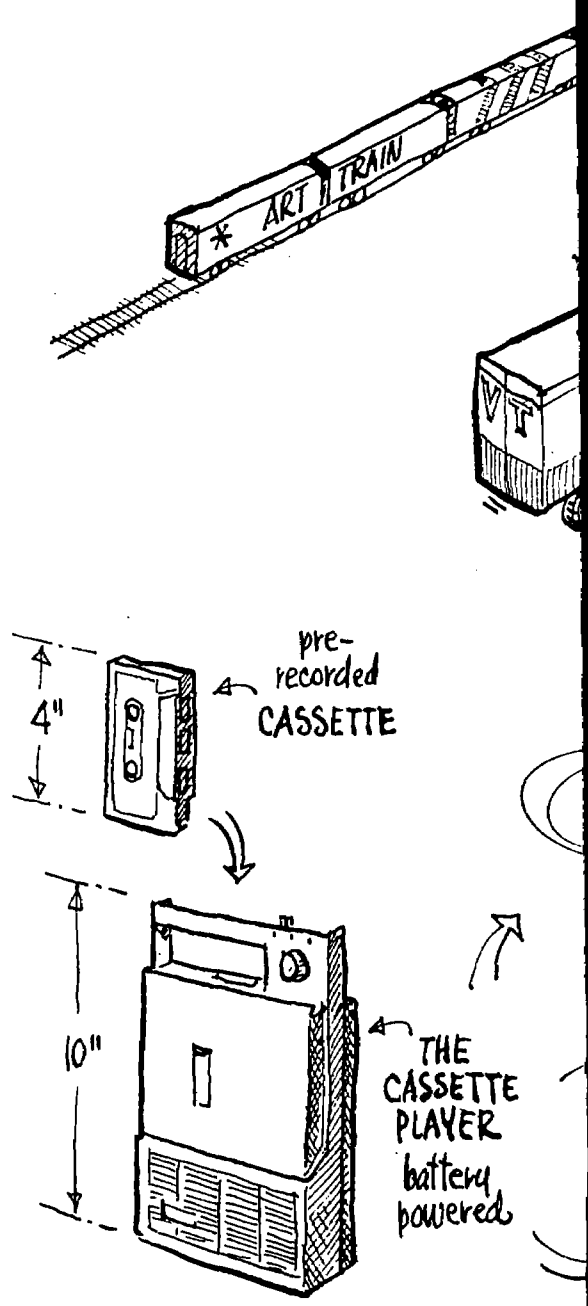
Trains and railroad tracks are an under-utilized resource in Michigan, and an untapped idea for mobile education facilities. Railroad cars can be equipped for special programs and moved from town to town to give access to expensive laboratories and shops which many places cannot otherwise hope to enjoy. This idea was used recently by the Michigan Council for the Arts, which created a multi-car "Art Train" skillfully designed with sophisticated audio-visual equipment, exhibits and working artists' studios. This train visited all parts of the state, on a schedule, providing new experiences for thousands of people.

Busses and trucks can be useful, too. Michigan is already using "Mobile Guidance Units" to encourage career planning. Many truck trailers have been designed and equipped to create mobile demonstrations, exhibitions and laboratories. Costly and highly specialized electronic, machine, engine, computer, medical, dental, and other laboratory-workshops can be created on wheels and moved to various communities.

The Gogebic-Ontonagon, Charlevoix-Emmet and Eastern Upper Peninsula Intermediate Districts have used mobile guidance units, and the Dickinson-Iron District has used a mobile graphic arts lab.

Where areas are sparsely populated, mobile units may have advantages, but disadvantages should be identified too: (1) scheduling and continuity problems, (2) joint administration and ownership problems, (3) possible loss of independence, and (4) some state law and code problems.

Another mobility idea should be noted at this point. The cassette is a marvelous invention—economical and extremely mobile. Educational programs are now produced and sold to businessmen, scientists, doctors, bankers, etc., who listen to them while they drive to work or on trips—using cheap, lightweight



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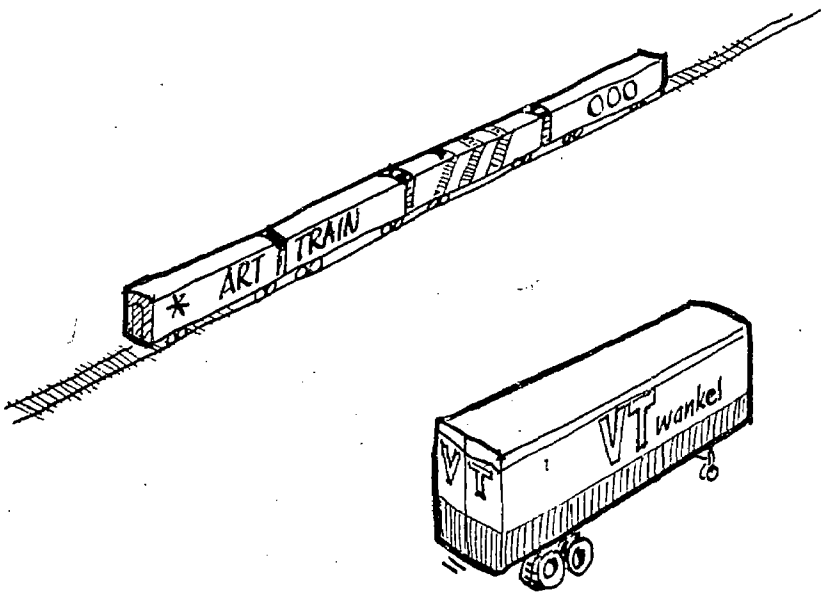
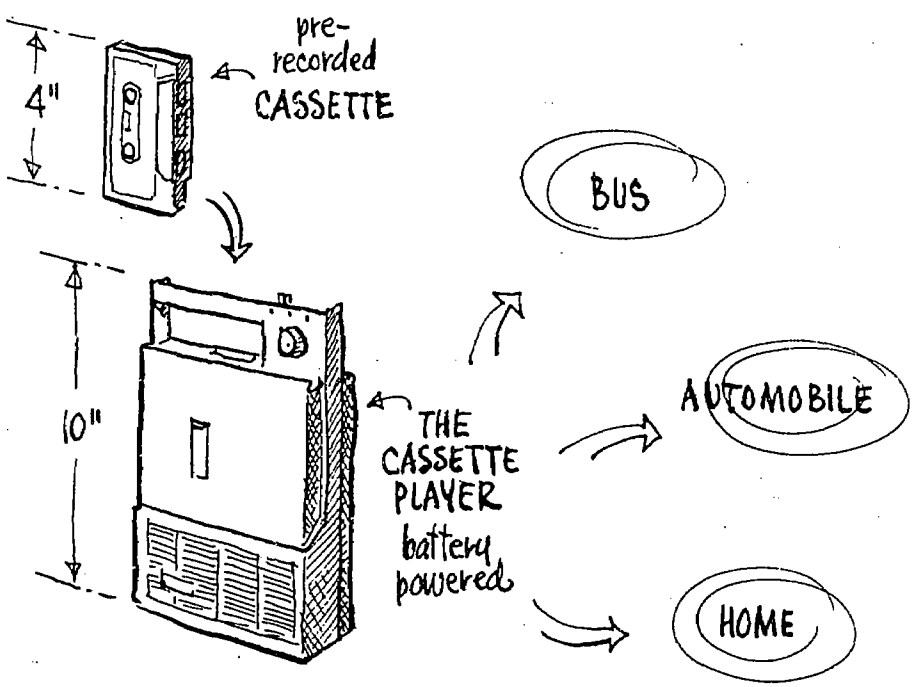




playback units. The idea can be applied to career preparation. Whether travelling by bus or automobile, students can listen to pre-recorded cassettes. And, of course, they can be used at home.

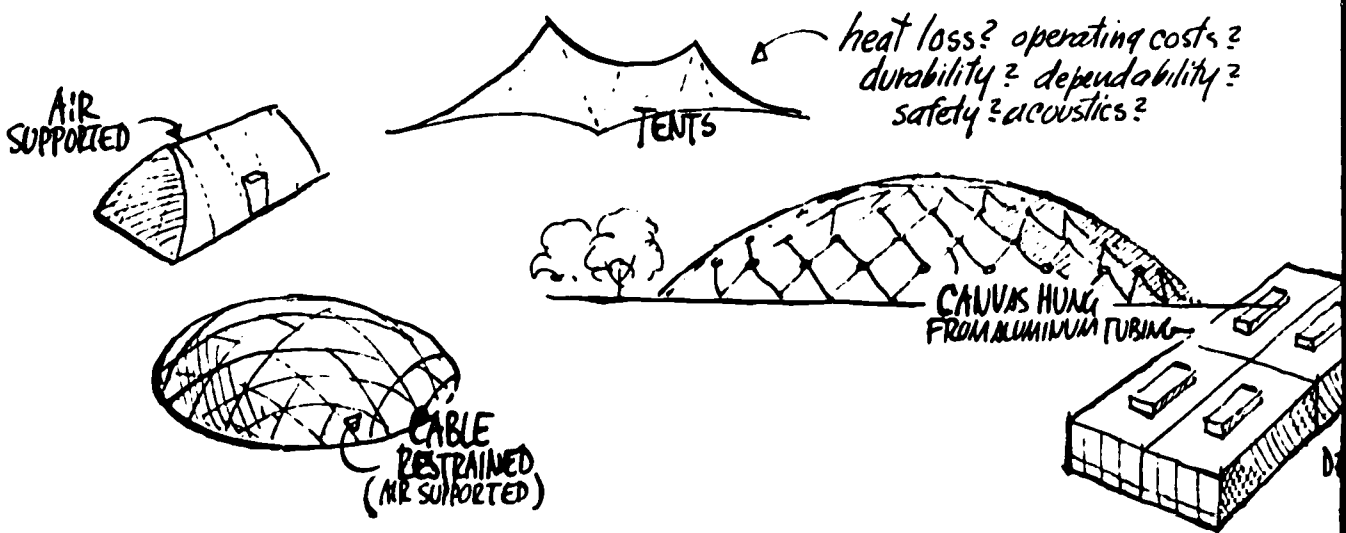
Manistique High School used an "audio bus" for transporting students travelling long distances to school. The idea has advantages when travelling distances over 30 miles or more. If we insist on expanding the amount of time spent in transportation, then it will be appropriate to create new learning systems combining transportation and the use of new media.

L. MOVABLE STRUCTURES

Finally, structures can now be more mobile than ever before. Tents, air-supported structures, domes, trailer-like units and demountable buildings are rather suddenly a part of our world.

Industry uses air-supported canvas or plastic film "bubbles" or cable-restrained low domes for warehousing—hotels and clubs and scho for sheltering swimming pools and tenni U.S. pavilion at the Osaka World's Fair w low-profile, cable-restrained, air-support and Antioch College proposes an entire s under a roof membrane at Columbia, Ma most interesting structures at Transpo at Airport, in 1972, were domes made of alu tubing from which canvas was hung. For movable programs, such structures will b career preparation.

For longer term facilities, but still movab two, demountable buildings assembled i from a kit of parts should be considered another option. In the past, a major cons utility connections—water supply, sewer electricity. But now, we see new interest systems" in which a building, in the futu recycle its water, burn its wastes to creat have self-contained systems generally.



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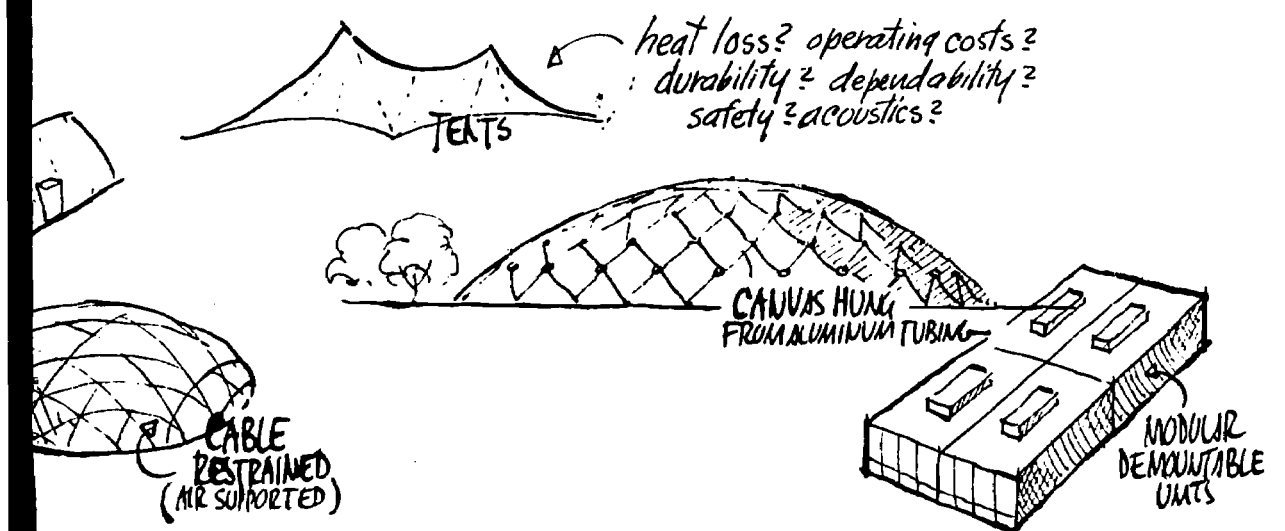
For longer term facilities, but still movable in a year or two, demountable buildings assembled in the field from a kit of parts should be considered as yet another option. In the past, a major constraint was utility connections—water supply, sewers, gas and electricity. But now, we see new interest in "closed systems" in which a building, in the future, will recycle its water, burn its wastes to create power, and have self-contained systems generally.



M. SIMULATION

At Indiana State University in Terre Haute, Dr. Lewis Yoho, Dean of the School of Technology, and his associates are developing an interesting alternative for career preparation.

Using an old, two-story Chevrolet garage with a flexible column-free upper floor, they have students simulate real-world planning, production and entrepreneurship.

In the center of the column-free loft space, students and faculty set up production lines to produce products they have designed. We can call this the "simulation arena"; it gives students hands-on experience in production (with related planning, design, purchasing, scheduling, economics, packaging, sales, etc.).

Surrounding the simulation arena are "skills area" for instruction in special tools and techniques, research and development, personnel, modelmaking, communications, tools, storage and group assembly.

This is "SIMCO" which means Simulated Industrial Manufacturing Company. New products are planned and produced by students. It is run concurrently with "CEE" which stands for Continuum Educational Enterprises. Both are an expression of Dr. Yoho's theories about learning and about work.

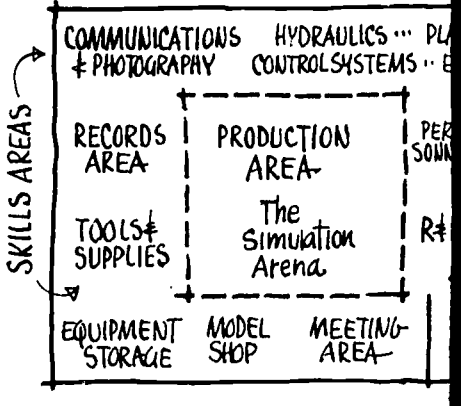
Dr. Yoho points out that we are experiencing a "Third Revolution in Work." (The first was the industrial revolution with the coming of the steam engine. The second was the development of mass production. Both were economic in nature, with man subordinated.) This third revolution will see adjustment of the work environment to better satisfy human needs. This new human commitment will produce economic values as a by-product.

With this goal in mind, Dr. Yoho has developed an "Orchestrated Systems Approach" includes his SIMCO and CEE progr is treated as a creator. He studies products (and a work environment) needs, and simulates production o

The program is future-oriented. "In assessing the past (i.e., recognizin lines, and researching the state-of important, but a higher level of lear "creatorship" or having an impact o evaluating, challenging, recommen designing).

Other examples of simulation exist Denver, Colorado, at United Air Lin Center, future pilots get some of th flight simulators which include all instruments of a modern jet transp cockpits with runway and airport vi ahead. This is a more sophisticate common driver training equipment

The idea has good potential for pro experience short of the actual work many fields. For example, at the N model office laboratory is part of th education area.



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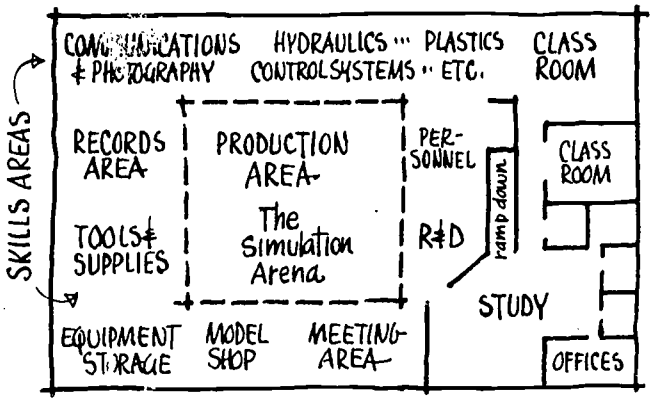
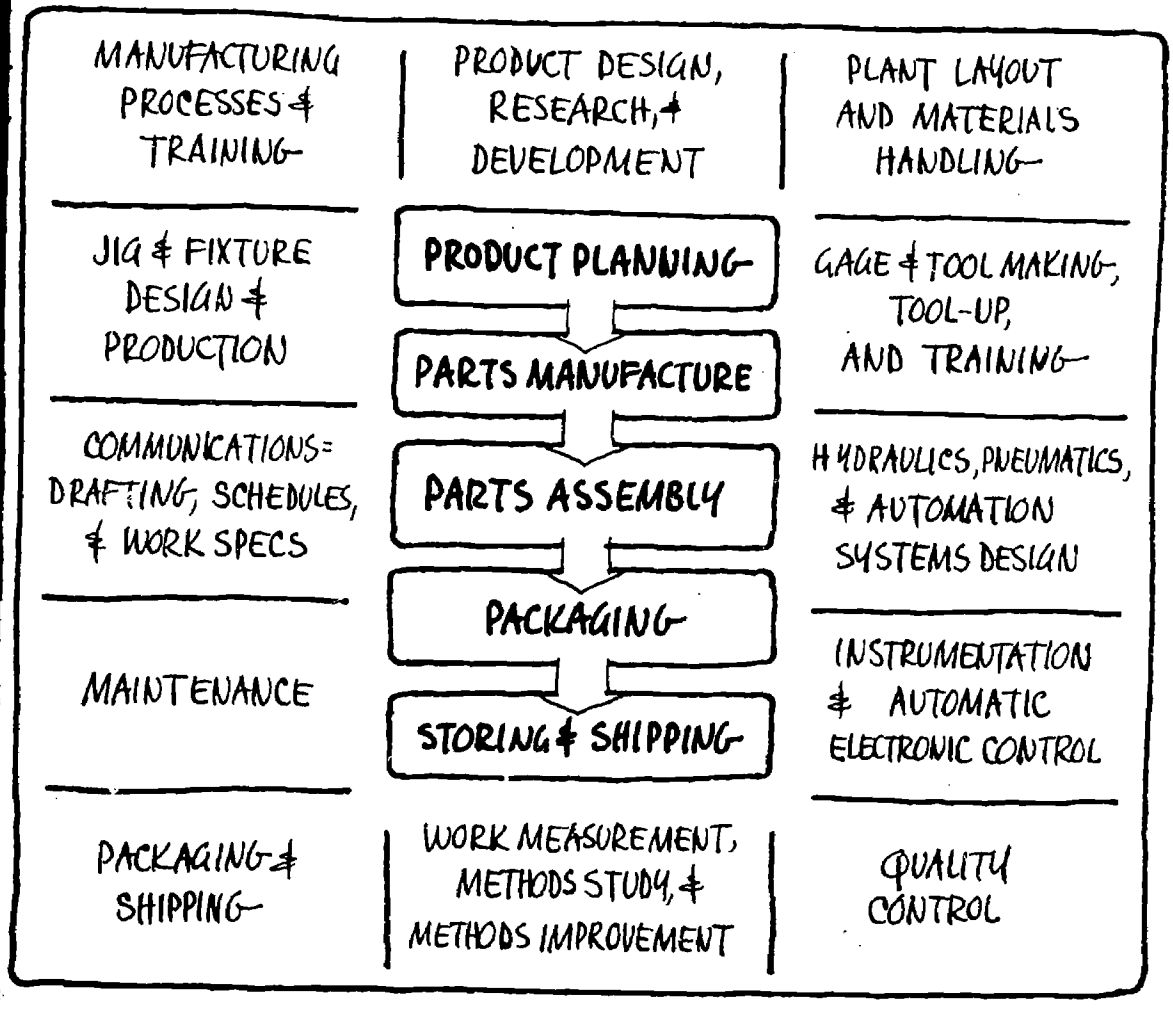
The program is future-oriented. "Inheritance" or assessing the past (i.e., recognizing historic trend lines, and researching the state-of-the-act) is important, but a higher level of learning concerns "creatorship" or having an impact on the future, (i.e., evaluating, challenging, recommending change and designing).

Other examples of simulation exist. For example, in Denver, Colorado, at United Air Lines' Flight Training Center, future pilots get some of their training in flight simulators which include all the controls and instruments of a modern jet transport in realistic cockpits with runway and airport views projected ahead. This is a more sophisticated application of the common driver training equipment in high schools.

The idea has good potential for providing "hands-on" experience short of the actual work environment in many fields. For example, at the Newaygo Center, a model office laboratory is part of the business education area.



ORCHESTRATED SYSTEMS APPROACH TO LEARNING— CONSUMER MANUFACTURE EXAMPLE—



CENTRAL SIMULATION ARENA SURROUNDED BY SKILLS AREAS

FROM "THE ORCHESTRATED SYSTEMS APPROACH TO INDUSTRIAL EDUCATION, BY L.W. YOHO SCHOOL OF TECHNOLOGY, INDIANA STATE UNIVERSITY

N. ELECTRONIC EXTENSIONS OF EDUCATION INTO WORKPLACES

A further development of the options identified in "H" above (TOTAL INTEGRATION WITH THE COMMUNITY), electronics may yet have an important impact on career preparation.

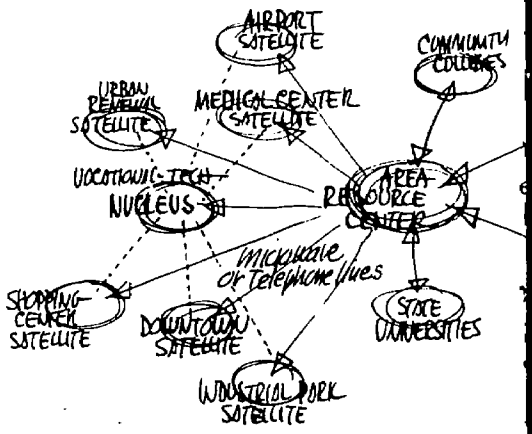
"Learning" has, in recent decades, usually been separate from "working." However, as we have noted, there is substantial argument for integrating the two activities, making education more relevant, and tempering working with continuing education.

Electronics (extensions of man) are seen by many (especially since Marshall McLuhan wrote the popular *Understanding Media* in 1964) as a tool for this integration. The New Media is here to stay.

Instruction, the enthusiasts predict, will be transmitted from a central resource center to the entire community, including the many workplaces. We will utilize television, computers, telephone lines and radio waves, remote printers, etc., to transmit and make audible and/or visible much of the necessary instruction for education.

The "student", almost indiscernible from his "working" associates (indiscernible since they will be continuing their education while working), will gain much of his education in the office, the plant, the hospital, the laboratory, the farm, the store or the resort. There he will enjoy direct access, via electronics, to greater learning resources of the community, state and nation. This will truly be independent study.

Too far out? Remember the powerful effect television has already had upon millions of people.



O. USING THE NEW MEDIA

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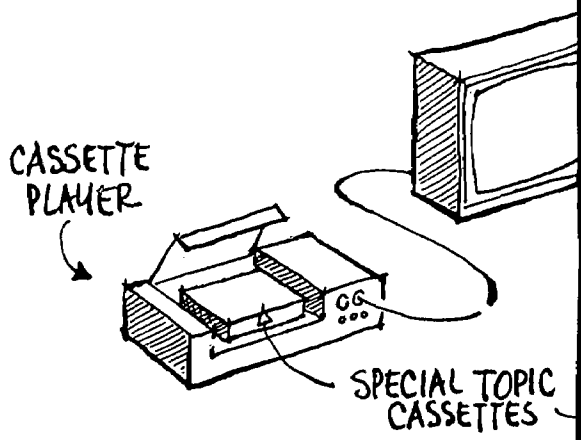
The pre-recorded video-tape cassettes purchased, borrowed from libraries or the local institution, either by staff or



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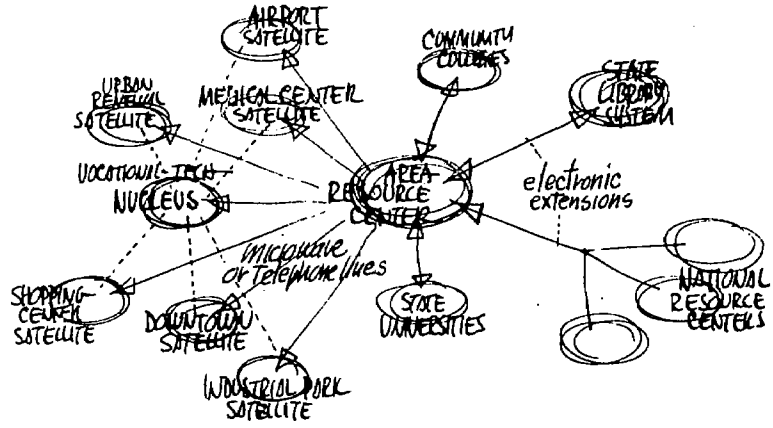
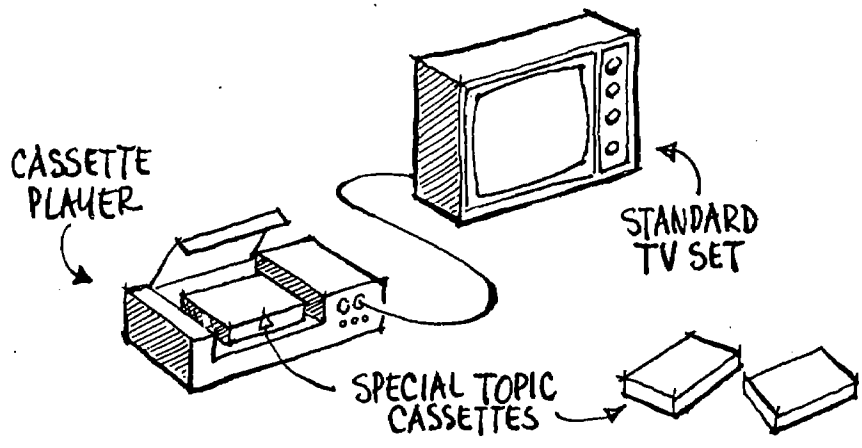


O. USING THE NEW MEDIA

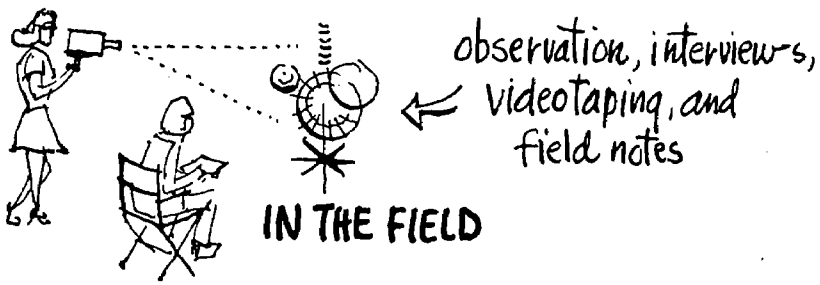
A number of examples can be cited to show how the new media can be used now for career preparation.

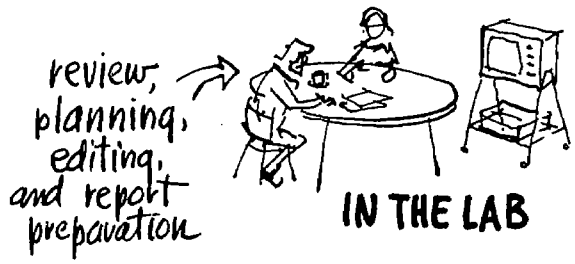
Instruction from pre-recorded video-tape cassettes is probably the most rapidly developing example. The student simply inserts a special topic cassette into a cassette player which is connected to a standard television set.

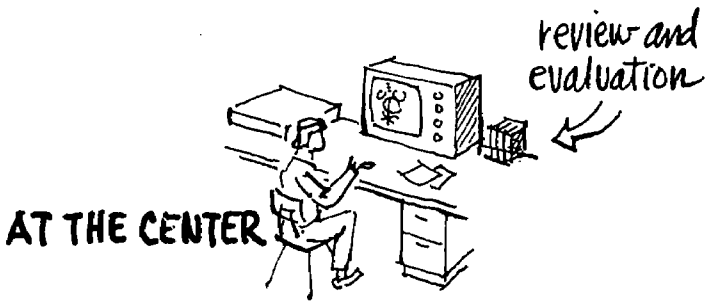
The pre-recorded video-tape cassettes can be purchased, borrowed from libraries or prepared by the local institution, either by staff or by students.



Preparation of the video-tape cassettes is becoming more economical, dependable, and therefore common. Lightweight television cameras can be used in the studio, the laboratory, the shop and in the field. Students can video-tape their activities, processes, experiments, work, trips, interviews, etc. Faculty (and other students) can play the tapes to review, evaluate and gain information.







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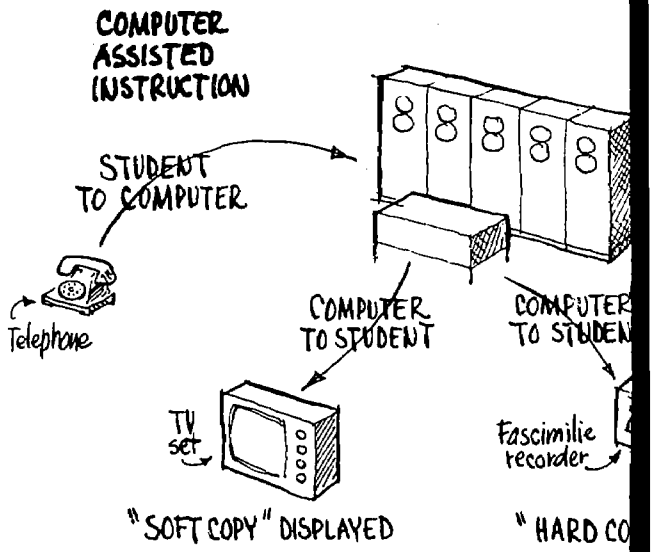

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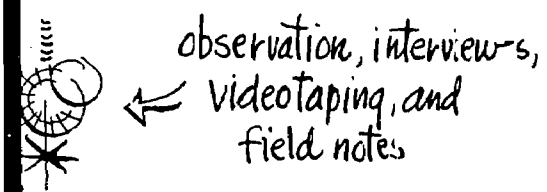
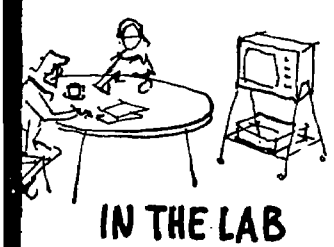
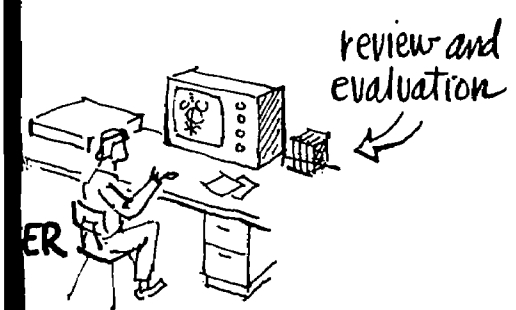


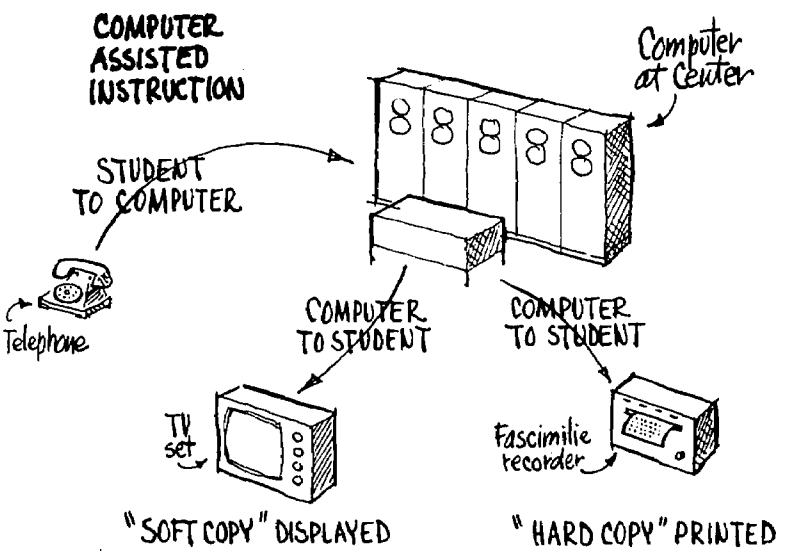




Cable television is expected to become common in most communities, tremendously increasing the number of channels for programs, and many of these new channels will probably be utilized for educational programs. Video-tapes will be useful not only on an individual basis, but will be "broadcast" using cable television channels. Therefore, learning to use video-tape equipment now becomes a most useful skill, not only for education in many programs, but also for career opportunities in the media field.

Television has other potentials for learning.

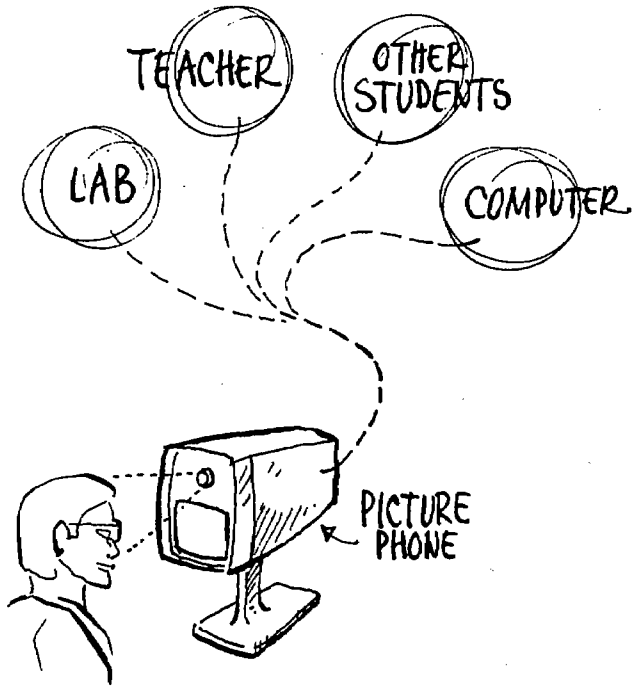
Computer-assisted-instruction (CAI) has many advocates. One proposed system links telephones and television sets to a central computer at a resource center. The student uses the telephone to call the computer, requesting a specific program. The computer responds by sending the requested audio and visual program to the student via cable to his own television set. This CAI system permits



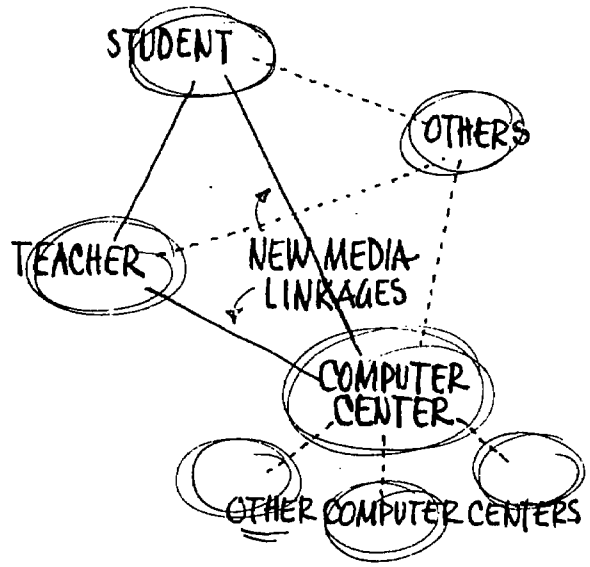
innumerable two-way communications between many individuals (whenever they wish and wherever they are) and the computer.

In the above example, information is displayed on the television tube as "soft copy" (which is impermanent). If, however, permanent or "hard copy" information is desired, then the computer (advocates predict) will send information to a facsimile recorder which will print-out the data on paper at the point of use.

Two-way communications may also be possible with the picture-phone. Students in labs, shops, studios, plants, stores, hospitals, etc., or even at home, may be able to communicate with sight and sound by dialing directly to teachers, to other students, to other nearby community facilities, or to distant places, or to



TWO-WAY COMMUNICATION



MULTI-WAY COMMUNICATION

computers. The service is not yet generally available and is expensive, but it does give us a glimpse into the future.

Finally, one can visualize a three-way (or multi-way) communication system in which future picture-phones, television equipment, facsimile recorders, and other devices link the individual student to other students, teachers, workplaces and computer centers simultaneously—creating audio-visual "conference calls" to gain access to widespread resources and people (without using wheels and gasoline!).

P. DAMN THE OPTIONS: FULL SPEED AHEAD!

We have identified some of the alternatives for career preparation facilities.

Which is the "best" option?

We don't know—and won't know.

We can only say that the options should be kept open, to encourage new ideas and future development. Diversity and variety in educational opportunities should be welcomed by creating a wide variety of educational facilities.

Michigan can't "wait until all the evidence is in." It will never be. Needs will change; priorities will change; expectations will change.

Meanwhile, the immediate need is great.

Michigan should continue this program, but broaden the scope of career preparation to include other alternatives, responding to unique local needs.

In addition to career centers, the multi-center concept, and the nucleus-and-satellites concept should be used, and education should frequently be integrated more closely with the community. Simulation techniques should be utilized. Existing buildings should sometimes be recycled. Floating schools, schools-on-rails and schools-on-tires should be developed. Movable structures should be used sometimes. Permanent structures should be more flexible (the subject of the next section). Electronics—and the new media—should be utilized.

In short, Michigan should offer its students multiple criteria for success.