

EDUCATING HIGH SCHOOL STUDENTS
ABOUT THEIR URBAN ENVIRONMENT

by

Lawrence Alan Goldblatt

B.Arch., North Carolina State University

1972

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF CITY PLANNING
MASTER OF ARCHITECTURE IN ADVANCED STUDIES
of the
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

February, 1975

Signature of Author _____

Department of Urban Studies and Planning, January 22, 1975
Architecture

Certified by _____

Thesis Supervisor

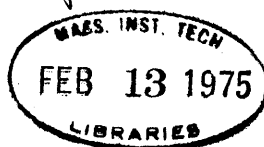
Accepted by _____

Chairman, Departmental Committee on Graduate Students

Accepted by _____

Chairman, Departmental Committee on Graduate Students

Rotch



THESIS ABSTRACT: Educating High School Students About Their Environment

Author: Lawrence Goldblatt

Submitted to the Department of Architecture and the Department of Urban Studies and Planning in partial fulfillment of the requirements for the degree of Master of Architecture Advanced Studies and Master of City Planning.

In recent years, citizen involvement in planning and review of urban development has increased. Active involvement of those affected by urban development is seen by the design professions as resulting in projects that are more sound socially, physically, economically and politically than the yield of traditional processes. Educating high school students is seen as one strategy for availing citizens of the skills necessary to establish and accomplish goals related to their city environment. This study is about how high school students might develop skill and confidence in studying and changing their environment.

This work is premised on the notion that these students should eventually develop into active and articulate consumers of their environment. Environmental education is not seen as particularly appropriate if it only presents professional practice models (career discovery) or merely sensitizes participants to "urban problems". This work assumes there is a role for citizens in the urban development process; and that is to serve as an evaluator of or impetus for socio-physical changes in the urban environment.

The study asserts that education which uses the students' own experience with familiar turf as the medium can develop strong student commitment to learning. Reflection on teaching experiences in two high schools leads to the conclusion that students can become deeply involved in learning, gaining confidence in themselves, if the inquiry starts with what the students want to know; if the inquiry is about something "real" that they are interested in; if their inquiry has them actually "doing", not merely passive recipients; if the students feel trust and confidence is placed in them; if the leadership of the group is fair, firm, and open. Students can best learn about the man-built environment and how it can be changed when they are engaged in testing their own ideas about the world; when the tests they make are conditioned by reality as much as possible; where experiences and discussions bring a new perspective to a familiar thing (i.e., viewing the city from a high place; walking through buildings and spaces known but never explored--like City Hall; arguing amongst themselves about the problems of public housing versus private housing, based on their own exper-

ience). The process should use the setting to support learning by encouraging students to make it their own. The process should be explicit with students about what they can expect to learn.

Beside clarifying process principles, the study presents a typology of learning objectives. The environmental education experience should leave the student with; the ability to identify community resources for solving a given problem; the ability to read and scale maps and plans; the ability to read the qualities of environments , and tie these to user behavior; an understanding of the relation between the built and natural environments; the ability to identify the politics and economics in an environmental controversy; the sensitivity and skill to work with others supportively; a method for grappling with an environmental problem.

The work concludes that the educational process is as important as the content one seeks to convey. It concludes that it is possible to create "articulate consumers" of the environment. This presentation of process principles, learning objectives, and some exercises, represents one effort toward developing an environmentally literate citizenry through education at the high school level.

Thesis Supervisor: Gary Hack, Assistant Professor of Urban Design

ACKNOWLEDGEMENTS

My thanks are extended to Gary Hack, whose aid in this and other work was enormously beneficial. I owe a great deal to Gerald Beals, of Brockton High School, for his enthusiastic support of this work. I wish to thank Charles Ray, of the Boston School system, for his wise counsel at critical times.

My sister, Ruth, performed invaluable service in review and critique of this manuscript. Sandy Congleton, who typed this manuscript, is thanked for not only putting up with my incomprehensible scrawl, but for her sense of humor, which surfaced whenever I lost mine.

And to the many others who administered counsel and patience throughout this work, I offer my gratitude. The frailties and errors of this work are strictly the author's.

TABLE OF CONTENTS

	<u>Page</u>
THESIS ABSTRACT.	2
ACKNOWLEDGEMENTS	4
1 INTRODUCTION.	8
1.1 Why Educate About the Urban Environment?	8
1.2 For Whom, And Why, This Study is Written	10
1.3 What is Meant by Environment	11
1.4 Environmental Education...For Whom?	12
1.5 The Development of Environmental Education	15
1.6 Framework for This Study	18
1.7 About the Brockton and Roxbury Experiences	25
2 THE CENTRAL QUESTION: HOW MIGHT HIGH SCHOOL STUDENTS BE ENGAGED IN DEVELOPING THEIR CONFIDENCE AND SKILLS IN STUDYING AND CHANGING THEIR ENVIRONMENT?	30
2.1 Assumptions	30
2.2 The "Articulate Consumer"	33
2.2.1 Limitations of the Learning Model	38
2.2.2 Limitations of the Model for Practice as Citizens	42
2.3 Principles for Guiding the Learning Process	45
2.3.1 Principles Guiding the Learning Process	45
2.3.1.1 Why Objectives?	45
2.3.1.2 What Makes an Objective?	46
2.3.1.3 Guidelines for Developing Objectives	46
2.3.2 Designing the Learning Activity	47
2.3.3 Managing Learning:	
2.3.3.1 Building the Learning Ecology	48
2.3.3.2 Know Thy Students	55
2.3.3.3 Evaluation	63
2.3.3.4 The Teacher as Learning Resource	66
3 WHAT EXPERIENCES SHOULD STUDENTS ENGAGE IN TO DEVELOP THEIR CONFIDENCE AND ABILITY TO ACT ON THEIR ENVIRONMENT?	71
3.1 Typology of Learning Objectives	71
3.1.1 First Level: Learning Objectives	73
3.1.2 Second Level: Learning Objectives	78

- 3.1.3 Third Level: Learning Objectives 81
- 3.2 Typology of Exercises 83
 - 3.2.1 Brockton Exercises that Worked Well, and Why 85
 - 3.2.2 Roxbury Exercises that Worked Well, and Why 85
 - 3.2.3 What Didn't Work Well and Why: Brockton 92
 - 3.2.4 What Didn't Work Well and Why: Roxbury 93
- 3.3 Some Questions and Ideas for Initiating Learning Activity 94

APPENDIX A: A CASE STUDY IN ENVIRONMENTAL EDUCATION: BROCKTON, MASSACHUSETTS, 1973. 98

- 1 COURSE DEVELOPMENT. 98
 - 1.1 Brockton: The Area; The School; My Role 98
 - 1.2 What Did the Course Intend to Do? 100
- 2 EVENTS.105
 - 2.1 The Events 105
 - 2.2 The Design Projects 108
 - 2.3 The Students Learned... 111
- 3 ANALYSIS OF COURSE DESIGN AND IMPLEMENTATION. 114
 - 3.1 The Teaching Manual 115
 - 3.2 The Student Workbooks 123
 - 3.3 The Support Materials 124
- 4. SOME OBSERVATIONS.125
 - 4.1 What Was Learned From the Student Journals 126
 - 4.2 Instructor's Observations 128
- 5 CONCLUDING ASSESSMENT 130

APPENDIX B: A CASE STUDY IN ENVIRONMENTAL EDUCATION: ROXBURY, MASSACHUSETTS, 1974.134

- 1 COURSE DEVELOPMENT. 137
 - 1.1 What Were My Reasons for Teaching in Roxbury 137
 - 1.2 Course Objectives 140
 - 1.3 The Exercises 142
- 2 THE EVENTS149
 - 2.1 Getting Started 149
 - 2.2 The Students Who Enrolled 150
 - 2.3 The Events 151
- 3 THE STUDENTS LEARNED... 158
- 4 STUDENT ANALYSIS OF THE COURSE 162
- 5 ANALYSIS OF COURSE DESIGN AND IMPLEMENTATION. 164
 - 5.1 The Course Design and the Teaching Manual 164
 - 5.2 The Problems of Developing a Style 165
- 6 ADJUSTING TO THE SETTING168
- 7 CONCLUDING ASSESSMENT 174

	<u>Page</u>
FOOTNOTES.	179
BIBLIOGRAPHY.186

DISPLAYS

- 1: Selected Examples of Environmental Education Programs
or Materials 20
- 2: Schedule of Planned Activities, Brockton 103
- 3: Student Work, Brockton 110
- 5: Roxbury Calendar of Activities 145
- 6: Student Work, Roxbury 155
- 7: Evaluation of Students' Learning, Roxbury 159
- 8: Student Evaluation of the Course, "Introduction to the
Urban Environment" 163

WHY EDUCATE ABOUT THE URBAN ENVIRONMENT? 1.1

The need for citizen involvement in the development of our cities has been expressed by many spokespeople in recent years (Davidoff,¹ Peattie,² Alinsky,³ Turner⁴), practiced by many others (West,⁵ Carew,⁶ Bailey,⁷ etc.⁸) and even become institutionalized (Educational Facilities Laboratory; Charettes; the Boston Little City Halls program; the federal Office of Economic Opportunities; local agency boards). Notwithstanding these efforts, it is felt that participation must be more than just a gesture by a few prominent citizens and a few agencies of city development. One way of moving closer to widespread citizen participation in the planning and management of their environments is to avail the citizens of the skills necessary to establish and accomplish goals related to their city environment.

Growth in our society, requiring the allocation of scarce national and global resources, is nowhere so befuddling a problem as in our urban centers. With the nation's population increasingly urbanized, its residents segregated by class and race, suffering under crime, poverty, poor education and powerless government, urban settlements demand attention. Helping the people affected by these problems to be aware of the means for change is one necessary part of the process toward solution. This study is about such an effort.

Aside from the need to prepare citizens for involvement with changing their environment, there is further reason for becoming involved with public school education in cities; education is in dire

circumstance. Many sources cite the bareness of city school curricula, disruption and struggle due to integration, unmotivated, ill-prepared students, lack of fiscal resources, poor school facilities, etc., as not only a symptom of the urban crisis, but a cause as well.⁹ This study developed around the notion that urban education can respond to and even benefit from these problems.

The environment surrounds us always, supporting or getting in the way of what we do. It is therefore important to give users of environments a sense of how the environment affects them, and how they can learn from the environment, wherever they are, lest these effects be negative. It becomes imperative that the students acquire learning skills that will stay with them, helping them understand their changing needs in relation to the changing environment. It is fundamentally important to reinforce the students' judgment and confidence in his or her own observations.

The environment is a rich source for education--math, social sciences, and even the physical sciences all contribute to an understanding of the environment and how it changes; but one of the criticisms made of high school education is that its arbitrary curriculum divisions do not make for an adequate description of the 'real world'. It is important for the sake of the education of the students to work with what is familiar to them; and the everyday world they experience is part of a whole system. To teach 'environmental education' in pieces, threaded through traditional courses denies the nature of the students' experience with their world.

I thought education about the man-built environment to be meaningful, and special, because it was naturally integrated fields to which the participants had been exposed, while engaging the students' own current interests and life experiences in the learning experience. (It was thought that the reach of the participants could easily find some area of interest. Much literature focuses on the need for successful learning experiences to be grounded in the interests of the student.¹⁰⁾

The proposition is offered that environmental education must differ from traditional education because of the nature of the two tasks it faces (alluded to above)--one, to aid in the reformation of society, and two, to test a model for reforming public education.

FOR WHOM, AND WHY, THIS STUDY IS WRITTEN 1.2

The study, other than by its own example, doesn't attempt to demonstrate the critical need for the kind of education it represents; instead, it assumes that education is at least one strategy for urban (and societal) change (others have written on this topic; See Richard Hatch, 1970). It attends mostly to the detail of how one would go about urban environmental education, by reflecting on two different teaching efforts. The work herein is neither a cookbook for "how to do it" nor a completely developed process worthy of act-for-act widespread replication. It represents one tentative step in the direction of explicating some sound approaches to program development and classroom management, and to surfacing ways of understanding and evaluating growth.

It is primarily aimed at mirroring my development to date, that I may better understand in which direction next to proceed. As such, the work may find some use amongst teachers and administrators in high school settings or students in professional design programs; people whose interests and experience overlap those involved here.

The study, hopefully, provides an answer to the question:

...how might high school students be engaged
in developing their confidence and skills in
studying and changing their environment?...

The investigation that flowed from this question allowed me to explore several areas of interest--curriculum development, classroom management, and program evaluation--as well as to provide a useful product for teachers interested in bringing environmental education into their classrooms. As well, students in professional planning or architectural programs may find the work helpful, should they be interested in high school teaching or curriculum development.

WHAT IS MEANT BY "ENVIRONMENT" 1.3

In both the Roxbury and Brockton experiences, a common definition of the physical environment aided in the development of learning activities. The "physical environment" was understood to describe both the natural and man-built systems that people inhabit in a shared way, ranging in scale from man's immediate shelter up to regional patterns of settlement. The educational problem developed around deciding what was important to communicate about the physical environment (what theories about: structure, components, and their inter-action) and how to convey this material to the students (questions such as: direct con-

tact with traditional design principles? Active modeling of the environment? Observation of the environment?

The experiences aimed to help the participants learn about how man is affected by, and can affect the immediate physical environment.

Students were to:

- learn about the agents of change;
- learn about the process of change;
- learn about the place of values and feelings in shaping the physical environment;
- learn about the relation of the man-built and natural environments.

The experience did not seek to teach the participants; the principles of conservation, the biological sciences, or the cause of "the pollution problem". Its primary purpose was to produce people who would be articulate consumers of the physical environment and participate in its change--not just people able to describe obvious environmental maladies, but people who knew how to solve their own environmental problems. My assumption was that the participants could be easily shown the importance of this ability, for the environment touches everyone.

ENVIRONMENTAL EDUCATION...FOR WHOM? 1.4

Environmental education is thought of as a "new movement" by many of those who sponsor such programs ("progressive" schools, usually suburban, and middle class). Their concerns seem to focus on the stability and condition of the natural environment, not the urban man-

built system.¹⁰ My bias was that while it is true that middle-class people need to understand the nitty-gritty workings of their environment (and while suburban sprawl and pollution are serious issues), those people are in less need of understanding and control than poor people.

For the most part, suburban middle-class high school students go on to college; all have some means of economic independence, freeing them (somewhat) from the vagaries of the system that confines the urban poor. Therefore, I believed that this educational experience should be directed at creating in the urban poor an understanding of the formal procedures of environment-making; an understanding of human needs and how the environment can satisfy these; an understanding of how the factors create the environment to satisfy needs, and how the actors can be influenced. The assumption supporting this bias was that this kind of knowledge can lead to more control over one's environment. My belief is that a group of articulate people, sensitive to the workings of the system, can creatively engage that system to meet their needs. (My bias that suburbs are in less need of these skills was affirmed by working in Brockton High School, a largely white middle class setting; this experience led me to the inner city Boston teaching experience.)

I engaged in work with high school students for several reasons. First, I felt that working with people before they had established major responsibilities and while they were still evolving interests made good sense. Whether they were or weren't looking for ways of

understanding the wider world about them, these high school students would soon be faced with its conditions. Using the environment, I thought, was a good medium for introducing adolescents to a wider world view and confidence in their ability to act in the world. I believed that by reaching high school students before they became laden with major responsibilities, that sensitizing them to how they can play an important and active role as citizens, would result in a more confident and informed citizenry (and, implicitly, a better society). By initiating interest in their future role as "consumers" of the environment, the experience aimed to reinforce the participants' identity and sense of worth, and provide an encouragement for investing some care in the world about them. This kind of affirmative study of their surroundings may begin to combat a pervasive pessimism amongst adolescents.

In addition to the societal impact and the effect on the individual participant, I thought an environmental education experience was important for my own growth. That is, with public education (especially inner city secondary schools) in such a crisis, as a design professional and as a citizen, I could not just "be interested" without trying to help solve the problem. Relatedly, I felt that my professional education was lacking in many ways--one of which was contact with people who are impacted by the kind of work that architecture and planning professionals do. I felt a need to get involved with these people, as a balance to the narrow view that professionalism imparts.

Finally, I feel environmental education is important for the ul-

timate effect it will have on the traditional planning and city management disciplines, and even on urban life itself. I believe that the professions need the challenge that articulate users could provide; and also, I believe that cities will benefit from active, sensitive, and caring citizens who can initiate management change on their own territory. They also benefit by having to explain what they are thinking about--with the result of a sense of clarity about a professional's theories.

THE DEVELOPMENT OF ENVIRONMENTAL EDUCATION 1.5

There are several historical roots to the development of the movement to teach non-professionals about their physical environment. The rise of industrialism in the 19th and 20th centuries, and the concomittant rise of the professional planner and builder of the physical environment, signaled an estrangement of the average citizen from the production of the facilities he used every day--highways, schools, homes, hospitals. The mid-and late-twentieth century development of even more complex environmental building only emphasized the need for involving users in the planning, implementation, and management of such projects.

Due to population growth and migration, America became an increasingly urbanized nation. The post-World War II boom and the spread of suburbs, air and water pollution, and shifts in modes of transportation gave conservationists and preservationists reason for announcing alarm. Upper and middle class by tradition, the Garden Clubs, Sierra Clubs, and others gained in both legitimacy and political clout by the

late '60's. Their arguments were popularized by a combination of youth movement activity and a deep-seated anti-urban bias in American thought.¹¹ The "environmental crisis" of the '70's--foul air and water, depleted natural resources, the energy question--made it fashionable for schools to address the question. Development grants were given by the federal government, which even established an Office of Environmental Education. (There were 106 projects funded across the nation in fiscal year 1974. Of these, roughly 10 percent dealt strictly with the urban built environment and how it could be changed.)¹²

Closely following the development of public consciousness about the management and use of the natural environment were changes in the design professions, public policy, and educational reform that evolved a different definition of "environmental" education. In 1960, Kevin Lynch published Image of the City. This document, intended for lay people as well as professionals, posed a framework for understanding city form. The book is simple and straightforward; the effects on the design professions have been monumental. Professionals, not just in architecture and planning, but in psychology, sociology, and geography developed interest in people's perceptions of their physical environment. This new focus, combined with growing interest in applying thought to how environment and behavior are linked, led to the definition of a new field (environmental psychology). In a small way, and combined with the development of interests in other fields (computers, decision analysis, individual and group process, etc.), the changes stimulated designers to contemplate how it was that they came to struc-

ture the environment the way they did.

In architecture, the debate has long raged between the "taste of the people" and the "taste of the designers". Architects sought a way to communicate to the masses what good design really was, and why it was important. "If the people were only educated, they'd think like us," was the commonly heard plaint. In the late '60's and early '70's, when even staid architectural schools were subject to questioning, some students shifted their attention from traditional studio problems to working in anti-poverty action agencies, multi-service centers, etc. As a result of the motivation to explain to the people what architects do, and to work for the needs of the people, students came to understand that the nature of this new client was very different from the model held by standard architectural practice. The professionals learned to come to the communities prepared to listen, not to talk. The backlash from the advocacy efforts of the sixties has now begun to form the attitude of "give the communities the skills and let them work it out themselves." The argument amongst architects about aesthetics still, however, carries on, with architects sharing various views about the problem of the masses understanding architects' work.

The experience of OEO, public community development efforts, and academia's experience with advocacy have led planners to ask, "Why won't all people participate? How can we tell them how important it is for them to 'get involved'?" Planners would like the people to

understand the planners' limits as professionals; that utopias can't be delivered. Planners wish environmental education could temper the wishes of the people by educating them as to how complicated change is, and as well, how it comes about.

Developers have not asserted a public image at all. Working as they do with finance agencies and political ties, an openness and directness is contradictory to their methods of operation. But now, and in the future, with the environmental impact statement and community review, the developers' view will be that people should understand "for whose benefit the project is created", and "how hard it is to create a project". They, like other environmental change professionals, would have the people share their values.

I see all these influences (the green environment advocates, perception of urban forms, architectural awareness, planning process involvement, and understanding the motives for urban development), demanding citizens who understand the actors and their roles in change; who understand their own values, and how the system gets energized; so that they can become an effective force in deterring, constraining, initiating, and bargaining with development of the environment.

FRAMEWORK FOR THIS WORK 1.6

A task of this study is to show evidence that supports or disproves the named assumptions; where possible, supplying answers to the questions raised; and discuss the questions arising from the conduct of the experiences themselves. Looking to the field (such as is visible) pro-

vided some theoretical and practical support for this work, and formed a framework within which my own work could be understood.

How can that framework be characterized? The approach I took tried to acquaint students with the man built environment, and its relation to the natural environment. The reference frame for this work excluded those "green environment" programs sponsored by conservationists, high school science departments, and the like. There are many programs that together begin to define the class of processes, products, audiences and ideas that form the foundation for the field of built environment education.

There are organized teaching efforts that represent (refer to Display 1) a whole curriculum in environmental education, (Habitat)-a separate course within a curriculum, entirely devoted to environmental education (University of Texas at Arlington); environmental education packages that are threaded through curricula (Planning for Change, GEE, for the mid-adolescent, Boston Society of Architects at the elementary level). Then there are pieces of teaching experiences that serve to supplement organized teaching:

Books (for adults: Image of the City; Looking at American Cities

Close-Up;

for kids: Cathedral; Uptown;

about kids' use of cities: The Children; 36 Children.)

Television (WGBH's "If You Live in a City, Where Do You Live?");

Places (adventure playgrounds; Boston's Children's Museum).

DISPLAY 1: SELECTED EXAMPLES OF ENVIRONMENTAL EDUCATION PROGRAMS OR MATERIALS

Organized teaching
at the elementary
level

The Boston Society of Architects' Urban Awareness Program; Funded by the B.S.A., Cambridge School Department, and the National Endowment for the Arts, the program is now in its second year. A salaried staff arranges for architects and planners to visit fourth grade classes throughout the Cambridge system (12 schools). Lectures are about once or twice a month, based on materials prepared by the architects. The program has been effective in making students aware of components of their physical surroundings.¹⁴

Organized teaching
at the junior high
level

The Philadelphia School system; Growing out of several years of collaboration between city and social studies teachers, and architects, a work book series ("Our Man Made Environment") has been produced. Widely distributed throughout the country, the workbook isolates concepts for students to, literally, build around. Lectures, field trips, slides, and projects are classroom activities that build from students' workbook exercises. The program is funded by the Philadelphia schools and various foundations through the Group for Environmental Education. Evaluation of the program will soon be released.¹⁵

The New York City school system: Planning For Change; Richard Hatch, an architect, developed a learning packet of slides, written concept descriptions, and suggested exercises. The program evolved out of the Architects' (Renewal) Committee for Harlem (ARCH). It aimed to raise students (grade 7 and above) understanding of how cities came about and how they can be changed. Support for the project came from various sources. It has had widespread use in New York City.¹⁶

Organized teaching
at the senior high
level

C.I.Y. - Community Interaction Through Youth - is a "program, not a school" drawing on high school students in Cambridge and Brookline. It is an after school activity for which students receive credit. C.I.Y. uses the city as a learning resource, bridging the gap between school and community. Individual courses are offered by unpaid volunteers throughout the city. Funded since its inception (in 1971) by the Cambridge and Brookline school systems,

Display 1: Continued

the program has been effectively offering students individualized learning experiences, giving them an understanding of how the city works and how to learn from it.¹⁷

Organized teaching at the university for non professionals

University of Texas at Arlington; An interdisciplinary teaching team offered a course to undergraduate non-professionals aimed at raising their awareness of perceptual processes; the texture and form of the environment; man's need to order and symbolize; and his effort to build community. The course, relying mostly on discussions and limited projects, was successful at building individuals' awareness of environment and confidence in expressing their observations. A program evaluation will be available this year.¹⁸

Organized teaching for professional educators

Scott Smith, a Cambridge architect, taught a course at the Boston Architectural Center in 1973, for metropolitan area high school teachers. Using lectures, field trips and guest presentations, slides and sensitivity exercises, Smith focussed on personal awareness; how cities grow and change; and components of the physical environment. The project was funded by participants' fees and a grant from the Association of Collegiate Schools of Architecture.¹⁹

Organized teaching in an open school

Habitat, Cambridge, Massachusetts. In the fall of 1973, Mike Ertel (a Harvard Graduate School of Design student, supported by an ACSA grant) offered a course to Habitat's open enrollment adult population. The course focussed primarily on individuals' sensitivities to the urban setting. Exercises and discussions were the principle mode for the experience. The instructor felt the course was less successful than he had hoped, primarily because participants' interest was directed at the natural environment.²⁰

Books: by children

The Children: Poems and Prose from Bedford-Stuyvesant. Edited by Irving Benig; New York, Grove Press, 1971. Benig taught for three years in a black and Puerto Rican ghetto. His outrage at the educational system was fueled by a sensitivity to his students and their lives. Benig gathered poems and essays from his students - and they say much about learning, life, and the city. The writing in the collection uses the city as subject, increasing the students' confidence in seeing and writing about what they see - because they have something to say.

Display 1: Continued

Books: for children

Uptown, John Steptoe, Harper and Row, NY, 1970. John and Dennis wander through Harlem, digging brothers, hanging out, rapping with each other. The setting is urban, the characters are city dwellers, their activities and language are common to the inner city. One of several recent books that portray life in their terms, "like it is", the book fills a vacuum created by anti-urban, all white literature for children.

Books: for adults

Reading American Cities: Close-up, Grady Clay, Praeger, N.Y., 1973. A book written for lay people, it awails the readers of perceptual tools for reading their cities. A journalist's vivid collection of adjectives for describing and understanding components of the urban environment and urban environmental change.

television

WGBH-Boston: IF You Live In A City, Where Do You Live? The program sought to introduce the idea of "urban conservation" in public schools; and to encourage public officials concerned with urban conservation. The educational objectives (to teach that community is largely a personal definition, that communities are different for different people, that communities change over time, alternatives to choose from means priorities must be developed), were to grow from discussions, activities and exercises, based on a series of films. Five 30 minute films were developed; activity cards, tied to each film, were shared by several students over the five week course. The films were broadcast in 20 cities nationwide; eventually one half million students had contact with the program. Evaluation revealed that concepts of "urban conservation" were effectively achieved by students across a wide variety of student backgrounds. The involvement of public officials was found to be most satisfactory when they were involved by direct contact with students.

places

The Children's Museum, Boston Massachusetts, opens itself to manipulation and experimentation - its display area is a kinesthetic, sensory, challenging environment. By using machines and exhibits that respond to the child's touch or movement, the environment truly becomes educative. The Children's Museum has been a part of several projects outside the facility itself that make use of the physical environment as an educational tool. Museum staff,

Display 1: Continued

in cooperation with the merchants of Centre St. (Jamaica Plain), created a street fair that exposed the street's products and processes to passers by. People could watch blipops being made, make and consume a pizza, watch a meat loaf be created, or ride a fire engine.

"Washington Environmental Yard," writes Robin Moore of U.C. Berkeley, "is a pilot school community project in environmental education located near downtown Berkeley". The yard, formerly an asphalted school play area, has been converted by students and community people into a warehouse of things changing and changeable. Asphalt was stripped in favor of soil; traditional play areas mix with free form ponds and sculpture. Living things have taken root there. The project has resulted in more interdisciplinary work amongst teachers, greater school-community interaction about education, and a raised consciousness about the man built and natural environments for participants. Organization of found and donated materials and human labor was initiated by Moore, a landscape architect.²³

Non-school environmental education

Ecologue; For four months in 1969 residents of a neighborhood in Cambridge, guided by professional planners from MIT, engaged in a process that aimed to enhance "the understanding residents have concerning the social and spatial structure of their neighborhood ... thereby improving their ability to act effectively for environmental change." Interest of the highly diverse group of 100 citizens remained strong during the process - but once the funding ran out, continuing involvement dwindled. Some issues continue to receive attention, even to this date; a community health center was initiated and a neighborhood newsletter established.

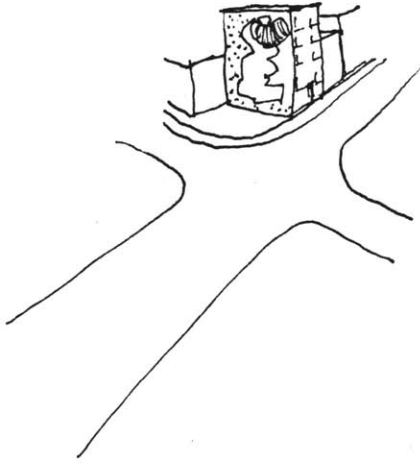
Team discussions (of four to six neighbors) were convened by a neighborhood person. The discussions, augmented by photography excursions and map making, focused on places and problems shared by participants. The first part of the process analyzed what existed, the second part being concerned with setting priorities for community action.²⁴

Boston Summerthing: Urban Murals; In the late '60's the City of Boston's recreation program "Summerthing"

Display 1: Concluded

sponsored the painting of dozens of murals in the city's South End, Roxbury, and Dorchester districts. The murals depict a range of themes - many are aimed at raising ethnic consciousness or symbolizing urban struggles.

A result of these murals, at least amongst the teenagers I worked with, was the feeling that their part of the city was "funky and together" because the murals added life to the street, making the buildings into art. It affirmed in them, perhaps, the sense that it was possible to alter the world they saw everyday.



To date, the prime characteristic that distinguishes the field from other kinds of education is, of course, its focus on the built environment (how it came about, what its components are, where it is going) and the effect of the environment, both natural and man-made, on the human condition (cultural adaptations, immediate effects on attitude and behavior, expression of values through the environment). As more teaching efforts are undertaken, more methods are developed, tested, and discarded or refined. Commonly, methods have included participants' use of inexpensive cameras for documentation of problems and consciousness-raising; mapping of homes or neighborhoods or other familiar areas for learning scale, components of the environment, sensitivity to man's place in the total physical environment; lectures by design professionals, learning about what they do and how they do it; building cardboard shelters, for the gain in understanding about human differences in perception, in spatial needs, and for learning about the effects of various components on human attitude. Project based or field related activities are common modes of teaching.

Representative projects are presented¹³ in order to give some background for in-depth presentation for the work that comprises this study.

ABOUT THE BROCKTON AND ROXBURY EXPERIENCES 1.7

Before proceeding with the central topic of this investigation, it might be useful to try and understand a little of the two experiences the study reflects, especially in light of the examples just discussed.

Brockton, Massachusetts, is a rapidly urbanizing town of approxi-

mately 90,000 people, located about 25 miles south of Boston. In the fall of 1973, I aided in the development and teaching of a course aimed at giving the students the ability to model future physical development of their town. The following spring, I taught a course in Roxbury, Massachusetts, a district of about 60,000 people within the city of Boston. That course aimed to develop in the students skills enabling them to recognize and work toward meeting their physical environment needs.

Both Brockton and Roxbury had seven regular attendants; however, all of the Brockton participants were male and the Roxbury group was mixed. None of the reported environmental education projects had such a low student-teacher ratio; undoubtedly this fact was advantageous to the effectiveness of each group. Brockton participants were all juniors or seniors; Roxbury participants were either juniors or freshmen. The spread in the Roxbury group was disadvantageous, while Brockton benefited from the level of maturity and lack of age tension within the group. None of the other formal education efforts dealt with age-varied audiences. The Washington Environmental Yard allowed flexibility in use so that groups that wanted to age-segregate themselves could (i.e., teenagers lounging about or playing basketball, pre-teens in active games involving running, hiding, and exploring; youngsters in water or sand play).

Both Brockton and Roxbury participants represented a range in skill level corresponding, in the Roxbury case, with age. Where the program is designed for students to aid each other in learning (as in

both cases), students must be cognizant of the goal, and so motivated, to make the program work (as it did in Brockton, but didn't in Roxbury).

In Brockton, the instructor largely used local materials that either he developed or students in earlier classes had produced. He also effectively utilized some of the traditional planning and architectural texts. In Roxbury, all of the learning materials came from local agencies (reports, maps, and the like) or were created by the instructor in response to particular needs. Brockton had a workbook for students, but it was under-utilized; Roxbury did not have materials (i.e., handouts, articles on special topics, articles presenting broad overviews) that were as well-developed as the Planning for Change or Our Man Made Environment workbooks. The feeling from both Brockton and Roxbury was that these workbooks should serve as models for comprehensiveness and quality in the re-development of materials.

All of the environmental education efforts that took place in schools gave academic credit to the participants; so, too, did the Brockton and Roxbury classes. Grading and credit has a legitimizing effect on the activity. (By mistake, the Roxbury students didn't realize they earned academic credit until the end of the term. That lack of communication alone did not explain the erratic attendance; other teachers in the school reported that attendance in the environmental education class was about normal for the school. But it was reported by students to be a very important fact in determining motivation and commitment.) I reviewed only one project that reported on attendance, and its relationship to involvement--that was the Ecologue project. In

that case, when the pay for participation ran out, involvement dropped (though some people have since carried issues beyond the length of the project).

Like the University of Texas at Arlington program, Brockton had the students epitomize their ideas for some future environment; Roxbury bore more of a resemblance, in this respect, to the Ecologue program, where the participants spent much time observing their existing community, only later dealing with the future of the neighborhood.

The Brockton experience asked the students to look at their town in almost entirely (for them) new ways (via mapping and drawing their ideas for the future); in the Roxbury experience, the students also observed things familiar to them, but in a different way. They were sharing the familiar with a stranger (the instructor), and at different times during the course the reverse was true. We explored my territory (M.I.T., and home) as well as theirs (Dudley Station and the projects). Roxbury was like Ecologue in another way, too; the students were given a view of how the city development process works, from talking with key actors and with each other. Unlike Ecologue, the process never brought the students to the point of ranking their values, though comparison amongst the students led to absorbing discussions. Brockton was unlike Roxbury or Ecologue, but more like the University of Texas at Arlington program in its manner of having students propose thoughts or designs for the future, which the other members of the group critiqued. Brockton bore some resemblance to the Boston Society of Architects' Urban Awareness program

in the way that visitors came into the classroom to talk about their work; Roxbury was very unlike either, in that the course participants went to the agencies, exploring their turf as well as their practice. The Roxbury project closely shared the precedent established by the Planning for Change curriculum--to produce students who understood how cities changed and how they could be changed. Brockton was aimed more at having students learn to 'model' future development, using the environmental design professions as models.

These few comparisons should establish a framework for understanding the following detailed discussions about the learning derived from the Brockton and Roxbury projects.

THE CENTRAL QUESTION: HOW MIGHT HIGH SCHOOL STUDENTS BE ENGAGED IN DEVELOPING THEIR CONFIDENCE AND SKILLS IN STUDYING AND CHANGING THEIR ENVIRONMENT? 2.0

ASSUMPTIONS 2.1

In trying to formulate an answer to this question, I relied on the Brockton and Roxbury experiences, as well as a review of other similar projects, and educational literature. The teaching experiences provided some learning for me about the viability of my assumptions.

A fundamental belief with which I began was that development of "interest, confidence and skills in studying and changing their environment" was, indeed, within the reach of high school students. This assumption rested on the proposition that if the learning environment values the participants and encourages free and open questioning, important barriers to confidence and skill-building will have been reduced.¹

Experience demonstrated that the goal was within the reach of high school students. Successful engagement of students in such study as is outlined here depends upon the individual's economic and family background, motivation for achievement, career goals, peer group pressures, social conditions, expectations about school, as well as the condition of the learning environment itself and the attitude that the instructor brings to the experience. It was found that a learning environment which values participants goes a long way toward reducing barriers to learning, but one must always remember that the learning environment is modified by those factors outlined. They can be understood, but rarely controlled.

Another assumption I made was that learning can be successfully measured. I believed that this could be accomplished by observing change in the participants' behavior. Such change was demonstrated (see the case studies included in the appendix to this report), offering evidence for what made successful learning for participants. This evidence was important to deriving an answer to the central question of this work.

I assumed that study of the familiar built environment would be interesting to high school students. As evidence that this assumption was not unfounded, most of the Brockton students (prior to the course offering) expressed interest in the course material. The commitment was high amongst regular participants, and some even developed specific career goals out of the course. The Roxbury students, on the other hand, came to the experience with little information about it or enthusiasm for it; as the experience developed, so did the regular participants' interest. The fact that the environment can be immediately perceived, and its influence observed, is an aid to engineering at least passing interest in participants--and having their interest is a condition necessary for the successful achievement of confidence and skills growth.

I assumed that planned classroom exercises were an appropriate medium for environmental education; and I assumed that such exercises could be devised and employed. Support for these assumptions came from the observation that others have had some apparent success with this

kind of approach (see especially, Planning for Change, referred to earlier).

The Brockton and Roxbury experiences provided active tests of these assumptions--and they provided an illuminating insight. This thesis had originally begun by trying to solve the problem of what experiences one would offer to high school students to develop their "confidence and skill in changing their environment". The original formulation failed to account for the condition of the learning setting, the participants' backgrounds, changing motivations, and the shape of the wider social-economic environment.

My experiences were abundantly lucid in their message: the real problem is not so much what experiences one would offer, but how the participants become engaged in the experience. So, this work became a study about teaching, and not so much one about environmental design. One realizes that most environmental education literature has dealt very little, in fact, with the issue of educational process; this work attempts to remedy that failure.

Another early assumption, that I could manage the classroom teaching role, was also an important one; the degree of validity of this assumption had much to do with how an answer to the central question evolved. An answer is attempted in the following sections. The basic approach that emerged from my teaching experiences is discussed first.

THE "ARTICULATE CONSUMER" 2.2

The Massachusetts Audubon Society has aimed at creating "environmentally literate citizenry."² "Environmental literacy", they write, "is awareness of the basic principles that govern man-environment relationships."³ There are two components to environmental education in the Audubon Society's view; one is the process by which the learner explores his interests; that is, "environmental education uses the learner's environment to instruct him." The other component is the study of man-environment relationships. The environmentally literate citizen "should be able to recognize problems when they arise...he has a keen sense of stewardship...improving the ability of his home area to sustain and enhance the quality of life."⁵

While some fundamental principles are shared with the Audubon Society (teaching modelling skills as an aid to coping with change; use of the students' immediate environment as a learning tool; the teacher as facilitator of learning, not giver of facts) I differ from their largely biological-naturalist base for the learning model. This theory does not carry an active enough view of the learner, nor a strong enough emphasis on the relation between the learner and his built environment.

Environmental literacy implies, to me, too passive a relation between the world and some independent observer. There is the implication that the individual is thought of merely as a "reader" of the environment, which neglects the responsibilities of ownership ("stewardship") that also bear on the individual. And the Audubon Society's

concept of environment--as evidenced in content objectives and suggested teaching strategies--does not focus on the physical environment (both natural and man-built) and its relation with human behavior, but focuses primarily on the natural environment.

The Group for Environmental Education (GEE), a collaborative of architects and educators in Philadelphia, has produced a series of workbooks aimed at the intermediate school age level (discusses earlier, Table I)⁶. The cut-em and paste-em workbooks pose four questions to the student:

- 1) What is the man-made environment?;
- 2) Why do we build our environment?;
- 3) What determines the form of our environment?; and
- 4) How do we change our environment?

The learner builds or looks for illustrations of points made in the book. The excitement for the learner is in discovering the correspondence between his familiar world and what the book describes. In this model, the student is at the center of the learning process; he builds the book's models, and he, in turn, is stimulated to observe his own unique world. This model best fits the pre-adolescent, who still looks to authority for direction. The important feature of this model, I believe, is that it reinforces the importance of the learner's observation of his own experience, and studies and moves on his unique needs.

A common goal of many environmental education programs is to "heighten awareness". A principal theme is to "get the students to

see the environment is rich with information, with resources."⁷

These programs analogue the student's mind as if it were an instrument in need of sharpening; or they see it as a bucket, needing to be filled. The danger of these conceptions is that they imply that the mind is passive.⁸ It is not. This model puts the teacher in the position of doing all the learning, simplifying, categorizing and analyzing.

Simon Nicholson conceived the "theory of loose parts." "In any environment," he writes, "both the degree of inventiveness and creativity, and the possibility of discovery, are directly proportional to the number and kind of variables in it."⁹ In his notion, it is the world that is to be studied, not the students. He pictures the students moving at their own pace and interest, organizing their learning according to their desires, sharing with each other their own important discoveries. This conception comes close to what I believe is a proper model for environmental education.

In thinking about the experience of Brockton and Roxbury, and consulting the literature (see, for example, Nelson in Coates, 1974¹⁰). I have come to believe that the notion of "articulate consumer" best captures the relations of teachers, students, problems, and resources applied to the study of environmental education...and applied to the role for which the students are preparing. The articulate consumer knows what he/she wants, or is confident enough to inquire as to his/her needs. The consumer knows the system well enough to figure out a way or two of getting what is needed. The consumer picks and chooses amongst opportunities and combines them in a unique fashion suited to

his or her needs. The consumer can state his or her needs such that a supplier (the faculty or the 'real world') can help to solve a problem. He or she is able to judge suitability, when the solution meets the users' needs and when it does not. The consumer isn't involved in the production of alternatives (that is the role of the teacher; or of the world at large), but by his or her awareness, will affect what the market offers. The consumer makes his or her own decisions, and maintains responsibility for those decisions. This model describes not only the future role students evolve toward,¹⁰ but also the role which they play in the educational process.

The Brockton experience sought to have the participants develop a "whole" knowledge about man and his environment. The experience tried to "complete" their education about the physical environment (the students had already studied the natural environment earlier in high school). In moving toward this "whole" education, some of the attitudes and actions we adopted were not entirely consistent with what I now view as an appropriate approach to education.

The Brockton course had a "plan for education" which it presented to the students, a plan for how they would learn. This act communicated mistrust to the students, especially evidenced by the confusion and discomfort with the first exercises. The start established a discordant tone amongst students; in reaction to their discomfort, the students started to work on projects of personal interest. The sudden shift struck the students as a little bit too much of "doing what we

want to do." The style did eventually fit the students well, and they grew to feel understood and trusted by the faculty. But the instructor's attitude that the exercises had to please the students was a motivator of decisions in the implementation of the course. Later, Mr. Beals (the instructor) wrote,

The challenge is...developing a method of delivery...that our affective and cognitive objective content can be transmitted within a framework that is acceptable to high school students.

It was not true that acceptability was a principal goal for the exercises. Though by no means unimportant, such an attitude implied that the students are passive receivers of the teacher's gems, which were sent with the purpose of pleasing the students. This is an idea which, in retrospect, we found sadly wanting. Much of my experience in Roxbury, and a good deal of the literature, taught me that this attitude fundamentally disrespects the individual. Less paternalistically, the "articulate consumer" model implies an array of learning experiences that students and staff draw on together--the teacher acting as a guide to what is available and appropriate, and the students forming individual paths based on their own motivation.

The Brockton experience presumed a professional role for the futures of the students; that is, activities were directed at the students as if they were to be professional planners. Students saw possible actions in terms of what was within the professional's purview. In some cases, the students developed career goals in the architectural or planning fields, but for most of the students, this role wasn't suitable.

Part of their early discomfort was not only with the learning process, but with the more obvious limitations of the traditional professional models.

Drawing on the Brockton experience, the Roxbury course developed the idea of the "articulate consumer" to stand as the role toward which those students were evolving. The experiences of the course were to lead to raised awareness of the components of change in the physical environment; understanding how the different actors perform and who their clients are; and the building of the students' confidence to study and reduce problems affecting them. This model makes sense, given the level of the students' motivation, and the possibilities open to them in the future. This approach did not negate the possibility of professional aspirations (one student did develop such a goal), but more appropriately matched the students' expectations about their own lives than would the professionally modeled course.

As described in the case study, the evolution of the learning experience in Roxbury had to be responsive to shifting conditions (attendance, students' mood, interest, location of meeting, season, time of day, etc.). This experience crystalized for me the importance of developing the learning experience around the "articulate consumer" model--where guidance of the experience did not come from some pre-determined rigid plans, but from flexible strategies appropriate to the conditions.

LIMITATIONS OF THE LEARNING MODEL 2.2.1

The principal feature of the "articulate consumer", the ability

to study and to change the environmental problems affecting them, was also the least testable of the course objectives. Term-end interviews provided evidence that about half of the Roxbury students developed the skills and confidence in action that was expected of them. Why did the "articulate consumer" model fall short of its goal?

There are, as the Audubon Society notes, two aspects to the environmental education process (a notion which this work shares); first, is the content to be communicated, and second, is the process by which the communication takes place. The process model with which I had hoped to operate, failed to account for several aspects of reality; this comprised the full achievement of the goal.

I wanted to deal with students who were "turned off" to school, people who were "troublemakers" or acted "uppity" to teachers. I felt that these were, perhaps, the people who could benefit the most from learning, since their natural tendency was to question everything. I felt that they had the highest probability of being effective "articulate consumers" once they left the school setting. I thought that these students would come to have some serious purpose once they had been confronted with a reality they knew but had never before been asked to face. These students, though, had always been told not to have serious purpose. They were the ones who were labelled by parents and teachers alike as hard to manage. The fact that they were adolescents made it even less likely that they ever would have thought with some concern about the world--they were reminded time and again that their thoughts and ideas had no worth. The course I chose to conduct had to face this

problem squarely. It was a big effort to undo the knot that had been tied long before, in so many different ways.

As the Roxbury experience was enacted, it partially fulfilled the model design (to create articulate consumers of the educational environment). Partially. The exercise for which the students had to "make their wishes known" about the future requested the students to do something which they had no reasons for doing. Being suspicious by nature, and trying at the start of the course to figure out what I was asking, the students did not respond well. Because no one had ever asked their opinion before, it was too much of a risk for them to venture a guess. I expected the students to trust me without giving them reason to do so. They couldn't believe they would be taken seriously, and if I did take them seriously, it just reinforced their belief that they shouldn't trust me--after all, what adult ever had?

There are some other basic problems with this model, associated with reaching into other people's experience and using that as a base for learning. For example, asking the students to map their neighborhoods might have been read as, "Let's look at your neighborhood and see what's wrong with it." That sense contradicts one's natural tendency to want to put one's own possessions (as extensions of self) in the best light. Asking the same question more carefully, like, "What's meaningful about your neighborhood?" creates another problem: the question has meaning only to the questioner, not to the respondent. The most sensible approach, I believe, is one similar to the Group for Environmental Education--preparation of information or experiences

that people can use to understand their own situation. And, you don't put their world on display unless they bring it forward.

The "articulate consumer" model needs a feedback loop. As a supplier of information and exercises, I had to understand what experiences were meeting the students' needs. But asking the students what they had learned (such as after a field trip), bothered them. They didn't like having to repeat what they already knew. I was pulling on the students, rather than moving with them.

The students reported that I was too soft on them, that I let them get away with too much by not requiring homework or by sending attendance slips to the principal's office; I felt I was alternately demanding too much of the students or leaving them alone (perhaps other first-time teachers have this problem). Once in a while, a balance was struck. When it came to disagreements, I vowed I would reason with them; it took me some time before I realized that these students really didn't like to be reasoned with or have responsibility for their own actions. They wanted rules and outlines for how they should behave. This is understandable, in that these students were rarely listened to or allowed responsibility. But this was the greatest source of the problem in developing a proper balance between demanding too much and being too soft. Ambivalence on my part about my role in the classroom, (i.e., just what does it mean to be a "guide"?) created this problem. It was not a reflection on the model so much as a comment on the implementation of that model. Where the Roxbury process worked most successfully was on the field trips and

in some of the post-trip discussions. On the whole, the field trips worked better than most of the in-school sessions. The out-of-school sessions said, "Let's have some fun and learn, too". The students were grateful, of course, for getting away from the school; but this wasn't what made these sessions so good. They accepted me as a partner in their learning when we left the school; we worked together in observing a situation, cataloguing it, analyzing it, and judging it.

In the classroom, I felt that I had to make sure that something was said and learned; on the trips there were no boundaries that declared, "this is teaching and that is learning". The students became "articulate consumers". The best aspect of the term, reported the students, was this aspect--that it was free. This attitude led them to feel their opinions were valued, and they were able to ask questions openly, without humiliation. Such results gave support to the viability of the basic educational model.

LIMITATIONS OF THE MODEL FOR PRACTICE AS CITIZENS 2.2.2

The "articulate consumer" model neglected another value orientation of these students. The prevailing attitude in their community is not toward control over anything, but toward survival. The world, as viewed by the poverty class, is seen as a fixed set of happenings, an unending set of preordained experiences. The reality of the life is overpowering. Therefore, escape attempts result (drug use, criminal activity, dropping out). But, of course, escape fundamentally changes very little. To survive is to manipulate the rules a little, but never to change the order of things. Thus, the truant officer

or policeman acts, and yields status by his action; Look! Someone took a chance against the system! Someone gambled! The pimp epitomizes this value, prevalent amongst many of the teenagers in the school where I taught. The pimp had achieved all the material power he ever needed--the fanciest cars, the "hippest threads" - and he achieved it without doing anything, just by being smooth. The anti-authoritarianism I thought I wanted to deal with wasn't really revolutionary; that is, struggling at the root of all power, but only mild protest against regular abuse.

My expectation was that I would change this orientation enough so that the participants could feel they could struggle with control, not merely to learn things so they can "better expect what will happen". My thought was to use the environment to help people to learn "skills and confidence in doing", trying to fulfill a need that the larger society had created in stripping the adolescent (and, in general, the poor) of his legitimacy and worth. The environment was to become a mode for achieving competence as individuals and some sense of acceptance by adults. Perhaps an extravagant hope, the "articulate consumer" model holds that by exposing individuals to the existence of entrepreneurial skills and familiar community figures who apply these skills, that a step toward breaking the bondship of powerlessness will have been taken. Access to tools--and demonstration of their use--will presumably lead to a change in belief; that, indeed, "there is something I can do". This was, perhaps, a big burden for the educational effort to assume.

Clearly, this concept supports the acceptability of the entire socio-political-economic system to which it allows access. I have since come to understand this strategy as hardly even reformist; it assumes that if poor people had the skills and knowledge I sought to convey, then the system could be manipulated to provide better jobs, better housing, etc. In theory, it sounds benign. Practically, it is unachievable. What actually would (and has) resulted is that having achieved such skills and understanding, the individual would leave the poverty class and emerge as much a part of the middle class as the rest of us. Some economic and social "ripple" benefits might result in the community of poverty, but it would leave intact the class structure and the problems associated.

I conclude that, as a strategy of social change, this educational model is hopeful only if it results in learning for a number of people, not just several individuals. And such learning ought not to leave aside discussion of the society's values, the impact of future development, and how to obtain the greatest good for the greatest number.

The previous section discussed the approach that developed from the classroom teaching experience and comparison with other environmental education programs. While acknowledging the model's faults, it is proposed as a start toward answering the central question of this work. The model alone is not enough, however, to begin to show just how one might guide the classroom learning experience. Toward this end, principles for guiding the learning process (derived from the literature and supported by the classroom teaching), are presented. These, taken with the model outlined above (Section¹), and with the description of the kind of experiences that work best (Section^{3.2}) form a tentative answer to the central question raised by this study.

PRINCIPLES GUIDING THE LEARNING PROCESS 2.3.1

Teaching, it seems, can be broken into three major functions. The first is the planning function; that is, thinking about objectives and designing exercises to achieve these goals. The second is the management function, creating the conditions for learning activity. And the third function, a derivative of the second, yet standing as important as the others is the performance of the teacher in the learning setting--either as content communicator, facilitator, or resource person.

WHY OBJECTIVES? 2.3.1.1

The act of making explicit the goals for the course, and speci-

ifying the content aimed for, results in a deeper understanding of the material by the instructor. It is a good tool and a sound practice to reformulate one's goals from time to time, in light of recent experience. This thinking serves as a stimulus toward understanding the boundary reaches of the field; as well as an impetus to understand appropriate communications media. The stated objectives can serve as a check point, providing balance to the open classroom's student-centered learning.

WHAT MAKES AN OBJECTIVE? 2.3.1.2

An objective might have these parts; a clear, descriptive statement, couched in terms of what the learner will understand or be able to do; why the aim is important, what it relates to; likely means for accomplishing the goal (i.e., exercises, lectures, reading, etc.); and a test for determining whether or not the objective was achieved. Usually included with the test is a statement of standard--what degree of accomplishment of the objective is anticipated.

GUIDELINES FOR DEVELOPING OBJECTIVES 2.3.1.3

Several questions, asked during the objective-formulating stage can be helpful:

- What will the individual be able to do when this course is finished?
- What does the audience need to know? Want to know? Already know?
- What will the individual be able to do when this course is finished?
- What processes will best help the learning happen?
- What other people know about this field and can suggest objectives, attitudes, and methods? What resources are available to aid the learning?

I hear, and I forget.
I see, and I remember. 1
I do, and I understand.

The essential question for the designer of the environmental education course is, "What is it that the students should start doing?"

PRINCIPLE: START WITH PROBLEMS AND QUESTIONS THE STUDENTS ARE FAMILIAR WITH FROM THEIR OWN EXPERIENCE.

McLuhan and Dewey expressed the principle, when they respectively said, "the medium is the message", and, "we learn what we do"² One of the important functions of the teacher is to act as arranger and manager of those experiences. Establishing a relationship of exploration and testing by students on the learning environment will encourage the formulation of questions by the students. Not only must the students be challenged by the setting to "do" and to inquire, their exploration and questioning must be valued. The Brockton case went further in this direction than did Roxbury, in that the Brockton students were set loose on a problem of their own choice for a lengthy period of time. "Doing" cannot be for its own sake, however; the measuring of the physical qualities of the outdoor environment failed to capture the students' interest, because it did not relate in any way they could see to something they understood.

PRINCIPLE: HAVE THE STUDENTS ACTIVELY ENGAGED IN DOING: ASSURE THEIR "DOING" IN THE LEARNING SITUATION IS LIKE "DOING" IN THE REAL WORLD SITUATION.

Roughly, this principle re-states the proposition that care be

taken to insure that the "stimuli encountered in training be the same as those encountered in the transfer situation",³ an old educational psychology adage. This is another point in favor of using the city as classroom and arranging real contact with real world actors, having the students confront their style, language, and settings. The reasoning here is that the closer the applicability of what the student sees to his or her own problems, the greater will be his or her learning and involvement in the learning. Additionally, the student will have developed the confidence to confront the real world once he leaves school from having done it in a limited way.

PRINCIPLE: THE COURSE DESIGNER SHOULD QUESTION THE PURPOSE OF EACH ACTIVITY, STATE WHO WILL LEARN WHAT, AND DELINEATE HIS OR HER EXPECTATIONS.

The course designer, whether acting prior to the start of the course or spontaneously in the midst of a class, ought to ask these questions of the activity:

- What is the purpose of this event?
- What will be learned? By whom?
- What are the likely outcomes? That is, what would I like to see happen?
- What do I expect will happen?
- What are the implications for my role and the students' role in this activity? Does this contradict any of my stated beliefs?

MANAGING LEARNING: BUILDING THE LEARNING ECOLOGY 2.3.3

In discussing the "articulate consumer" model for participants in the learning process, allusion was made to the recognition one must pay to the "ecology" of the learning setting. I stated earlier that the biggest lesson for me was that the real problem I faced was

not so much what to teach, but how to help the learning happen; meaning that the best laid plans were often run afoul by any number of variables. Yet, I found that successful learning exchanges could happen, with thoughtful attention to these variables.

The concept of a learning "ecology", seemed to capture for me the delicacy and complexity of the learning process in its setting. How this concept evolved is treated in the Roxbury case study.

Like a natural ecological setting, the learning environment has identifiable inter-dependent elements, separated from, but affected by, a larger environment--with energy exchanged (communication) amongst all. The elements are the teachers, the students, the learning resources, and the setting. Each is subject to intra-as well as inter-elemental forces; teachers' behavior is affected by their motivation for teaching, their daily and seasonal mood, their preparation, their culture and their personality, as well as affected by the state of the students and resources and setting; the students' behavior is affected by their families, their age, their peer relations, their daily and seasonal mood, their attitude toward the subject, their personality, their future, as well as affected by the state of the teachers, the classroom setting and the social-economic setting outside the school; learning resources (books, materials, lectures, curriculum plans, field trips, visitors, etc.) are effective when in enough supply, when appropriate to the culture and academic needs of the students, and when used properly by students and faculty. The setting is effective when it supplies light, quiet workspace sheltered from

distractions. It's effectiveness is compromised (or enhanced) by the careful (or careless) use by students and staff.⁴

The learning ecology is bounded by a larger social-economic and academic environment. The outside conditions affect the functioning of the process; ethnic or religious holidays affect attendance, as do weather, seasonal boredom, family problems. On the other hand, turmoil in the setting or in the school can bring in forces from the larger environment; newspapers, police, firemen, security aides. The learning ecology is the setting for energy inter-change (communication) amongst the various elements; teachers, students, resources and the setting. Communication within elements (teacher to teacher, student to student) has a fundamental influence on the basic process of the learning ecology.

The usefulness of the "learning ecology" notion does not derive from any particular control it provides over the variables. The usefulness comes from the notion's ability to inform us of the existence of these variables, so that one can anticipate their changes and resultant effects on learning to some degree. The principles presented below are offered as an aid for establishing a learning process in which the effect of variability in conditions is understood and reduced as much as possible; and as an aid in using any flux to the advantage of the learning process.

PRINCIPLE: INQUIRY MUST GROW OUT OF SHARED EXPERIENCE.

Getting started, in both the Roxbury and the Brockton experiences, was difficult. Having not yet established what to expect of each

other, having not yet built any common experiences, the learning of the first few days or even weeks was mostly about the group, and less about the content. In an authoritarian classroom the bridges into the experience are crossed very quickly; rules and roles are made clear. In an experience where the students' interests are central to the conduct of the experience, it takes awhile to build channels of communication and begin to share common goals. In Brockton, most of the students shared a common motivation to get something out of the experience; in Roxbury, not even this was commonly held. In both cases, the first experience of the course did not encourage the goals of establishing communication and style of inter-action. Students, being asked to start with something they didn't know or value (i.e., the future), had their lack of confidence reinforced. They were starting with something impossible, which lead them to feel inadequate. Illich has written that the kind of "inquiring" that should be happening "must be rooted in a history of shared experience at many levels, and it must grow out of this experience".⁵

Students coming to the course may be motivated to the material or not, but, in any case, they are interested first in understanding what the teacher expects or wants from them. To throw the responsibility for learning right back at the students so early will lead them to reject the style, because it confuses them. A curriculum based on students' needs must first, as Illich implies, build means of communication via shared experience; then those needs can be more easily expressed and mutually understood. I believe that once the

students and teachers have established a pattern and each believes in the other, increasing degrees of freedom can and should be introduced. A little discipline and structure at the beginning, affirms in the students' minds that you, as the teacher, do care for them, and you do respect them. The teacher who enters the high school situation with an entirely unstructured approach is read by the students as lacking confidence, fearing the students, or they see bribery in the offing.¹¹

PRINCIPLE: OPEN WITH CONCISE, CLEAR INQUIRY INTO SOMETHING THE STUDENTS KNOW.

Elements of a successful opening exercise would ask the entire group to write or to describe graphically, something they knew well--like their neighborhood--but would not be done initially for display to the entire group. Emphasis would be on the desire for the student to communicate in a non-threatening way some description to the instructor, and he, in turn, would communicate back to the students. While serving to open the students up, and heighten their sensitivity to what is around them, it will give the teacher a chance to prove his interest in the students and to improve (and prove) his ability to listen without judgment. The idea is to learn from the students' work, and try to lead them to understanding "what is worth knowing", but not to (pejoratively) judge the students' work.⁶

There are arguments for other approaches. It is being widely argued that the "problem must be seen by the students" for them to

actively engage in it. Another suggestion has the students confronted with a question framed in such a way as to lead to an understanding of what's important to them.⁷ Cronbach suggests the central question for curriculum design might be, "what must people know to be an effective part of society?"⁸ Postman and Weingartner argue for an entirely different approach, opening the question-asking to the students, and starting the course discussions from there.⁹ However, I believe it is important to open with some definite ideas to be communicated--like creating a sense in the student for what the style of the course will be, what content will be dealt with, what is expected of the student, and what he or she can expect to learn. Postman and Weingarten have composed a list of questions that are important to building a comfortable setting for learning. They suggest:

PRINCIPLE: 1. Ask yourself; What am I going to have my students do today?
What's it good for?
How do I know?

PRINCIPLE: 2. Avoid telling your students answers.
Direct your questions at issues and particular points, not at evoking the answers to questions which are already known.

PRINCIPLE: 3. Try listening to students; role-play if that helps. Realize that silence may mean thought is in process.

PRINCIPLE: 4. Practice, with the students, asking questions. 10

When, in the classroom setting, students are subjected to questions, they become the subject investigated.¹¹ It is suggested that

the questions be permitted to form patterns, rather than imposing patterns on the questioning.¹² It was observed by the Bremers that teachers spend much energy trying to stop the students from talking; but talking leads to communication, communication to learning.¹³ So, the teacher should look to the inter-action amongst the participants to suggest and give form to the direction of the course.

PRINCIPLE: USE THE SETTING TO SUPPORT THE LEARNING PROCESS.

In building a learning ecology it is important to remember the spatial rules that helped support good inter-changes amongst the students and teacher. When we were spread out over a large area in a classroom, the conversations were strained and always subject to distractions. On days when we all sat around a table, conference style, or stood in a small group, our conversations involved more people and retained everyone's interest longer. When everyone is seated within reach of each other, eye contact is easier to make, and facial expressions become a part of the conversation; at a larger distance, the body cues and eye expression are lost amongst a wider visual field.

It is important to mention, though it will be discussed later, that the students develop a sense of place, a sense of ownership of some territory. The school then becomes "theirs". Use of wall surfaces to display work in progress is one kind of device that worked very well in Brockton. Besides providing a feeling that the classroom was "theirs" (the feeling is akin to being assigned your own office in an organization, for the first time), intra-class communication benefitted greatly.¹⁴

To sum: What are some basic principles important to the evolution of the learning ecology? As the teacher, to be a person, not pedantic authority, remote from the feelings of the students and masking your own; show (and do) belief in the students and their ideas; listen to them; admit when wrong or confused; answer questions directly that can be answered; do what you will say you'll do when you say you'll do it; do as much as you can to learn and keep learning about your "subjects"; the activities, speakers need to be engaged and not merely make the students passive recipients of some knowledge; movement is needed from place to place or idea to idea, with periodic cul-de-sac or quiet corners for a moment or two of reflection before moving off again; subject matter is needed that is either directly drawn from the experience of the students (paying rent, tenant selection or finding an apartment, or use of a school building, or something they knew in one way but desired to learn more about (the skyline of Boston, a student's map of a neighborhood, people's differing ideas on tenant selection practice)).

MANAGING LEARNING: KNOW THY STUDENTS 2.3.3.2

Postman and Weingarten characterize the "good" learner as one who:

- has confidence in him or her self;
- enjoys problem solving;
- relies on self-judgment;
- is not afraid of being wrong;
- tries to gather as much information as possible in making judgments;
- is flexible;
- has a respect for facts, recognizing them as tentative;
- a good learner knows how to ask meaningful questions.

15

PRINCIPLE: KNOW THE STUDENTS AS PEOPLE.

Believing other idealized notions about "good" learners (for example, "the learner and not the subject matter is the reason for education",-Illich¹⁶, and "an informed citizen has the basis for intelligent decision-making",-Roth, Massachusetts Audubon Society¹⁷), we might tend to forget that the students are real people. So, while the objective of the learning ecology is to "create the atmosphere of acceptance, understanding, and respect",¹⁸ it must come to know the students as individuals very well before such an atmosphere can be created. And, in learning about the students, we would find that while they are all capable of learning, personal growth and qualification as a "good" learner are affected by many conditions outside the control of the students and the instructor.

Students' ability to flower as "good" learners are compromised by their previous conditioning to authority; acceptance; the lack of opportunity to develop learning skills; and self-identity. First, efforts in the course must go in the direction of trying to understand the values of the students, where they are coming from, and what their previous experiences have been. It is important to recognize that the students bring to the learning setting needs for affection, peer acceptance, approval from authority, independence, competence, and self respect.¹⁹

To go too far in the structured direction begins to establish the teacher as an arbitrary authoritarian or "flawless moral exemplar". In Roxbury, when the students appeared to be more interested

in gossiping or walking around than sticking with the conversation we had started, I used my proselitizing routine ("If you don't learn about this stuff, you will end up getting hurt...living in poor housing, etc....) At heart was a different kind of issue; these students went through a whole day of school, and I only saw them once. Had I been in their position, I should have liked to goof off part of the time, too. So, it is important to be flexible in applying structure to a setting--one must understand the students' behavior from their own point of view, as much as possible. Maybe goofing off wasn't always so bad.

Once I came to know the students' lives a little, I understood their behavior better, though that didn't mean I was always tolerant of it. The "discipline problems" are only real problems if the teacher feels the students are "strangers; that is, if they could not possibly be your brothers, sisters or children...it is a short step to thinking they are 'animals'"¹⁸ Kohl found that his students wanted to face the difficulties with him, not confront him. This was due to his earlier efforts at building mutual respect.

It is imperative that the environmental education program, or any education program, endeavor to pay great attention to the values of the students, and use this knowledge in directing the course. I asked the students, during one heated and absorbing discussion, to tell me what they would do if they were the architect for a particular neighborhood project. One student replied that she "wasn't gonna be an architect". This taught me to try and remember where these stu-

dents were coming from, what their futures were likely to hold (and warning me to hedge against the development of false hopes and ambitions). The teacher must remember that,

...in spite of the fact that we make available to our youth incredible sums of money, we exploit them, mock their attempts at self expression, and do not provide them with opportunities for living dignified and productive adolescent lives.¹⁹

Peter Blos notes that the most common adolescent pattern in America is,

...uniformism; a turning away from the family toward the peer group culture, acceptance of its norms as infallible and regulatory, and the use of conformity to peer group norms as a means of simultaneously regulating one's own impulses and attenuating family ties.²⁰

This is particularly true of the inner-city youth, for whom there is less likelihood of finding a stable, warm, and encouraging family life.

While the middle-class adolescent is given a secure platform from which to start an identity search, the inner-city poor adolescent has no such base from which to start. Acceptance by the peer group becomes an overriding value to this set. The three women who had children in my Roxbury class were all judged to be "hip" because they were "fast". There was tension added to the Roxbury group (in addition to each individual's search for identity) because the older adolescents and the younger (only a year difference, on the average) were separated from each other by what each thought of as important. The older students disliked the distractions caused by the three

freshman girls, who were always, it seemed, gossiping or complaining or interrupting what we were doing. The older students, closer to leaving school, were slightly more goal-oriented than the younger students, for whom affiliation was a stronger value.

It isn't the exercises alone that help the students learn "competence". They must feel that their work is valued; in this regard, Postman has noted that teachers shouldn't ask questions that they already know the answer to.²¹ Nor should they be judgmental when they should be acting as mediators of ideas and questions. In Roxbury, when I asked questions that sounded like "What did you learn?", I undermined the students' belief that I had confidence in them. In Brockton, the conduct of the open classroom reinforced the students' impression that the teacher did have faith in them. Again, it is important to emphasize the importance of knowing your own motivations as the teacher. I had a need to review what the students had learned; they wanted to move on to new things. My actions were contradicting the learning process.

In Roxbury, I found that students tended to ask questions that seemed to try and confirm reality as they know it ("Doesn't a business own that apartment building?" "Isn't it true that it's hard to evict a tenant?" etc.). Students were afraid to open themselves fully; they were afraid of being "shot down" for stupid questions. I concluded that it doesn't matter much in what form the questions come; every question presupposes certain assumptions and it was always pos-

sible to stimulate more questions by backing up and questioning those assumptions. The momentum of a good session need not be lost with the simple answering of a question, if the teacher takes the advantage by answering straightforwardly, leading to further questions, and not answering with final, definitive-sounding statements.

I found in Roxbury, as did Kohl in his teaching experience, that the students "knew the things they couldn't do, and were grateful that their questions were answered without humiliation."²² So, an objective of the learning environment is to think about and to question specific phenomena. With all the participants trying to help each other answer the questions and with no connotations or qualifications ("That's a stupid question and I won't answer it.").

To sum: While the learner should, indeed, be the center of learning, and not the content,²³ learning should be perceived as relevant by the learner or no significant learning will take place. For the learner to perceive the learning as relevant, he must be dealt with openly and honestly, listened to and valued. Students' motivations and attitudes must be understood in light of each individual's background.

PRINCIPLE: BELIEVE IN THE ABILITIES OF YOUR STUDENTS

"Generally speaking", write Postman and Weingarten, "disadvantaged children are reported to be slower learners than other types of children. If it is true, it simply means they do not function as well as others in the existing school environment. It cannot be inferred from this that disadvantaged children would be problem child-

ren if the ecology of the school environment were entirely different."²⁴
The Bremers also support this notion, writing, "when kids cause trouble, they are potentially the best learners."²⁵ This is an assumption that I worked with in Roxbury, for, as the Bremers have said, "to believe someone is intelligent produces intelligent behavior."²⁶

PRINCIPLE: DIRECT THE STUDENTS TOWARD PRODUCTIVE WORK WITH REAL PROBLEMS.

A principal reason for dealing with education about the environment is that it has a character which is naturally relevant to the learner. The content is something with which we are all familiar. Our earliest development as humans starts from interaction with and control of the environment. Directing the students' scholarship in a productive way, with some responsibility attached to the outcome,²⁷ is likely to aid the individual's growth in important ways.

Whitehead stresses the importance of aiming the students' work toward understanding the usefulness of what they've learned.²⁸ If the individual is taught to be passive with respect to his environment (that is, if this is what is expected of his behavior), then that is the mode to which he is likely to adapt. If he is taught that the environment is passive with respect to him, that he can manipulate it, he may come to believe that notion. Up to recently, Roxbury's lack of development reinforced the image of the residents' lack of power; not only for residents of the community, but for non-residents as well. People inside and outside the ghetto came to believe that rehabilitation is not possible,

especially from within the community. Exercises not only have to struggle with the adolescents' lack of confidence in dealing with an adult world, it must deal with a community's lack of confidence in dealing with a white world. So, while it is idealistically proper to aim toward involving the students in "doing" experiences, these actions must be put in perspective. In this way, the visit to Roxbury Action Program serves as a model for this kind of learning experience--the students looked closely at actual efforts made by people with whom they could identify, who are operating in an environment the students understand and know very well.

PRINCIPLE: MAKE THE SCHOOL THE STUDENT'S OWN PLACE.

Illich specifically makes the point that the quality of the environment and the students' relationship to it will determine how much they learn incidentally.²⁹ I put much more emphasis on this fact than does Illich--I say that the students' relation to their immediate surroundings determines how much they learn. Here is why; the student who passes from class to class, from one grey and dingy box to another, and then out and on to another set of grey and dingy boxes never experiences any care or responsibility for those places he has passed through. Because he never feels these spaces are his own, and for a complex of other reasons, he never really cares any for the school as a place or as an institution. Because he doesn't care for the place, he never has access to the kinds of valuing that the school distributes. He doesn't have "school spirit"; he doesn't

care for the authority; he doesn't view the school as a means of furthering himself, but rather as a deterrent to achieving peer acceptance and some amount of personal freedom. Because of this attitude, which becomes solidly established, the student cannot become Weingarten and Postman's "good learner".

Once the school becomes the students'; that is, once they have a real stake in owning and caring for it, their attitude toward what goes on there will change. A principle that I firmly believe should be strived for is use of the school as a home base, a secure place where a student can keep a few articles that mark his place as his own, where he can have a place that is quiet, that can serve as his "office", if that is how he wants to use it. It is as important to have such a place as it is important what goes on there. In Brockton, the students worked amongst much noise and confusion and crowding, but they had a place where they knew it was okay for them to sit and ponder, drift in reverie, or spread out their work. They were expected to determine how time was to be spent, and to decide how to organize themselves in relation to the setting.

MANAGING LEARNING: EVALUATION 2.3.3.3.

PRINCIPLE: EVALUATION IS IMPORTANT, CONTINUOUS, AND DELICATE.

It is important to realize that evaluation of the students is likely to have effects on the students, merely due to the monitoring. Thus, it is important to take care in observing the classroom, learning as much as is possible unobtrusively about the students. It is important to understand the students' attitudes and behavior, as well

as the results on any "objective" tests, for all are inter-dependent.

One must look at the classroom experience and observe what the students actually do--in McLuhan's terms, the "massage". At Roxbury Action Program, the students were asked to observe and to form a judgment. When we visited the Housing Innovation management people, the students let themselves take on the role of prospective tenants. When we looked at the skyline, they became navigators of a passage through a familiar, but unfathomed, sea. They didn't allow the questioning to go any faster or slower than the rate at which they could digest what was being discussed; they didn't stay in any one place, but kept moving from one related topic to another. In the traditional classroom, the students are listened to but not heard:

...mostly they sit and listen to the teacher...
they are required to believe or pretend to believe in authorities...they are required to remember...they are almost never required to make observations, formulate definitions, or perform any intellectual operation beyond repeating what someone else says is true...it is practically unheard of for students to play any role in determining what problems are worth studying or what procedures of inquiry ought to be used. 30

As teacher-manager, one must insure that the classroom's message is consistent with the learning objectives, and the guidelines for the process.

The Roxbury evaluation interviews were also learning sessions. They were learning experiences for me (to understand what the students knew and didn't know as a result of the course) and for the students (giving them a chance to learn answers to questions that

troubled them). Evaluation does not have to come just at the end—these personal interviews would have been helpful earlier in the term, for each of us to learn about each other in a deeper way than we could through the classroom contact; and we could have established better understanding of each other's motivations and needs and interests. Postman and Weingarten pose several questions that are useful in the evaluation of a learning activity:

- Write your reasons for evaluating students;
- Write your standards for quality; study the reasons you give in assessment from the perspective of the students;
- Have you made explicit from the beginning what you expect from the students?;
- Ask yourself, to what extent does my background block my understanding of this student?;
- Are my own values greatly different from those of this student?;
- To what extent have I made an effort to understand how things look from the student's point of view?;
- To what extent am I rewarding or punishing the student for his or her acceptance or rejection of my point of view?;
- To what extent am I rewarding the student for just saying what I want to hear? 31

To which I would add these:

- What did this student know before he came into this class? How do I know this?;
- In what ways has this student changed?;
- In what ways have I changed?;
- Did the space or events around us influence the learning experiences?;
- Did we cover the objectives for the course? How closely did the students come to expected gains? Why were some objectives achieved and others not?

MANAGING LEARNING: THE TEACHER AS LEARNING RESOURCE 2.3.3.4

PRINCIPLE: ESTABLISH YOUR REASONS FOR TEACHING AND YOUR MEASURES OF SUCCESS.

In realizing the role one is to play in the classroom ecology, it is important to understand well your motivations for being there-- what kind of teacher you expect to be; is popularity with the students important to you; are you excited about the material (why and why not); etc.

For myself, there was the appeal of working directly with young people, the challenge of the setting, and the desire to communicate some knowledge. These motivations imply a particular kind of model for teaching, and it is essential that the assumptions and implications of the model be traced out before the experience begins. For example, architects are not educators; if a design professional goes into a classroom for the sole purpose of "communicating some knowledge", then the appropriate role for him is as a resource person (describing or explaining some particular phenomena; answering directed questions), and not as the mediator of learning. He has too much invested in one point of view; the teacher must be able to recognize and be open to exploring the directions in which the students evidence interest. melding these with what he or she judges important.

From knowing your motivations, as teacher, should come standards for measuring success. Most everyone who read my outline for the course in Roxbury commented how ambitious it was; and most everyone also said it was important to try for what appeared to be impossible.

Having gone through the experience, I could not ever again teach with such optimistic goals or measures of success; My disenchantment about the worthwhileness of trying to teach, where those efforts seem to have impact on only a pitifully numbered few, lingers. Kohl, with similar feelings, asked, "Why give a good learning experience to students, when they are only going to go back into situations that aren't supportive of learning?"³² I have not resolved this dilemma for myself; but had I known my motivations and expectations and thoughtfully composed some measures of success, my attitudes might be less ambivalent. In other words, I made it hard for my own growth and satisfaction by being unclear about measures of success.

PRINCIPLE: DON'T BELIEVE, OR ACT, AS IF YOU WERE FLAWLESS.

From my own experience, and from review of the literature, it can be advised that the basic trap to avoid is the establishment of the teacher as "flawless moral exemplar. It is only in the world of "Dick and Jane" that the always right and righteous people exist."³³ The teacher must be able to say that he is wrong or sorry;³⁴ it is all-important in reinforcing belief in the students as human beings, by trusting them with openness.

PRINCIPLE: OPEN THE COURSE WITH HONEST APPRAISAL OF WHAT YOU EXPECT/WHAT STUDENTS CAN EXPECT.

Kohl approached the building of the learning ecology quite distinctively the second year that he taught; he presented the students with their average test scores on math and reading. This action resulted in shock and disbelief amongst the students; it fired them up,

not in anger at the teacher, but at the system that had labeled them as slow learners.³⁵ It motivated the students to gain some skills. They set reasonable objectives for themselves, which they easily exceeded. In Roxbury, I tried a similar kind of motivation, confronting the students with the reality which they knew only too well--"If you don't understand what is going on around you, you can't control what happens to you." This view is heavily value-laden (my middle class, idealistic beliefs say: 1) "knowledge is power"--contradicted by the students' realization that, as young people acting on their own, there is nothing they can accomplish, 2) that it should be important to all people to control what happens to them). Indeed, it should be their choice as to whether they want the hassles and responsibilities of self-control. Perhaps the view that the Roxbury and Brockton students held--that "there is nothing you can do"--really remains the best attitude, in light of the world they face. (I don't believe this; I believe it is important to have control). But all views are value-laden; in teaching, it is important to get those ideas exposed to the client so that they can judge the meaningfulness for themselves. I tried to be honest about these assumptions with the students.

Opening the course with an honest appraisal of what the teacher expects or wants to learn, sets the teacher's role as less than authoritarian, something more like "chief learner". Bremer has written that this aids in managing discussions and disagreements; the teacher, from the beginning, is "on the side of the students".

PRINCIPLE: IN BUILDING THE LEARNING ECOLOGY, SHARE LIVES WITH THE STUDENTS.

In the process of building the learning ecology, the teacher learns a lot, as do the students. Usually, this learning, made by people about each other, remains hidden. In Roxbury, this was not the case; the students shared their lives with me and asked that I share mine with them. It is especially important to understand why the students wanted to share their lives--for "attention", of course, but more; for being able to talk with, and be listened to, by an adult--a person with whom they could share their ideas and thoughts safely (see earlier discussion of adolescent needs). Thus, it becomes important to the students to know about the teacher as a person (for example, the students, on a number of occasions, expressed the desire to visit my house, to meet my girlfriend, and so on). I believe, with others (Bremer³⁷, Kohl³⁸), that sharing personhood in these ways is essential for building and maintaining a successful learning environment.

PRINCIPLE: CAREFULLY WEIGH--BUT DO--CHALLENGE STUDENTS' BELIEFS AND ATTITUDES.

While it is usually important not to push goals or values on the students, it is as important to be prepared to challenge some of these beliefs and attitudes. For example, students don't usually like to be challenged to use their imagination--"they prefer that there is always a right answer".³⁹ Some students prefer rules and are insecure without them; in any case, the teacher must understand the limits of the student, but might consciously set out to confront limits as a learning

objective. In keeping with the principle of treating the students openly, the faculty's agenda--what he thinks important, and why--should be shared with the students.

PRINCIPLE: EXPLORE AND LEARN WHILE YOU TEACH.

Kohl has written that,

...there is a need for serious, thinking adults who can explore and learn while they teach, who know that to teach isn't to empty the subject of content or complexity, but to reduce and present themes that are accurate, honest, and open to development...requiring subtle understanding and careful work. 40

Postman writes that the teacher should perceive the material as a learner, too, and not as the "teacher". In both Roxbury and Brockton, the teachers treated the material in this way. Mr. Beals had to learn much about city planning and architecture, supplementing his well-developed understanding of ecology. He and the students recognized that he wanted to learn, too. My teaching in Roxbury gave me the chance to learn about the community and just how planning and architecture are working to create new environments in that setting. The results in both cases was a sense of exploration and shared discovery, adding to the students' feelings of the relevance of the inquiry and the openness of the classroom.

The strategies (activities, pre-planned units, field trips, lectures, games, etc.) one employs in the learning setting will be guided by process objectives (stated above) and aimed toward learning objectives. It is far more important to act consistently with the process objectives guiding the "how", and the learning objectives guiding the "why", than to pedantically use the exercises outlined below, or elsewhere, in the learning setting. It is not too important how the learning comes about, so long as it is based on the student needs and works from problems with which they are familiar; and is guided by prior thought as to what the learning ought to concern. The ideas below are merely to provide a point of departure.

TYPOLOGY OF LEARNING OBJECTIVES 3.1

A process principle, presented earlier, was that the teacher should develop learning objectives such as:

- ...help increase the student's ability to take self-initiating action and be responsible for his education;
- help develop the capability of intelligent choice and self-direction;
- help develop the ability to be critical, to be able to evaluate others;
- help students to acquire knowledge relevant to problem-solving;
- help students to learn to adapt flexibly and intelligently to new problem situations. 1

It is important to assess early, the students' abilities and interests so that changes in students can be understood. As well, this infor-

mation is critically important in formulating activities that are responsive to the level of development, interest, and need.²

While exercises will likely reflect local conditions, and be composed largely of improvisation to fit the ecology of the learning setting, the learning objectives can be (and should be) used to form and to evaluate these exercises.

To get the fullest use of the learning objectives, the teacher should design tests for measuring expected changes in the students' behavior or abilities. The teacher should, as outlined earlier, make explicit his expectancies regarding the level at which students will perform. I also found that having several ideas on how the objectives can be achieved is very helpful in directing spontaneous activities. So, there should be four principal parts to a learning objective: what is to be learned; the rationale supporting its importance; one or several experiences that will help achieve the objective; and a test, to evaluate the learning. Within a specific situation, standards for measuring success should be determined. A typology of learning objectives, gathered from a number of sources,³ is listed below. Objectives are organized into three groups; the first (an introductory level), deals primarily with raising individuals' awareness of the environment; the second level deals with more theoretical issues, such as problem-solving, and seems most successful with students who have engaged in some experience at the first level; the third level focuses on the real world problems, not necessarily, however, beyond the capability or interest of students at either of the first two levels.

Each objective is stated with suggested means for accomplishment (i.e., exercises or experiences) and a test for evaluating achievement. The experiences are more fully explained in the following section.

First Level: Learning Objectives 3.1.1

ALL STUDENTS WILL BE ABLE TO IDENTIFY RESOURCES IN THE COMMUNITY HELPFUL IN SUPPLYING INFORMATION ABOUT A GIVEN PROBLEM.

The usefulness of this knowledge is intuitively obvious.

Means: Each of these students engage in an analysis of their neighborhood; they gain familiarity with use of telephone, telephone book, and city directory. Trips to City Hall and local agencies introduces them to local resources.

Test: In a given situation, students will identify a list of appropriate sources of information.

STUDENTS WILL LEARN TO READ AND SCALE MAPS AND PLANS.

To enable students to understand proposed changes in their environment, they must be able to interpret the information describing planned actions.

Means: Neighborhood mapping exercise, and student-directed re-design of their neighborhood.

Test: The students will be able to identify uses, sizes of uses, orientation, and functions on a land use and an architectural plan.

MAKE THE STUDENTS AWARE OF THE BUILT ENVIRONMENT AS A WORK OF MAN, AND THAT IT CAN BE CHANGED BY INDIVIDUAL AND GROUP ACTION.

One's disposition toward action or inaction as a citizen will depend on one's degree of belief in the changeability of the environment.

Means: Visits to architects, City Hall agencies, local non-profit development corporations, site visits to buildings under construction.

Test: Can the student outline a reasonable strategy for solving a given environmental problem?

TO BE ABLE TO READ THE QUALITIES OF ENVIRONMENTS AND TIE THESE TO PATTERNS OF BEHAVIOR AND NEEDS.

In the process of learning to read environments, people would come to value how the environment is structured--they would be conditioned to question, rather than to accept, the conditions around them. Additionally, the ability would be of use to the city residents over the years--in evaluating what is built around them, using that information to direct what they think ought to be happening.

Means: Written descriptions of the neighborhoods where the students live; walking and observing the city from a high point.

Test: The students will identify the important attributes of a given setting; they will identify the important attributes of a given setting; they will describe the user patterns and relate these to the needs or purposes of the users.

TO BECOME AWARE OF THE INTER-RELATIONS OF THE NATURAL AND MAN-BUILT ENVIRONMENTS.

People should know if the built environment will be safe, comfortable, and stable over time. Understanding how natural forces (sun, wind, rain, and snow, topography, and temperature) affect the built environment will condition them to expecting full "environmental impact" statements from designers and others; and they will know how to interpret such information.

Means: Walking; observing from a high place; talking with an architect on the site of a new building.

Test: Students will be able to correctly relate the effects on human comfort and the built environment of sun, wind, topography and temperature. They will know what kinds of questions to ask if they don't know the answer themselves.

STUDENTS WILL KNOW A WAY TO FIND OUT OR WILL BE ABLE TO IDENTIFY RELEVANT ACTORS IN AN ENVIRONMENTAL CONTROVERSY.

The importance is intuitively obvious.

Means: Visits to city and local agencies, handouts describing the local situation.

Test: In a given situation, students will be able to identify the characters engaged in a controversy; or a means for finding out who they are.

ABILITY TO COMMUNICATE IDEAS EFFECTIVELY TO OTHERS VERBALLY AND VISUALLY.

If the students have a position they wish to make known, they must be able to articulate it to a variety of audiences (local residents, City Council, media, professional planners).

Means: Design your neighborhood; neighborhood analysis; environmental misfits catalogue; visits to city agencies.

Test: Are the students' ideas conveyed to outsiders?

LEARN THAT THE IMMEDIATE SURROUNDINGS CAN BE A SOURCE OF A GREAT DEAL OF INFORMATION.

Like the early explorers of the unknown North American continent, the city resident must be sensitive to the many cues around him which describe where he is, whether the area is safe or not, how to get where he is going, how old the area is, who populates it. For the urban resident who wishes to have some control over his environment, he must be able to read these signs and understand them (i.e., are buildings beginning to deteriorate--why? Conversely, are buildings being kept up--and why).

Means: Course exercises can be aimed at giving students some sense of what the cues mean--for example, a house that has recently installed security windows -- perhaps "breaking and entering" is rising in the area; or maybe the building has a new owner and he is fastidious about crime prevention; extra power service running on the outside of a building (the

house is old, its wiring still working but not adequate for modern appliances. Or, it may mean the owner has some money, but not a whole lot, and is willing to make moderate repairs to make the building liveable. This may tell something about the attitudes of neighbors to the neighborhood).

Walking through the neighborhoods, talking with residents, talking with architects.

Test: Given a situation, students will be able to venture some guess about the ownership, location, population, uses, and so on.

LEARN TO WORK WITH OTHERS IN A SUPPORTIVE WAY: AND TO LEARN TO WORK INDEPENDENTLY AND CRITICALLY.

People will always have to work with others; it would be especially fruitful if the learning situation could operate so that students were helping each other to learn. Working on their own, demonstrating the ability to be self-critical, portends well for the students' chances of being productive in real situations.

Means: Neighborhood analysis; environmental misfits catalogue; design your neighborhood; studying entrances or plazas or similar heavily used spaces.

Test: Is the student willing to ask advice, risk taking a position, and adjust ideas when necessary? Can the student work productively in the group?

GET STUDENTS EXCITED ABOUT LEARNING, INTERESTED IN SCHOOL, CURIOUS ABOUT EACH OTHER.

Adolescents need every opportunity to prove themselves and to prepare for dealing with a complex world. Encouraging them to get excited about learning is not a "mean trick", only to end up hurting students in the long-run, because schools aren't always the best places for learning. If students can find some interests, they will find ways of learning with or without the aid of formal schooling. It remains important for students to learn to value each other, to understand that they can learn validly from their peers as well as from teachers.

Means: Neighborhood analysis; re-design of the students' neighborhood.

Test: Can students find something that interests them? Will they work on it if they do? Will they turn to each other for advice and help? And name of landmarks, nodes, and boundaries of the neighborhood?

Second Level: Learning Objectives 3.1.2

STUDENTS WILL DEVELOP A METHOD FOR GRAPPLING WITH AN ENVIRONMENTAL PROBLEM.

This is one of the central purposes of the course; it should be one of the most lasting elements the student brings away from the course.

Means: Neighborhood analysis; re-design of the students' neighborhood; environmental measuring and mapping.

Test: Given a problem, students will outline a pursuable strategy for solving it.

STUDENTS WILL GAIN AN UNDERSTANDING OF EACH OF THE PHASES OF A PROBLEM-SOLVING PROCESS.

It is important for students to come to understand ways to state a problem, analyze it, bring to it relevant information, and evaluate the work they've done. Understanding the stages will help the students to budget time and resources.

Means: A research problem, such as observing an entrance to a building or to an urban plaza.

Test: Students will outline a plan for action they would take in solving an environmental problem. They will identify involved characters; their relationship; state the problem; identify likely resources for solving the problem; and order the steps they would take.

INTRODUCE THE USEFULNESS OF CONCEPTUAL MODELLING IN PROBLEM-SOLVING.

This tool will help the students to determine the nature of their problem and to enumerate the variables that influence the condition affecting them.

Means: Exercises in modelling an environmental condition.

test: Students will devise a descriptive model of a given neighborhood, relating components of the physical, social, and economic environments.

STUDENTS WILL UNDERSTAND THE PLURALITY OF PERCEPTION, VALUES AND EXPECTANCIES IN ANY PUBLIC ENVIRONMENT.

Students will gain a sense for the difficulty of planning future environments for their city; also, gain increased respect for a process involving communities in the planning of their future; gain an understanding of the city's different cultures; and what each one values.

Means: What will your city be? (Interviewing city leaders and residents). Yellow Pages of learning resources; neighborhood analysis.

Test: Students will describe the values that typical users of a given environment might have.

FACILITY IN USING EXAMPLES AS AN AID IN PROBLEM-SOLVING.

Chances of success in problem-solving are enhanced if the students have some notion of how problems similar to their own have been solved elsewhere.

Means: Environmental misfits catalogue; visits to city and local agencies.

Test: When faced with a problem, students will be able to list and use examples of similar situations in formulating a solution.

Third Level: Learning Objectives 3.1.3

STUDENTS WILL BECOME FAMILIAR WITH POLITICAL AND ECONOMIC DYNAMICS OPERATING IN THE URBAN SETTING.

Students should be at least vaguely aware of the operating forces that create and maintain the urban condition. For example, students should understand the relationship between housing, jobs, transportation, and the poverty cycle. Students should become familiar with the political operation of their city.

Means: Through discussion with community leaders; city agencies; reading.

Test: Students will be able to analyze the political and economic causes and effects of an environmental controversy.

STUDENTS WILL LEARN TO GATHER INFORMATION AND MAKE JUDGMENTS ABOUT THE ADEQUACY OF ITS LEVEL AND NATURE.

In a problem-solving situation, the students will need to have a sense of how to spend their energies in data gathering.

Means: Catalogue of environmental misfits; Yellow Pages of learning resources; students re-design their neighborhood.

Test: When confronted with a problem, students will state what kind of information they think they would need, and how they would find out how much is important.

STUDENTS WILL GAIN INSIGHT INTO HOW SPACE TAKES ON SOCIAL MEANING.

Space is a part of cultural development, and it symbolizes what

we think of ourselves. It is important insofar as pride and care for space are culturally determined, and insight into different cultures can be explored once one understands that space does symbolize social meanings.

Means: Observe the city; talk with long-time residents of the city; read about different cultures than the students' own; see slides and films.

Test: When requested, students will be able to give at least one example of a particular culture and how and why space is meaningful to them.

STUDENTS WILL UNDERSTAND THE CONDITIONS THAT AFFECT DEVELOPMENT.

Leading directly to the goal of more articulate consumers of the environment, the students should understand the conditions that affect development, and how these conditions are dealt with in safety codes, public planning, and architectural practice.

Means: Talking with architects, building and electrical and fire inspectors; studying and reporting on the development of some public and private developments.

Test: Students will identify, given a particular case, these variables affecting development; financing, site conditions, market, legal restrictions (zoning and building codes).

HELP STUDENTS LEARN HOW TO LEARN

Students should carry with them beyond the experience, tools that will help them continue their learning.

Means: Students re-design their neighborhood; class discussions.

Test: Can the students work productively on something that interests them with very little guidance, and report educational gains?

BROCKTON EXERCISES THAT WORKED WELL, AND WHY 3.2.1

The Feedback Days: Periodically, the instructor and students paused in what they were doing and reflected on the direction of the course, how things had gone recently, what the students thought they were learning. The most useful sessions were ones that came in response to a need for communication that the instructor had felt; that is, arbitrary occurrences for these discussions were not as useful as ones that were tied to a rising tension or obvious discomfort.

KEY POINTS:

Maintain a device for exploring (mutually) the course's progress. Use it sparingly, and not arbitrarily.

Lectures by the City Planner and Regional Planner: Though the students described the lecture format as boring, they gained quite a bit from their exposure to "real" planners. The student learned the difficulties of dealing with vested interests, of being a mediator between powers, of trying to identify your constituency, and the

confrontation with the apparent "locked-in-ness" of the system.

KEY POINTS:

The planners who spoke with the students were the decision-makers in their respective agencies. The students, therefore, gave the speakers quite a bit of credibility. It is important, when bringing in outside people, to assure that they can address the students in terms they can understand, deal with issues the students can find some interest in, and be able to respond (openly) to the students' questions.

The Design Projects: They were by far, the most fruitful of the experiences in which the Brockton group engaged. Students, with the aid of the instructor, developed projects that pairs of students worked on through the Spring term.

KEY POINTS:

The project ideas were pretty much student-initiated and student-supervised; the students were responsible for how they spent their time, and this established the feeling that the instructor had faith in them; students who were skilled, aided students who weren't in particular areas--with enough skills spread around so that almost everyone was an "expert" at something; student critiques of student work shared learning, spreading around the insights from each of the projects. In leading such an activity, one must be cautious about sending students into too loose a framework without any prior faith building--since they are very unused to that style of learning (in a school, anyway) and they must be convinced that they can do it.

ROXBURY EXERCISES THAT WORKED WELL, AND WHY 3.2.2

The First Visit to M.I.T.: The students gained most from exploring the unfamiliar territory, shapes and facades. By the time they got to talk to people (architecture and planning students); however, they were worn out.

KEY POINTS:

The students learned from being exposed to the unfamiliar, and being able to ask questions about it, thus, demystifying something strange and unknown. (Barely are they encouraged to do this). Arranging too much was not good, though, for it taxed their physical capabilities and interest.

The Second Visit to M.I.T.: The intended activity, to have the students raise questions and ideas with M.I.T. planning professionals, failed to happen. A long delay in getting started (due to the late arrival of most of the invited guests), wearied the students and caused them to become impatient. As an alternative, I asked the students break up into groups and work with the M.I.T. people, once they arrived, in "re-designing Dudley Station."

After about forty minutes of drawing and talking, we all gathered together, talking about the similarities and contrasts between the three groups. One group attempted to draw a land use map of the area, but wasn't able to construct an accurate map by locating streets, so it got started by remembering landmarks. One of the students in the group lived in the public housing project near the station, and she

became involved in detailing that part of the map. Another student realized that she blanked out certain things as she walked to school every day; she was surprised by how much she remembered once other details started flowing. One group talked about the things they liked (of the variety of stores, lots of people of different kinds, sidewalk action, the stores and the busses and the trolleys all conveniently located). Commonly, all the groups said they didn't like the people who "hung out" at Dudley, nor the stealing and pocketbook snatching, busses not running on time, double parking, the bars, burned out shops, and the drugs. People said they'd like to see street art, removal of the elevated train, more trees and open space, and a teen center. Some of the students felt like the exercise was a bore; others felt that it had opened their eyes to things they had taken for granted.

KEY POINTS:

The size of the space we were in (it was way too large; it intimidated the group and allowed everyone to spread out too far for easy conversation) and the late arrival of the guests set a poor mood for the exercise; but once underway, the students became involved. The exercise was good because, while it gave the students some (new) mapping skills, it used their ideas and perceptions of an area which they all knew. They were encouraged to express their opinions, because they saw the importance of having different ideas. And students could see the "results" of their work--some of the learning was abstract, but a good part of it was represented in the maps the

students had made.

Public Facilities Department, Boston City Hall: The entire trip (the walk to the subway, ride on the trolley, walk to the City Hall, and lunch together) was a good experience. The students explored unfamiliar territory; on the way we stopped here and there to talk about the history of Boston, the topography, the use of particular buildings and how they were built. The discussion with the PFD officials was very good--many questions were asked. They wanted to know why so many buildings were left unfinished (the HUD Infill project); why the new firehouse was built in Dudley Station; why the PFD continues to build new buildings in deteriorating areas. Everyone spoke up, and they had the opportunity to look in detail at what the new campus high school project would be like. Not all of their questions were answered, and they learned something from that.

KEY POINTS:

We became more of a 'group' for having shared these experiences (as opposed to having the students go visit City Hall on their own, much more was accomplished). Questions were stimulated and allowed to flow--students saw familiar turf in new light (through maps and models and political-planning framework). A bad feature of the trip was that there was too much to do, and several of the students tired easily.

Neighborhood Mapping: Working together over some tables that were pushed together, people really opened up, talking and asking questions.

Most people watched and commented as a few drew maps and talked.

KEY POINTS:

The drawing activity was novel for most of them, but seeing others do it, eased some of their apprehensions. It provided them with a new look at a familiar thing. Sitting conference-style rather than at desks, also encouraged a conversational atmosphere. Unlike many other days, there were no drifters in and out of the classroom, causing distraction.

Talking About Problem-Solving: I tried to have the students think about the problem of presenting questions and thoughts (their own) to people (students and professors) from M.I.T. For several reasons, the conversation went nowhere at all; the problem wasn't a problem to them; and why should they want to talk to M.I.T. people--just because I wanted them to do so? Problem-solving was abstract and just wasn't something they could 'see' usefulness for, nor was it something that actively 'grabbed' them.

I kept trying different ways of approaching the issue, until finally, the students began arguing with each other about housing management policies. The ensuing discussion was so absorbing that everyone stayed halfway through the next period.

KEY POINTS:

The class was flexible enough that I could keep trying different ways to stimulate the students, getting them to ask questions about something that bothered them. The students took over, arguing about things

they knew worked and didn't work, things that they saw every day. They found out that other people had similar ideas as they had. There were no distractions; we were able to talk without interruption until the conversation played itself out.

Roxbury Action Program: The assistant director of the non-profit development corporation explained some of the history of the Roxbury community--how it was first a settlement for rich people, later, a home for industrialists, who could look down from their mansions on the hill to their factories below. He spoke of how it came to house so many of Boston's poor and black. He talked about what RAP did, and how the staff was supported (from the non-profit pharmacy and the management of housing). He spoke of the shared belief of the RAP staff that people who live in the area should own and manage the neighborhood. All the staffers, he noted, live in the area and contribute part of their salary to a fund supporting the RAP program.

The assistant director, a dynamic and intense speaker, wove a strong presentation. The students understood him well. Other than the mis-behavior of two of the freshman girls (they were missing a fashion show at school and wanted to hurry back), the session went very well. Students asked, "Why do people break windows in houses... and why do you fix 'em if you know they'll only get busted out again?" Answers were forthcoming to each of the questions, and they were very different than what was said at City Hall; RAP, it was explained, was building a community, which meant physical as well as social design

and construction--if people are trusted, if something is theirs, they will respect it and care for it. It was clear to the students that RAP had a cause (self-determination and Black awareness) which seemed to inform its work (unlike either of the city agencies visited).

One of the students said that he didn't think that people would take out each other's garbage and keep the yards clean. The others agreed. The resulting discussion revealed an apathy, a lack of hope within the students, while the RAP staff exploded with assaults on the students for their lack of belief in themselves and in what could be done. The staff explained, not how things would work in the housing, but how they are working. They explained their philosophy, and then talked about the specific means they are using to build the community (cooperative stores, community centers, physical and social services). The kids learned how tenants are selected, and what the manager is legally allowed to do and what he is supposed to do. In all, the discussion was the best we had all year for dealing with assumptions, beliefs, hopes, reality, and how to reconcile those with the whole system.

KEY POINTS:

The students heard the representative of the development corporation talk about things with which the students were familiar; referring to an area which they knew. He listened to their questions, answered them, and challenged them to think.

View the City: From the top of the school (the cafeteria was located

on the fourth floor), we looked at the Boston skyline, the districts of the city, with Roxbury in the foreground. The students' questions never stopped. They asked about building codes; building ownership; why the windows fell out of the Hancock building; how were high-rise buildings designed; how jets stay up in the air; what M.I.T. is like; why cars can't be propelled like jets.

The discussion was one of the best we had all term. We were all asking each other questions, pausing and thinking while someone else said something. It was just the right scale for five people; the line we made along the window sill gave us the chance to see each other's faces in close detail as we spoke. Eyes could easily drift over the cityscape. If there had been twice as many people, however, it might not have worked so well. The session was good because simple questions led to explanations about many things (example: "Doesn't a corporation own that building over there?", led to discussion about non-profit development corporations, depreciation and tax shelter, the economy, and the role of banks in helping shape the face of the city).

KEY POINT:

The vantage point literally gave a new perspective on a familiar thing. The small group functioned nicely, not being distracted by drifters or whatever. The open setting encouraged student questions.

WHAT DIDN'T WORK WELL AND WHY: BROCKTON 3.2.3

Ideal Future Brockton: The first exercise of the term, the students were asked to project what their idea of future Brockton (the year 2000) looked like. They thought that "their opinions weren't important" enough to warrant their full interest in the problem, and because the students thought they really ought to study what it will be like, they forced a shift from the planned activity. The management of the exercise failed to bring out the importance of values and value differences in the planning of the future, or the difference in values represented by what the students thought it ought to be and what it will be.

KEY POINTS:

Early in the term, there is a need to start with something concrete, an aspect of the world with which the students are familiar. In such an exercise that aims to discuss values, the instructor may have to develop analogues to the planning situation, so that the students can understand the importance of this kind of thinking.

Modelling, Measuring, and Mapping the Environment: The instructor presented his own model for explaining the structure of the man-environment system, rather than deriving such a model from the observations of the students. Thus, the "measuring" part of the exercise was not conceptually or operationally linked to the model--encouraging the net effect of students being turned off to data collection that made no sense. The mapping and display of this data, intended to synthesize all of the thinking and diverse efforts of the class, had as a result,

no prior (sensible) basis from which to draw.

KEY POINTS:

The plan for the exercise should have been more descriptive of intended results and reasons for actions; additionally, the instructor and designer of the exercise should have worked more closely in the evolution of the activity, helping both the instructor and the students to see the usefulness of the planned actions.

WHAT DIDN'T WORK WELL AND WHY: ROXBURY 3.2.4

Future Roxbury: Asked to project what their ideal future for Roxbury would be, in the year 2000, the students couldn't respond because they didn't know what was expected of them, and so early in the term they were fearful of exposing ideas. The ecology had to be developed first. Additionally, their hopelessness about the future and their cynicism about what an individual can do, prevented the students from feeling the exercise was worthwhile or useful.

Preparing for Field Trips and Reviewing Afterwards: These discussions generally failed to stimulate interest or involvement because the students felt that what they learned was obvious and they would rather get on with learning than spend time repeating what they had learned.

Lecture on Electrical Plumbing and Structural Systems: The students were interested in how these things work, but it would have been far more effective to look at a building under construction, or at least observe the operation of some of the things we had talked about, rather

than using handouts. The diagrams I drew were helpful, but not as interesting as the real thing.

State House: The tour was very boring (some young woman raced us from painting to painting. She didn't know much about the legislation process at all.) Coupled with the fact that the freshman students were tired when we arrived there, the state representative we were to meet never showed up--so, the trip was dismal.

SOME QUESTIONS AND IDEAS FOR INITIATING LEARNING ACTIVITY 3.3

To start, have students write down all the questions they want answered about anything related to the environment (cities, highways, trees, new buildings, old buildings, planning, MacDonald's hamburger stands). Asking people to describe their favorite space can be an aid in getting them to open up. Students may not at first feel comfortable about revealing themselves in this way, so the communication might best be channeled between the individual students and teacher. Discussion can be generalized, from unnamed cases.

Have people each describe a place they all know.

Take a trip to a high place; look at your city.

Ride on public transport. Describe the experience--the things you see, the problems users might have, etc.

Play a game where the students have roles as different actors (developer, city council, architect). Use an area of your city with which students are most commonly familiar.

Have students catalogue the environmental misfits they spot.

(A building that looks too big, creating too much wind; a highway cutting off part of the city; an industry along a waterway; large asphalted areas, etc.) Organize the misfits and talk about what can be changed, and why the conditions should be changed.

Visit the Urban Redevelopment agency in your city; have the planners talk about what has been done, what is underway, and what is planned. Ask about how the office operates, and the kinds of skills the staff represents. Find out where the financial support comes from and who the agency's clients are.

Visit your city's housing authority; have them explain the goals and problems; visit a private housing manager; ask about their goals and problems. And visit a non-profit corporation for housing, determine their goals and problems. Compare the three experiences.

Talk to a banker, and ask how real estate mortgages work, to whom they are given, what effects they have, how mortgage decisions are made. Have him explain how the larger economy affects construction in your town.

Visit an architect; have the operation of the office explained, and what the architect does defined. Follow a project through the office and out to the site.

Talk to a rental agent; have them show you an apartment or house. Have the rental steps made clear, and talk about the constraints on the agent and what is sought in tenants.

Talk to your school's janitor, having him explain how the building is heated, when the additions were built, if there were any, the

problems he has with the physical plant, and what he would change if he could.

Have the students keep a daily chart of the places they go to and how long they are there; discuss how and why there are differences amongst people in the class, what this means for a scale as large as the city.

Interview a small neighborhood store owner, a store manager in a shopping center, and a store manager in the central business district. Compare their views on customers, location, prices, business practice.

Interview some elderly people who have lived in the city for a long time. Ask them to discuss and compare "now" and "then"--when they were the students' age.

Look at the classroom in which you are meeting. Ask yourselves, "What is this room supposed to do? What actually happens here? What are our feelings about the place and what do we do here? Does this affect what we do in any way?"

Unobtrusively observe the entrance to a supermarket or other high pedestrian volume store or space. Describe the behavior of the people, and how it appears to be channeled or conditioned by the environment.

After the group is well established, encourage the students to try analyzing and re-designing their neighborhood. Try to maximize the student to student interaction by having students help each other to answer their questions.

Some questions they might ask of their work:

-How is the neighborhood defined-what are its boundaries? Are there any focal points?

-Where is the shopping? recreation? Are these important? Who lives in the neighborhood?

-Do the residents know a few or lots of neighbors? Why?

-What services are in the neighborhood? What services are in need of improvement?

-Do adults use different spaces than young people?

-What did this neighborhood look like twenty-five years ago? What about twenty-five years hence?

-What kinds of movement in and through the neighborhood are there?

-What caused the topography to be the way that it is?

-List adjectives describing the place.

-In what ways should it be changed or preserved?

-How do your ideas compare with other residents for the area? How do they compare with the city planners' ideas?

APPENDIX - A CASE STUDY IN ENVIRONMENTAL EDUCATION:
BROCKTON, MASSACHUSETTS 1973

BROCKTON: THE AREA; THE SCHOOL; MY ROLE

1.1

Brockton, located about twenty-five miles south of Boston, has a population of approximately 89,000 (1970 census). The population is overwhelmingly white, with only traces of ethnic groups in the settlement. The average age of the residents is low (27.8 years, even lower than Boston's 34.8), supporting the notion that Brockton is a place where young marrieds settle while they raise a family. The town's growth has largely been suburban over the past few years, with many apartment developments sprouting up outside the central business core. Brockton services its own population adequately with jobs, general services, and supplies. It appears to provide a regional locus for general retailing. The median income is slightly above \$10,000.¹

In mid-summer, 1973, the Brockton High School Quest Program ("Quality Urban Environmental Studies Training", a set of courses within the high school, focused on the natural environment) requested aid from M.I.T. in developing an experience linking studies of the built environment to the Quest program. The formal request called for a one year unit called "Multiscale Image Modelling of the Future Built Environment". The summer months (1973) were to be spent reviewing the existing Quest program, defining specific objectives for the course, and constructing a pilot curriculum to be taught in the fall.

Brockton High School houses 5,000 students. It has extensive grounds and facilities; built in the late 60's, the building is equip-

ped with a television studio, observatory, and even a restaurant (run by students). The Quest program is a federally funded (Title III) curriculum in the school; it has a director and three full-time teachers--a biologist, a social scientist, and a mathematician. Mr. Gerald Beals, the biologist, was the primary instructor for this course. Having several years' experience in teaching high school biological sciences, he harbored a growing interest in seeing some teaching at the high school level link planning for the future with concern for the natural and man-built environments. Mr. Beals had the advantage of being familiar with the students who would be taking the course (he selected them) as well as long experience in teaching. My role was to develop the curriculum materials; provide aid once the course got underway; and, in general, to act as consultant to the teaching and learning process. About once weekly through the term, I traveled to Brockton, and spent time with Mr. Beals and the students. On some of those occasions, I gave presentations in the class. Two or three times during the week Mr. Beals and I would speak by phone, redesigning exercises to conform with the interest and pace of the students.

The course was designed as an experience for students who had already gone through the Quest program and were ready for more advanced independent work.

The course development produced a set of exercises and a calendar of activities, as well as learning objectives, for the course.

skills:

"to help the students develop a method for systematically solving an environmental problem..."

"to teach the students facility with the concept of scale..."

"to strengthen students' ability to express ideas in graphic form..."

concepts:

"raise the students' awareness of the components of the total (scale and time-wise) physical environment..."

"to become aware of the inter-relationship of natural and man-built environments..."

"to help the students discover insights into how the physical environment and behavior are related..."

"to teach that utopian thinking has its value in city planning practice..."

"to illustrate that people have different perceptions of the same physical environment..."

"to familiarize the students with modelling (structuring a description of the salient features of environment and how it changes over time)..."

"to teach the students to understand that space takes on social meaning..."

student-focused objectives:

"to 'loosen students up', help them feel confident in expressing their ideal image of the environment..."

"to strengthen individual confidence in evaluating the quality of graphic and conceptual proposals of others." 2

The course design set out to help the participants obtain a "whole" knowledge about man and the environment. From the preparatory Quest program the students developed curiosity about how the "green" environment and the social environment worked; to "complete" their "education", it was necessary to teach them about how the man-made environment affected man and interfaced with the natural setting. It was assumed this "whole knowledge" would help the students formulate career and citizenship objectives, and aid in understanding the operation of the world around him once he left high school. Implicit was the assumption that the students would have cause to use this knowledge once they left school - and perhaps even while they were in school.

No overt effort was thought necessary to help the students see how relevant this material was - nearly all shared a general interest in exploring what the course was offering. Their prior interest, previously obtained background, and school focused on their world, were all benefits in assuring that students' commitment was high. As this study tries to demonstrate, it is simply not enough to just bring together students who have an interest or skills; the program must actively respond where necessary to the needs of the participants.

The objectives were to be achieved through a series of linked exercises - starting with an introduction of the students to the material, to each other, and the faculty to the students. The first

steps taken were aimed at assuring that the students shared an understanding of what the course would deal with and how it would proceed. The first "exercise" had the students state their "Ideal Future Brockton". The experience was expected to raise lots of questions and apprehensions in the students. The next exercise "Modelling/ Measuring/Mapping the Physical Environment" was meant to step into the confusion in a natural way and offer a means for organizing the problem of understanding the environment (via the modelling section); a means for understanding the problem (via the measuring section); and a means for describing the problem (via the mapping section). The course was then to look at the phenomena of why and how the physical environment has meaning to people - an activity which was supposed to raise questions in the students' minds about behavior and its relationship to the physical environment. Having dealt with a range of constructs about the environment and skills describing how it was used and structured, the students were then to be lead into a design activity, bringing together all that they had seen, heard, learned and already knew. The students' "designs" for their neighborhoods were to direct each into a period of time during which they would plan their own explorations and carry them out with the help of the teacher and fellow students. (see Schedule, page 103). The initial plan only provided us with something from which to improvise. Some of the learning we desired happened as we expected; much learning occurred that was unpredicted and can only be understood in retrospect. The following section describes the content of the planned activities and what actually happened.

DISPLAY 2: SCHEDULE OF PLANNED ACTIVITIES, BROCKTON

PHASE	LESSON	DURATION
Introduction	<u>Future Brockton I</u> : Students state their ideal future Brockton.	11 days
	<u>Make the learning visible</u> : students display work. Feedback from faculty to students	2
Modelling/Measuring/Mapping the physical environment	<u>Modelling</u> : define "model". discuss use in everyday life. talk about various models of the physical environment.	3
	<u>Measuring</u> : determine wind, sound, air temperature characteristics for an area. discuss implications.	3
	<u>Mapping</u> : display the recorded information. discuss implications.	3
	<u>Synthesis</u> : presentation by MIT lecturer on symbiotic relation between the natural and manbuilt environments.	3
The physical environment means...	<u>Mapping your home</u> : students diagram their homes. Discuss differences in perception; in use of the physical environment.	3
	<u>Mapping your neighborhood</u> : students diagram their neighborhoods, leading to...	3
	<u>Neighborhood analysis</u> : where comparison is made amongst students' definitions of neighborhood; characteristics; problems.	5
Behavior and the environment	<u>entrances</u> : students observe and analyze an entrance to a building. discussion about the relation between physical environment and behavior.	5
	<u>reading</u> : behavior and the environment. reinforces learning from observation exercises.	4

Display 2: Concluded

The future environment

design your neighborhood: going from neighborhood analysis will aid each other in formulating a redesign for their neighborhood.

10 days

Whither Brockton?: having developed some ideas about how their world ought to be, the students will interview citizens, politicians, businessmen, to discover where others think their town is going.

Independent activity

environmental encyclopedia: students look for situations that need correcting; resources that can solve problems. environmental controversy game: role playing, simulating the development of a part of the environment. minicourses on mapping, scaling, further neighborhood design.

25

As intended, the initial days of the course were spent gathering information about what the students expected from the course and gaining information about their backgrounds. The objectives and operation of the course were explained and the importance of keeping a journal of thoughts, reactions, etc. was stressed. Combining the log entries with what we knew of the aspirations and life experiences of each of the students helped the faculty to sort out weaknesses in the course. Said Mr. Beals, "If I didn't have the logs, I might not have learned as readily when the students were getting frustrated."³ Nine students elected to take the course. They were juniors and seniors, most with an interest in or experience with planning or architecture, and all were from lower middle class or middle class homes.

The introductory session was supposed to get the students thinking about their classroom space - and the classes' needs. We had established as a procedural guideline that students were to have wall space to display their materials and a permanent desk area where they could leave their work from day to day. The use of the walls worked well,⁴ but the storage and work areas were never created. The use of the classroom as a learning tool wasn't capitalized on--there were several space misfits--students wasting valuable class time and energy looking for their drawing or books; crowded work surfaces, people having to work on top of each other. Very little was accomplished by this discussion; it came too early, was too loosely handled, and

administrative hassles intruded.

The first exercise had the class draw or write what they thought their "Ideal Future Brockton" would be like in the year 2000. The purpose was to begin creating a learning environment where people felt comfortable about stating their ideas, and to illustrate what the students valued, serving as a benchmark for further development. The discussion was aimed at learning from the students' work, not by criticizing it-but by searching for ideas, commonalities, and so forth. The exercise might have worked well had it come later in the term, but at this point the students hadn't yet developed trust in the group, and they didn't believe this information was relevant or important to anyone. They believed that if they were really to deal with the future they should be studying what it will be like, since that was more "likely" than their wishes.⁵ The students shared the belief that "there's not much you can do to control your future". Though the discussions went well, and began opening paths of communication, the students found the exercise difficult and confusing.⁶ Our approach evidenced belief that people could influence their future; that was a principle underpinning of the course.

* Rather than moving into the planned activities (examining what "will" Brockton be, as opposed to what the students thought it should be, and a discussion of utopianism) the class spent about two weeks overcoming the skill deficiencies (concept of scale; reading plans and maps) that were uncovered by the first exercise.

The students' discomfort with the first exercise led the instructor to invite in outside speakers (the city planner, and a regional planner) who talked about the planning process, the operation of their offices and some of the difficulties of formulating plans ("influence of vested interest groups", "knowing your constituency.") While some of the students felt the talks were boring, all of them reported gaining a lot from contact with "real" planning professionals. For instance, the instructor reported the students were depressed by confronting the "locked-in-ness" of the system, that is, how difficult it is to bring about change.

Periodically, the course design scheduled "feed-back days", when the students and faculty would reflect on how the course was progressing. Early in the term, these were ineffective because the students wanted to "get on with things". They later proved their usefulness, however. One such session at mid-term was very effective in revealing the students' feelings. As a result of that session, the instructor altered the course plan entirely and went into "design activity"--work on individual student projects.

What led to the students' dissatisfaction was a series of exercises designed to illustrate the importance of "modelling" (defining the elements and structure and process of) a situation. The students collected temperature data along one contour line on the school site. This data was to have been collected after they had developed a conceptual model of key variables in an environmental setting. Their

model, once invented, could then lead into discussions of how design professionals used this information, what other models existed, etc. However, the instructor presented his own model, along with several other ideas (McHarg⁷, Fitch⁸) and as a result, students never gained a sense of the importance of arraying environmental variables to help describe a setting; nor did they see how a designer might be expected to act in a given situation. The instructor, facing the expressed impatience of the students, shifted the focus of activity from discussion to drawing and visualizing. The instructor had the students project what they thought the horizon would look like at the year 2000, as it might appear from the school. The students, gaining confidence in use of scale and drawing skills, then developed with Mr. Beals several design projects.

THE DESIGN PROJECTS

2.2

One pair of students studied possible ways of re-using the Brockton Fair grounds. Primarily, they concerned themselves with commercial uses and advanced transportation media to get to and from the area. Mr. Beals felt that their work was less satisfactory than the other students'. They did not, as time went on, push their ideas much beyond the point where they started. They never gained confidence in working independently of instructions from the teacher.

Another pair of students developed a plan for using an undeveloped piece of land near the school as an outdoor classroom. They mapped the area, noting contours, vegetation, etc. They designated sites for biological and geographical study. The instructor was

pleased with the work of these students, primarily because of the factors with which they dealt and the capacity they eventually developed for independent work. This was accomplished in spite of the fact that neither student enjoyed working with the other. (The one student initiated the project and the other, lacking any particular interest, tagged along with the first student; the latter student stuck with the project because, after the start, he had "too much invested" to leave and start a whole separate project on his own).

An individual student, interested in waste treatment, investigated the local system. His work culminated in a model of the plant (See photo #2) which has subsequently been used as a teaching tool by Mr. Beals.

A third pair of students proposed a low elevation lake and dam system that would provide electrical power for the region (See photo #1). Mr. Beals reported that one student learned quite a lot about the technology of water power. The other student handled the graphics and presentations while working on a proposal to rehabilitate the existing Brockton CBD core.

That proposal led another pair of students to develop a counter-proposal for CBD redevelopment, relying entirely on new construction. All three students worked well on their own - they thrived on it, reported Beals - and the project, by late spring, had engaged the entire class. (Periodically during the spring there were films, lectures, or discussions which caused the work to stretch out over several

DISPLAY 3: STUDENT WORK, BROCKTON

Photo 1: Students mapped ground water and drainage basins as a part of a study for creating a hydroelectric power system in the Taunton River basin. Students relied on data gathered by regional planning, conservation, and water resources councils. Their work gave them considerable technical understanding of low elevation water storage and power generation systems.

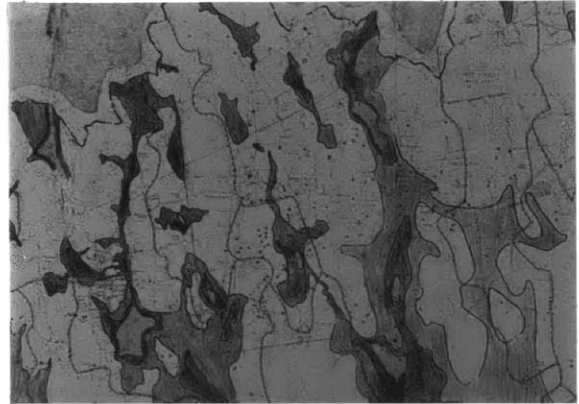


Photo 2: A student studied the town's sewage plant, then built this model. It is now used as a teaching tool.

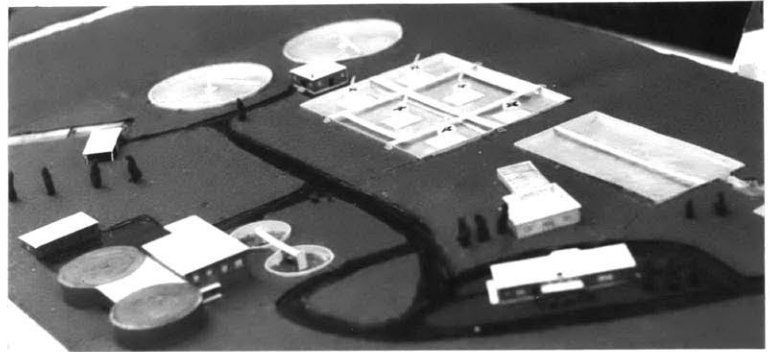
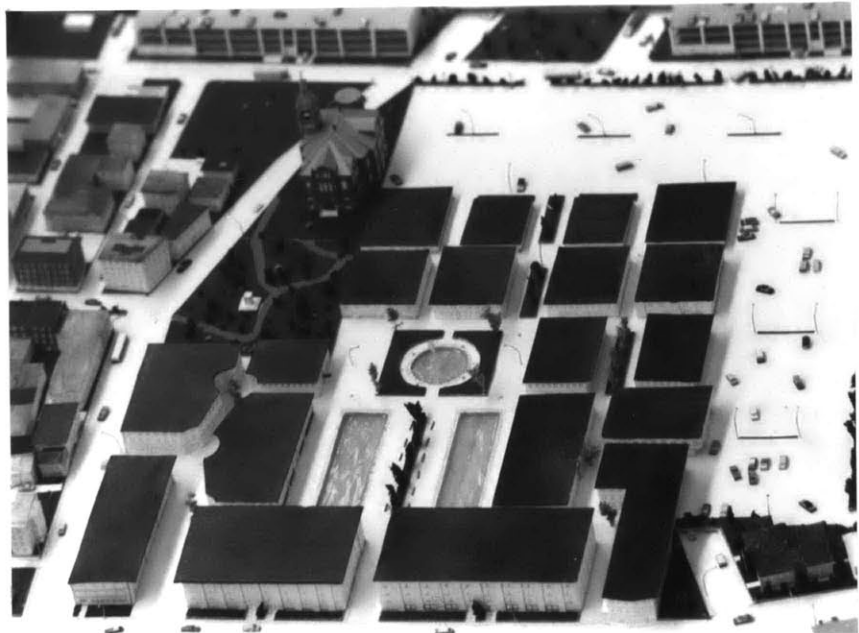


Photo 3: The entire class synthesized two different proposals for Brockton's CBD—one called for rehabilitation of existing buildings, the other, all new construction.

The model represents the joining of the proposals. Peripheral buildings to the left are rehabilitated commercial; the old city hall is rehabilitated; the new construction contains mixed public uses and commercial;

the buildings at the top are parking garages servicing a commuter rail line. Road, entering the new construction at the lower right in this photo, feeds underground parking.



months). These efforts produced a model of a synthesized rehabilitation-new construction proposal. (See photograph #3). The skilled students sided those with lesser developed abilities in visualizing, measuring, cutting and pasting.

THE STUDENTS LEARNED...

2.3

All the students who responded to the final questionnaire (N = 5) learned how to read maps and plans; they knew how to scale a drawing and could interpret topographical data; all gained understanding of how wind and temperature were related to the physical environment. The responding students were significantly more accurate in their answers than a like group of non-participating students.⁹

The course did meet the objectives of:

"raising the students' awareness of the importance of physical environment"

"students becoming aware of the interrelation between natural forces and the man-built environment"

"students feeling more confident in expressing their opinions"

"helping the students develop a systematic method for solving environmental problems"

From interviews, questionnaires, and comments the instructor made about each student, it became clear the course participants' understanding in several areas was not significantly different than that of non-participants:

"that people have different perceptions of the same

environment"

"that behavior and the environment are related"

"that the immediate physical surroundings can be a source of a great deal of information"

"that utopian thinking has its value in city planning practice"

"to familiarize the students with multi-scale modelling of the future environment"

"to teach the students that space takes on social meaning"

The students did not simply learn just what the teacher was interested in. There were guests that brought in different insights and had entirely different perspectives; there were exercises that the instructor had little familiarity with, indeed, where he was a student, too. It can be said that what the students learned was a combination of many inputs, not merely the instructor's alone. Noticeably one of his strong interests, "image modelling" (stating what one thinks the future will be) was a point where participants and non-participants did not differ significantly.

Students' journals, and the instructor's observations, indicated that the students learned a variety of things beyond the course objectives. One student--it took him all semester to become interested in what was happening in the course--reported he "learned what an architect did."¹⁰ He learned how to express himself graphically. Another student learned "everything has its own time frame...(he)

became concerned with substantive issues"¹¹. He wrote that he became aware of a

...structure, how it was built, the landscape around, it and the buildings' function, the planning that originally went into it, the immediate and long-term effect on the environment, and also my immediate reaction to the entire area...I try to relate with my own feelings of being there and come up with some sense of order and clarity. 12

He learned that it was important to hear different points of view. He thought it odd that they were "planning, preparing, designing... without a female influence."¹³ (He meant, without females as a part of their class). A student who had much background in planning prior to the course learned "a greater political sense...he learned more patience, and by helping others, became more tolerant."¹⁴ A student who was isolated at the beginning of the term learned to work effectively as a group member. Another student learned to supervise his own work. A student who had always been a loner, afraid to express himself, "dared to take a position. He learned to speak his thoughts."¹⁵ He learned that planning council staff must "compromise between two sides":¹⁶ He became very excited in this work, and decided to explore planning as a career. One student was dissatisfied through the whole course, and only criticized when he attended.

The conduct of the experience, I learned, was affected by the fact that the students were juniors and seniors. The Roxbury experience taught me that the older high school students were more serious, more interested in actually learning skills or content than were

younger (i.e., freshmen) students. The fact that the Brockton students had some prior interest in the field helped them stay with the course through its rough or boring spots. That they expressed their interest helped keep the course responsive to what they thought was important; it was, of course, important that the teacher was sensitive to, and even shared, these interests.

The Brockton students, coming as they were from lower middle class families, tended to express pragmatic values; they were concerned with how the city would get built, how much it would cost, and who would pay for it. They were particularly sensitive to political realities.

All these factors--the students' age, interest, background--had a lot to do with what they learned. Having at least as much effect on what they learned were the tools we used in forming the learning experience. Discussion of those tools and their use follows.

ANALYSIS OF COURSE DESIGN AND IMPLEMENTATION

3

Three "packages" were developed out of the curriculum design phase. A teacher's manual listed exercises, objectives, procedures, materials, sequence and duration; there was a student manual, less lengthy than the faculty piece, that suggested exercises the students could engage in and listed the objectives they were working toward. It contained "feedback" sheets, a mechanism for the students to get their comments on the course to Mr. Beals. And thirdly, there was a collection of books and materials assembled by myself and Mr. Beals. Each piece is discussed below.

Perhaps one of the biggest lessons we learned from the use of the teacher's manual was that it was not possible to "program" the events in class prior to knowing the cast of characters, their mood, and their interests; instead, the manual acted as a managerial device, to remind the process of where it ought to be going and how it might best get there (but allowing for a range of possibilities). The teaching manual was more like a roadmap than a collection of recipes. In this respect, it served well.

There are two reasons for the failure of lesson plans to work as expected. One was because of faulty design, the other due to poor classroom management. Several examples of each are presented below.

The "future Brockton" exercise was an example of a failure in design. The exercise which asked students to draw or describe their "ideal future Brockton" was keyed to the assumption that since everyone had fantasies and dreams about the future, that they would want to, and be able to, express those. The exercise might have worked if it had come after the students had developed some trust in the group or if the questions were limited to a neighborhood or a section of the town with which they were familiar. It was the case, in fact, that students had ideas of what they wanted to see, but they had a problem believing that this was important or relevant information. Additionally, their backgrounds told them that when speculating about the future, they ought to think about what will happen, since that was

more likely to occur than their wishes. As stated earlier, we learned that the students shared the belief that "there's not much you can do to control your future", "there is nothing an individual can do". Beals noted, "I gave an air of my own personal optimism about the future and apparently they didn't want to disappoint me...but they eventually did show their own pessimistic bias."

The students had difficulties in doing the assignment. They really weren't sure of what aspect or what system to portray. They needed to know "whose future? The way it ought to be, or the way it will be?" The students with no graphic experience had a great deal of difficulty representing their ideas, and possessed little understanding of scale. In a way, this represents a management failure, too; the instructor should have picked up on the discomfort the students felt and turned that into a healthy discussion--motivating the students to pick up skills or to figure out ways to talk about the future.

In retrospect, Mr. Beals thought the exercise belonged at or near the end of the course, "when they had some knowledge of the present and the past." The explanation for why dealing with the future was so difficult for the students, was, "being young, they have no roots...no basic directions...the epitome of the age of innovation...society doesn't know where it's at, neither do the kids...they have no culture in a multi-cultural framework." Additionally, it was too early in the school year, in the life of this ecology, for the students to feel safe about opening up, putting themselves on the line. The activity aimed at sensitizing people to each other, and though

this was accomplished, there are better ways the goal could have been achieved.

From this early experience, we saw a gap emerging, one that we anticipated but could not overcome. The gap was between the expectations I had in the design of the course and the motivations and level of commitment the students brought to the course. In writing the course exercises, I made particular assumptions about what motivated the students, about what they already knew, and about what they wanted to learn. The plans I composed were adequate for outlining exploration, but left the opportunity for many unanswered questions to pop up in the process of doing the exercise. Mr. Beal's constant admonishment to me was "delineate...delineate...delineate!" But in the absence of knowledge about the course participants and their mood, detailed delineation was futile. What was needed, we concluded, was a clear idea of what the objectives were, and a range of possible experiences that the instructor could engage the class in once the day's "ecology" was understood. This was just as important, I later found, in the Boston teaching experience.

I learned that failures of design could have been somewhat alleviated by a closer relationship with the faculty, learning about the students who were to take the course, the instructor's style and breadth of knowledge, and the materials and support available at the school. Much of this difficulty stems from the problem of working as a consultant, at some distance geographically and otherwise from the learning experience. (Were I to generalize to the case where a curri-

culum was being prepared for application to many schools, I would begin by getting to know the students (their values, interests, lifestyles, and aspirations) and the localities from which they come; I would try to learn about the faculty's skill and level of knowledge, and help them become familiar with the locality in which they teach. I would propose exercises and a format that reflected the special character of the schools).

A combination of both design and management failure was found in the exercises that were to lead the students to understand "modelling"--(defining elements, structure, and process of a setting) as a tool in solving environmental problems.

The instructor started the modelling exercise with a descriptive matrix he had developed; a three dimensional grid, it could be used to help describe an area. Its three dimensions were "strata", "time", and "area". Using the grid as the basis of discussion, he talked about the water environment from the micro to the regional scale. For the exercise, the students went outside the school and (realizing they had time limitations), looked at only the variable "temperature". The students thought the exercise was "meaningless, foolish...there was no relevance to what would eventually happen..." The first measurements were taken along the 107' elevation--they took the measurements at different heights, and along the sides of the buildings. The instructor noted "they still weren't into it much... but they might have been discouraged because they still had one half the school term to go..."

Here is what was supposed to happen:

The group should select several points for data inside the school and on the site; the data points should vary from place to place in only a few characteristics. There should not be too many selected, and each should have a reason for being selected ("we need a point in an open field...to see how the wind blows", "we need a light level reading in a classroom and a hall"), etc. Student teams (2 members each) will be assigned to collect specific data (i.e., a "temperature team", a "wind team"). These data teams will form in response to what data is needed as indicated by the students' model of the physical environment. Data should be collected on 3 consecutive days, then all mapped together on the 4th day. 2 days (day 21,22) should be spent studying the mutual effects of physical factors on each other. When there are sharp breaks in wind velocity, look for building mass "shadow" (wind or sun). Notice if trees cast a "shadow" and how long. See if building mass shadows are associated with footcandle differences, temperature differences, decibel differences. Note sources for sound and how the sound is distributed. Note expansion joints on the building and sidewalk. Which sections have undergone the most change? Observe indications of drainage. How does the parking lot drain when wet? Where does run-off drain to? The group may want to take core samples from under the asphalt paving to look for differences in alkalinity-salinity and moisture content. What implications do these discoveries have for reuse of land that has been asphalted for years?

That the outlined learning didn't happen was a fault of the design of the lesson. I knew why I thought the data points should be collected, and what to do with the information once it was collected; it was not communicated to the instructor how he could use this information in a discussion, or how it could, on its own, show its usefulness. Additionally, the students didn't see the relevance of data gathering. They didn't "invent" the model; it was imposed on them. The data didn't seem to fit into the practice of architecture or plan-

ning as they knew it. It wasn't until much later that the relevance of the data was shown. There really needed to be someone managing the discussion that could show how this kind of information gets (intuitively) used by architects and site planners. From this experience, the importance of knowing the skills of the instructing staff and the importance of delineating learning objectives, procedural objectives, activity guidelines, and measures of evaluating was emphasized.

The principle that students' needs should be drawn into the exercise was reinforced by this experience. In several cases, the designs for the exercises were never really tested because, for one reason or another, the management deviated from the plan. For example, the introductory session was supposed to get the students thinking about their classroom space as an "environmental problem". The purpose of using the physical environment as a learning tool was to get at some of the objectives we had outlined ("there is a lot of important information in your immediate surroundings; to discover how environment and behavior are related; to help develop a method for grappling with an environmental problem"). This use of the classroom had great potential for learning throughout the term, for this as an environmental condition, the students had to "live with"--they will always easily be able to determine if their learning laboratory is meeting their needs or not.

Of course, there are significant limitations on the use of classrooms as a learning tool, varying with the school building and the local management policies. One procedural guideline we had established was that the students should have wall space to display their materials, and

a permanent desk area where they could leave their work from day to day. The use of the walls worked out well, but the storage and work areas were never created. Advantage was never taken of the opportunity to show how space affects behavior, though it could have been demonstrated easily (students wasting time and energy looking for their books and drawings; crowded work surfaces forcing people to work on top of each other or around each other, etc.). Having students displaying their work on the walls encouraged them to talk to each other, which in part led to a feeling of "group-ness" by the end of the term (this was an objective which we had hoped to achieve). The classroom environment became a safe place for saying "what you were thinking". Curiosity was engendered, but all the other learning we could have obtained from the daily environment was lost. Here, I learned the importance of detailing contract documents and insuring that such documents have clout, and are respected by all parties. The school originally agreed to the guidelines about use of the space, but never acted on that promise.

A second example discusses the shift from the planned exercises to the "design activity"¹⁷. Students were reacting strongly to the data gathering in the modelling and measuring exercises. They wanted to get on with "real" projects.

The neighborhood mapping exercise was supposed to lead to an analysis of the neighborhoods, which I thought would naturally edge the students to want to "redesign" their neighborhoods. The idea of using the neighborhoods came from the belief that the neighborhood scale was something that the students understood, and something they could easily

handle. They could get a lot of the information they might need for an analysis just by simply looking--thus eliminating the expenditure of their (limited) class time hunting for data or making trips to offices downtown. In response to the students' pressure, the instructor decided to permit them to go right into the design activity. Without much time spent on analysis, the neighborhoods didn't immediately present a "problem" to any of the students; instead, they worked on topics that the instructor suggested to them, or that occurred to them from earlier study as posing a "problem". (See earlier discussion of the projects). The design of the course tried to anticipate the students' need to have a problem in mind (before exploration could be initiated) by having students map and discuss their neighborhoods.

There were several problems that resulted from the unplanned switch to the design activity. The students had been exposed to helping each other, stating their opinions openly, but they hadn't progressed to the point where they could do as much for each other as we had hoped; additionally, this designing really required much student/faculty contact. For those students who were self-starters, there wasn't much difficulty with finding data or making some up when there wasn't any available. For the others, designing was very slow and not terribly rewarding. They couldn't find the information they needed to get started; then, when the instructor helped them with the information, they couldn't figure out what to do with it; they floundered. Floundering is alright when it is understood as being a natural part of the learning process; here, it wasn't. The original course design tried to

anticipate these problems by choosing problems that were limited enough in scope, scale, and complexity so that the students could "chew" what they bit off; and by working with similar kinds of problems (in data gathering and problem definition) the instructor could have maximized his time and the contact between the students.

THE STUDENT WORKBOOKS 3.2

This set of documents explained objectives, exercises, and asked questions of the student. They did not accomplish the intended objectives of: 1) giving the students a sense of where they were coming from and where they were going; 2) helping them act on their own in creating or doing exercises. There wasn't the opportunity for independent work within the course until very late in the term and to expect students to do things outside of school, we learned, was strictly hopeless; 3) the goal of providing feedback to Mr. Beals on how the course was running, was satisfied by his close attention to what the students were saying and by the "daily" journal books the students kept (though they turned out to be more like "bi-weekly" log books).

It was thought that the students would develop some sense of proprietorship over the workbook and the ideas that would be included. I think the case was that since the instructor made very little reference to them or use of them, the students didn't see a need to do likewise. This wasn't the case with the journals, and in any future designs, I would integrate both journal and textbook, and use them in the course.

THE SUPPORT MATERIALS 3.3

The support materials were used spontaneously--several times reference was made to articles or books the students could read for further information, and the references were handy for that purpose. However, the subjects of the materials were broad, and the students had some difficulty in making the leap between an abstract presentation and what they were interested in relating to in Brockton.

It became clear that the instructor needed a handle on use of the material, to direct it to the special needs of the individuals in the course. It was also clear that materials focusing on the local area are more meaningful to the students than general texts. Some of the materials available:

Local

Old Colony Planning Council: Recent planning reports of the regional planning body.

Local newspaper articles on zoning, controversial development proposals, pollution, population growth, taxes, utilities, town meeting results.

City Directory--containing the names and occupations of residents, etc.

Recent work of Quest students--topographic and soil data from around the school; reports on local issues; water quality studies.

General

Bureau of the Census, Statistical Abstract of the U.S.A.

Clark, Population Growth and Land Use, Macmillan, 1970.

Downs, Urban Problems and Prospects, Markham, 1970.

East, The Geography Behind History, Norton, 1965.

Ecologue--Economic Analyses for Regional Development, Free Press, 1972.

- Eldridge, Taming Megalopolis, Doubleday 1971.
- Fein, Frederick Law Olmsted and the American Environmental Tradition, Brazillier 1972.
- Fraser, Village Planning in the Primitive World, Brazillier
- Gordon, Sick Cities, Penguin 1970.
- Intermediate Science Curricula Study, Probing the Natural World, Silver Burdett, Morristown, N.J. 1970.
- Jencks, Architecture 2000, Praeger 1971.
- Lowry, Who's Planning This Town? Harper and Row 1968.
- Lynch, Site Planning, M.I.T. Press 1970.
- McHarg, Design with Nature, Doubleday 1971.
- Metcalf, Values Education, National Council for Social Sciences 1971.
- Simmonds, Landscape Architecture, McGraw Hill 1961.

SOME OBSERVATIONS

4

We learned from the introductory session that writing contracts with the students right at the beginning, formalizing what the students and faculty expected from each other is very important. As part of this, it is important to evaluate the students right at the beginning point - learning how interested they are in the material; what skill level they have achieved prior to the course in the areas of communication, working with others, problem solving; what they know about how cities operate, components of the physical environment, and who are the principle actors in environment making; and finally, what do the students value, educationally as well as environmentally, and more broadly, about their own lives and the future. Having this information from the start would have been helpful in assessing what the students learned.

Knowledge about the students is important as a goal for the teaching process, but it is also desirable from the students' view, for assessment would provide the opportunity to learn from the experience long after it had terminated.

WHAT WAS LEARNED FROM THE STUDENT JOURNALS 4.1

The journals were very useful, even though they were used less often than we had expected. It provided a good insight into what the students were thinking, and it allowed the instructor to understand their behavior and adjust his accordingly. (He switched to the design activity in part because of what he was reading in the logs.) For some students, it was a way of being more open than they might have been in class; some students sounded like they were trying to write things to please the instructor, but most used the writing as an opportunity to vent genuine gripes. There is a responsibility to the "feedback" device that the instructor gets back to the students, if not directly, then by changing situations to correct for their reported discomfort (It is this aspect which could be improved upon. For example, to be made more useful, they (the gripes, the changes) should be perceived by the student as an important part of the educational process).

Students' complaints sometimes were not in a form that could be directly useful. For example, a student wrote that a presentation by an outside speaker was "boring"; had there been more contact with the students, following up on such comments, we could have learned what qualities in exercises most interested them.

It goes without saying that these logs were of great help to the

instructor, who knew the students in other ways and could read between the lines. As a record of what happened for an outsider, the log writings are not helpful. Some typical comments:

"I think what we are doing is very boring...I thought we were going to design a city, not take temperature readings of the ground. I mean what the hell's it got to do with designing a city?"

Another entry by a different student:

"One does not always wish to write in this diary." Sometimes, he "doesn't feel like putting the energy into concentrating my thoughts."

In another entry, the student made the observation that there were no girls in the class, or no "female influence". His remark surfaced some questions we had had since the early part of the term about operating the class without any females at all. From this we learned that at least one of the students thought our work to be contradictory, if we were planning for the future, but without representation from one half of the community. Some of these comments were useful for planning structural changes. The entries also produced an image of what the students thought of the course (all are taken from January, the last month the students made entries in their journals, very near the end of the course):

"I like working on my own design...We are all working on something that personally interests us...this forces to bring out thoughts from imagination to reality."

But he finds that such thoughts are "only a fraction of what is in him." He liked the fact that as he was trying to write, the others in the class were talking, working, and thinking. He liked "the looseness".

"I have put more time on this class than any other in my entire high school life."

"I really like the course (now - during most of the term he didn't)...there is no Evil Eye watching and pounding in a mess of information into your head."

He was a lot happier when he was doing something that he liked...

"I like the course, it lets you work on your own, speak when you want to...I hope that's the way it is in the future."

I learned from the journals that it was too much to expect students to spend every few days recording their reflections on what was happening in the course; the students were not perceiving enough change to write that frequently, nor did they see how writing activity was in their interest (though they understood it as important to the instructor). When the course became interesting, the students especially didn't want to spend their time writing, but rather "doing". That they felt open enough to respond the way they did is a testament to the respect and honest pleasure they felt toward the teaching style.

INSTRUCTOR'S OBSERVATIONS 4.2

Mr. Beals felt he didn't create lessons that communicated the difficulty in coming to consensus regarding environmental changes, or that showed the difficulties of pluralistic populations living in urban settings.

We failed to delineate systems concepts and distinguish physical and social systems (surveying structure of the landscape is very important; site analysis of actual plans; evaluation of good and bad aspects of existing and proposed projects; and all of these should be re-

lated to population size, movement, and character.

There were many questions the instructor would have liked to have seen addressed to the course, that weren't. He listed:

- What does a component mean to the various people who use it?
- What does it symbolize?
- Who made it, who created it?
- How has it changed over history?
- What has it meant to people in the past (and different cultures)?
- What level of standards does the environment represent?
- Are the standards culturally based?
- What are the reasons for differences amongst cultural groups?
- What effects has population growth had on the physical structure of the system?
- What effects has technology had on social and physical structure?
- What are the prospects for future use?
- How does future growth relate to regional, national, and global systems?
- What ecological significance is there attached to designed objects?

Mr. Beals reported he learned four major points:

- 1) There is very little emphasis in the private or public development process on "finding the proper places for uses or the proper uses for places".

- 2) That people in general don't know about planning processes and that learning this point made the students pessimistic.
- 3) There is difficulty in resolving the conflict between designing for human happiness and designing economically. Students have great problems with the conflict between "better harmonious environments" and their value on creating jobs and income. They see the need for parks, but they feel strongly that industry is needed in Brockton.
- 4) Students realized the locked-in-ness of the system, and this frustrated them. They heard from planners and realized that there is a limited amount of change those professionals can accomplish. They realize that planning moves toward some ideal state, but so much of our system is immutable (the economy, roads, city fabric, and so on) that the idealized condition may never be realized.

CONCLUDING ASSESSMENT

5

The basic conceptual organization of the course, though only partially tested, was shown to be inappropriate to the learning setting in which it was applied. The learning activity started with students confronting their immediate spacial needs, the classroom serving as the learning activity; the class was then to propose what they thought the world ought to be. The assumption was that all sorts of questions would fly out of this effort, naturally leading to what the future will be (as thought by planners, developers, and citizens). That exercise was to introduce the students to questions of the organization

and practice of environment making, the students' first concern being with what is the environment made of (modelling), then how can environment be described (measuring) and how does this information become important (mapping). Having acquired skills and understanding of the physical (natural and man-built) environment, it was thought the natural tendency of the student questions would lead to exploration of the meaning of the environment to people. The neighborhood was to be the setting for this study, allowing the students to reflect on something with which they were familiar, with easy access to data (through his eyes, ears, and feet), which would provide a basis for later work. The students were expected to assess an "entrance" that interested them - gaining insight into the relation of behavior and the environment and learning how to learn from their surroundings. The various skills and analytic exercises that had been acquired to this point were to have been applied in studies for how to redesign the students' neighborhoods. The common unit of study would allow maximization of the instructor's time, for comments on student work could be widely applicable; as well, the students would be in a position to contribute to each other's studies, being familiar with the same issues, independent activities were designed to supplement or feed into this work.

The difficulty right from the beginning was that the students' interest and curiosity was not won; indeed, the earliest experiences had the effect of confusing and disappointing them. Faulty design (example: asking students to open themselves, and project their ideas for the future) and poor management (example: engaging in data gather-

ing not tied to a felt need). Because the full set of activities were not engaged in, not all the objectives were achieved by all the students. The objectives achieved were those of skill--learning scaling, map reading, relation of natural environment and the built environment. The skills that weren't achieved concerned understanding the variety of people's perceptions of their environment, relation of behavior and the environment, learning from the immediate environment, the value of utopian thinking, familiarity with modelling as a problem solving tool.

The most significant learning -widely shared by the participants -was the development of a method for systematically solving an environmental problem, including how to supervise one's own work. Of great importance is the belief the students developed that their ideas could be important to their fellow students, the instructors, and themselves. They were surprised and pleased by the learning format, for school had never been so engaging for any of them as when they were working on their independent design projects.

The students clearly were interested in learning how the world works. Their interest in obstruse conceptual modelling and experimental proofs for theoretical principles could only come in natural order, after resolution of their first curiosities. Further work should reflect the students' need for "real world-ness".

The Brockton experience served to support several of the preliminary assumptions that guided the experience. I think the experience demonstrated that the basic belief that the "development of in-

terest, confidence and skills in studying and changing the environment"¹⁸ was within the reach of the high school students.

It was shown that a learning environment could be created that valued its participants, and that this had an important effect on the meaningfulness of the experience for participants. The students were listened to, they were encouraged to say what they felt, and as a result, they learned to be receptive to each other's ideas. The independent work, guided by the teacher, expressed confidence in the students' ability to do work which was valuable to themselves. The independent work helped the students feel valued, because they were trusted to work on their own.

Learning was measurable, or at least observable, as was assumed. Changes in behavior - level of articulateness, manipulation of concepts, application of skills and changes in attitude - all were evidenced and served to guide the process. Another basic assumption was that the study of the familiar environment would indeed be of interest to high school students; it was so demonstrated by the level of commitment that the students evidenced, especially when they had become involved with their design projects.

A principal belief, that successful exercises can be devised and employed, was modified with some qualifications. For the exercises to be successful, the teacher must have understanding of the material and confidence with it. Instructing the instructor, therefore, is important. In addition, it is valuable to work day by day with the teacher; or else be the teacher. The curriculum materials must be responsive to the changing classroom ecology.

Brockton curriculum revision and reoffering of the course was to have occurred during January and early February. Instead, the teaching staff at Brockton decided to continue with the independent work the students had started in December. No further consultation arrangements were made.

During the fall, I developed a desire to gain some classroom teaching experience myself, trying to satisfy three objectives: I wanted to 1) synthesize what I had learned from Brockton and my prior beliefs about education, 2) enter a teaching situation as a learning experience, testing my own education and abilities to relate and communicate with people, and 3) most strongly, I wanted to be a part of an environmental education experience serving those people who were most impacted by their environment with the least amount of control over it. Through the Archdiocese of Boston's Education Clearinghouse,¹ I was put in touch with several schools in the Boston area that had expressed interest in having environmental education of one sort or another brought to their students.

I was looking for a high school situation that had several characteristics; 1) a staff request that this kind of material be presented, 2) students from areas affected by stalled public or private development, 3) students who were not necessarily motivated to studying architecture or planning. I was hoping to work with students who were intelligent but turned off to school. Unstated at the time, I had hopes of using the environment as a means for getting those students interested in education.

I talked with several different schools in the Boston area, and finding one which satisfied all these conditions, settled on a high school within the jurisdiction of the Boston School Committee. The school's headmaster was very encouraging, and several of the faculty showed strong interest in the course I outlined, so necessary arrangements were finalized with the School Committee and faculty of the school. I was ready to start the course in early February.

I had prepared a thorough listing of the objectives for the course and a rough outline of the schedule of events; learning from the Brockton experience, I was more attentive to the objective writing and less concerned with specifying the exact details of lessons. It might have proven senseless to put a lot of work into calendar design when I knew that if I lasted through the course's first week, the calendar of events would change day by day anyway.

I started the experience with several intense apprehensions. First, I wanted to be sure the experience would go right - I tried very hard to do all the things I could to insure success (a presentation to the school faculty, detailed objective writing, etc.). Yet, despite all this attempt for control right from the beginning, there was a looseness, a "sliding" which I could only live with, not alter. There were delays in getting started; I was told I should wait until the spring term started; the presentation to the faculty was put off; getting the names of interested students took a week longer than planned. It looked as if the course might not start until March, cutting down on the amount of time I'd have with the students. This as-

pect of the project - learning to live with looseness or no control over simple matters - was something I only grudgingly came to accept. I should not have been so impatient, since I knew from much of my professional work that one must allow time for building acceptance in a new community. This was no less true for an all-black high school in a poor community with a teaching staff suspicious of "academics" and a school community fearful of "agitators". The situation called for a low profile; my impatience came from waiting two months to get involved while the action kept getting put off.

The second apprehension I had, and it added to the frustration of the first, was whether or not I would be able to work well with the students that finally did take the course. I really wanted to "get on with it" and find out. All I had was confidence in my ability to perform in situations that were totally new to me and a hope that I wouldn't fail to deal with the obviously challenging situation. This apprehension was reinforced by not knowing what was expected of teachers by other teachers, how the faculty related to the students, etc. My fears about "relating to students" - even surviving in the school - were cast in larger proportion when, on each of the first two days I was at the school, teachers were mugged after leaving the building.²

The initial period of growing slowly into the situation gave me the chance, or served as an impetus, for me to confront my reasons for teaching. Was I going to the school because I had pearls of wisdom to lay on the students? Was I going there to ease my "liberal" conscience? Was I going there to help the kids, or help myself? And if I was going

there "to help" them, wouldn't such paternalistic missionary work be rejected? If I was going to help myself, what did this mean for the students - was I just going to experiment at their expense? Wouldn't this fact, that I was going there to gain, too, serve to contradict or possibly block the learning for the students I purportedly hoped to reach? Why should I do it, anyway? In Brockton, I was paid well to counsel in an ongoing teaching situation well supported by an expensive, properly maintained school plant and a large federal grant. In this situation, I wasn't going to be paid, I took a risk every time I entered a community where I wasn't welcome, and the school setting was abysmal. I didn't answer all these questions satisfactorily for myself before the teaching began. In fact, I think only now in retrospect, do the answers stand clear.

WHAT WERE MY REASONS FOR TEACHING IN ROXBURY? 1.1

First, I believe that where kids are exceedingly turned off to school and lack promise or hope for what comes next in their lives, it is possible to create learning which will help the students build skills in manipulating their world (or at least to help understand it). I intended, by my actions, not to do anything "for" people so much as with them; that hopes they built and learning they did would be hopes and learning that related to their own situation, not mine.

I believe that architects and planners, and everyone involved in the business of remaking and changing our physical environment, ought to be involved in demystifying the evolution of such development. I believe that communities, be they rich or poor, ought to

have their own skills for change-making since they are, themselves, the best interpreters of what they need and want. Individuals should be on an equal footing in ability to make plans and decisions and action; I saw myself as being a conduit for the several participants in the course to learn about change, that they, themselves, may gain a handle on it.

So I didn't enter the experience with the idea that I had pearls of wisdom and the students were "cups to be filled"; I went there because I thought I could create an environment for their learning - and mine. I went there with the notion that I knew a little about the physical environment and they had many questions and a lot of opinions and could see the results of architecture and planning practice all around them (South End, Columbia Point, downtown Boston) and that together we could explore how all these things happened and were changing. I was going there to learn about what some of the problems of teaching inner city high school kids might be; the students and faculty knew I was there, not as a paid teacher, but as a student volunteering in a teaching position. This was made absolutely clear to the students and was reinforced throughout the term.

I was going there to help the kids; to help myself; and to help move the professional community, whose membership I aspire to, and the wider human community a bit closer together.

I felt that the money I received through working in a well-financed suburban high school should be used to allow me to work in an inner city setting where the resources were not so great. I ac-

cepted the responsibility of the Roxbury teaching as I would any other professional experience; once I had established commitment to a schedule, and to activities, I stuck with it; having undertaken the teaching, I contracted with myself to provide the best learning experience possible for the students. The school, as old as it was, housing as it did nearly all non-white poor from the Roxbury-Jamaica Plain-Dorchester part of Boston, offered a challenge, too. I wanted to see if the facility itself could become a part of a learning process about the physical environment. It had some unique conditions that allowed it to serve this aspect well; the administration had encouraged the students to paint murals on the interior walls, and the results were strikingly good (socially and architecturally). Further, the school's site (on top of a hill) gave it a view of the city of Boston that was used on several occasions to initiate discussion.

What was I to be rewarded with? I expected that all the effort I put into the experience would be returned to me in several ways. I thought that I would learn confidence in my ability to act in an unfamiliar, ever-changing situation; I expected that all the work I put into thinking about how the students were thinking, how to use local materials and ideas and resources, and how to help learning happen, would result in the students' learning. I wasn't there for the purpose of receiving remuneration in exchange for my presence in a classroom; my pay-off came from what went on in that classroom. As far as my obligations to M.I.T., I had to write a thesis at some point. Whether it was explicitly about the Roxbury experience or not was deliberately

kept as loose as possible. I had no axe to grind - I didn't intend the experience to prove how good or bad a particular school system was or was not; I was primarily concerned with seeing what several students and I could accomplish over the course of three months together.

For a long time, I have wanted to test myself against this immensely complicated, shifting unknown - how to be a helper in learning. I really looked forward to the high school teaching experience as one which, for me, would serve as that test, as a way of synthesizing my learning as an architect and planner and measuring and manufacturing my mettle as a person. At the heart of it, all these reasons compelled me to engage in the experience.

COURSE OBJECTIVES 1.2

Building on the Brockton experience and documentation of other educational experiences, I brought together objectives that seemed important to design the course toward. They fell into five categories: analysis, synthesis, communication, content, and objectives for the process. Students would...

Analysis

- ...learn the ability to gather information and make judgments;
- ...understand the phases in problem solving;
- ...understand the usefulness of conceptual modelling (describing the structure, components, and process of any system);
- ...learn the ability to read and scale maps;
- ...gain the ability to analyze the politics of an environmental controversy;

...be able to read the quality of environmental settings.

Synthesis

- ...learn the ability to formulate projections of a desirable environment;
- ...learn facility in using examples to help them solve problems;
- ...learn how to contrive learning.

Communication

- ...learn the ability to communicate verbally and visually to others.

Content

- ...become familiar with the components of the physical environment;
- ...understand the mutual effects between systems of movement, open spaces, and built environment;
- ...understand the institutions involved in environmental development;
- ...understand the plurality of perception;
- ...learn that the planning process is not generally known by the public;
- ...learn that planning is affected by businessmen and landowners;
- ...learn that space takes on social meaning;
- ...learn that designers must consider the whole environment when designing;
- ...learn to identify resources in the community;
- ...learn to value speculation;

...learn cues for seeing how the immediate surroundings are a source of a great deal of important information.

Process

...learn to be at ease with each other, and with me;
...learn to value students' contributions;
...learn to motivate the students' interest in their environment;
...learn to motivate students to want to learn more;
...learn how to work with each other;
...learn how to work independently and critically;
...learn how local conditions can provide a great deal of information.

These objectives all aimed to produce students who had the confidence and ability to change their environment. This was tested by questioning students' awareness of strategies available to solve familiar problems. As a long range goal, its achievement can really only be checked after some time. When the students asked "why this learning was important", I told them that just as when they bought shoes, they checked the size, color, and style to make sure they were right, so they could know how to check their environment to see if it fit them properly. They were to become articulate consumers of the environment.

THE EXERCISES 1.3

The objectives were to be achieved through a series of exercises, which, as in Brockton, were written for a different kind of high school

student than actually took the course. The students of the idealized class, for which I wrote the outline, routinely came to class, sat in one place fairly regularly, became interested in the course after a few weeks, and by the end of the term were working independently on topics or projects of interest to them. By distributing and discussing this outline (see following pages) with faculty at the school, I expected to obtain advice as to what would or wouldn't work, what attitudes I'd find in the classrooms, etc. Since there were no responses, I assumed that the outline represented an acceptable way to proceed. (It's possible that someone might have wanted to speak with me, but couldn't have--not knowing my schedule or how to reach me.).

I expected to spend the first day getting to know the students' backgrounds, explaining the learning objectives of the course, and talking about what was expected of the students. The opening exercise, like Brockton, was to have the students write or draw what they thought Roxbury ought to be like in 25 years. I expected students would express difficulty with this; that they would want to know first, what it "will" be like. Therefore, "will" was to be the next exercise. I thought that dealing with the future "realistically" would cause the students frustration ("nothing can be done"), so we would shift our attention to what Roxbury is, something they all knew about. This exercise was to have the students look at components of the urban environment, learn how the various parts inter-relate, and begin to establish the need for more specific information and ways of handling the data. The same problem that the Brockton course faced was shared in this case; if I were to redo

the experience, I would start with what is.

Some exercises were expected to be accomplished after school. Students were to either develop a catalogue of learning resources in the Roxbury community or catalogue environmental fits and misfits through drawings, photos, newsclips or whatever. Having introduced these exercises in class, we were to move on to modelling (describing the components and process of a system). The objective was to develop the students' ability to think systematically, helping them analyze the problems they saw around them. The organization of the observations they brought to class and the class discussions would lead to an analysis by each student of his or her own neighborhood. They would observe the qualities of environments, the kinds of uses, and the patterns of behavior. They were to pose questions to relevant city agencies.

Over the mid-term break I had hoped the students would be working on the "misfits" catalogue, learning resources, and other independent work. After the vacation we would use this information in the "design your neighborhood" exercise. The post-vacation period was to begin with everyone observing an entrance (to a school, store, etc.), giving the students insight into the relation between environment and behavior. Then we were to participate in a game, simulating the development of a part of Roxbury. Finally, students would apply all they had learned in proposing a re-design scheme for a particular problem in their neighborhood.

DISPLAY 5: ROXBURY CALENDAR OF ACTIVITIES

Planned Events

Actual Events

Introduction; learn about march
students background, expect-
ations. Reasons for the cause.
What is expected of students.

What Should Roxbury Be? Write or draw ideal
Roxbury. Surface values, goals.
Raise issues for further explora-
tion.

What Will Roxbury Be? Describe (and understand) ele-
ments of the urban environ-
ment. Discuss what future will
be, in light of previous exercise.

What Is Roxbury? Neighborhood mapping, looking at
human needs and how they
are satisfied. Components
and their relation.

Yellow Pages of Learning Resources/Environmental
Misfits Catalogue; stu-
dents to catalogue misfits
and resources in the com-
munity.

Neighborhood Analysis; Observe qualities of environ-
ment, relate to user behavior.
Elementary understanding of
environmental change insti-
tutions

march 5 Introduction; distributed
questionnaires (pre-test). Confused
about who would stay with
course. Students' interests not
apparent.

march 7, 8, 11 What Should Roxbury
Be? students didn't write bio-
ographies. Little idea of their in-
terests. Class just settling down.
No one did drawings, just oral
descriptions of "what Roxbury
should be".

march 11 What Will Roxbury Be?
Discussion filtered in with pre-
vious exercise. Difficult to
separate topics.

march 11, 14, 15 Situations In Need of A
Change; Students listed
problem areas; housing,
schools, high rise develop-
ment, parks. Unsuccessful at
trying to have students think
about resources for solution.

march 21 Neighborhood Analysis;
22 Discussion about neigh-
25 borhoods while students
draw maps of same. Sug-
gested they observe en-
trances.

march 28 View The City; No one
did the 'entrances' exercise.
We went to the top floor of
the school, looking at the sky-
line. talked about institutions.
form of city. airplanes. houses.

Display 5: Continued

- march 29. Field Trip Preparation; Described the Boston Redevelopment Authority and the Public Facilities Department; tried to have students write their questions.
- april 1 Had very good discussion on why I thought this material was important; what they thought was important.
- april 2 City Hall: The Public Facilities Dept., The Boston Redevelopment Auth. and Lunch; The students were to gain exposure to operating on unfamiliar turf; learn what the city agencies do; and build trust in the group. Goals satisfied.
- april 4 Evaluating The Trip; No one came to school this day; anniversary of Martin Luther King's death.
Discussed field trip; students
- april 5 uninterested in recapitulation. Mid Course Evaluation; Questionnaire revealed that most students had many other more important activities than this class. Students reported they were learning "stuff they ought to know".
- april 8 Field Trip Preparation; Tried to have students think of projects that interested them. Acquainted them with Roxbury Action Program.
- april 11 Excellent presentation by this non-profit black development corporation; explained development, housing management issues.

Vacation: Yellow Pages
Research into community problems

april 15-19

Vacation

Display 5: Continued

Design Your Neighborhood; april 22
Discuss issues relevant to neighborhood analysis; understand the plurality of perceptions and needs, test solutions. Understand institutions involved in urban change.

Entrances; Students to april 25
observe an entry to a building 26
- learn to read environments, 29
understand relation of environment and human needs.

Simulation: Students may 2
were to learn about key actors in urban change by playing an urban development game.

Redesign Your Neighborhood; may 6
Based on previous work in the course, students were to recompose their earlier designs.

april 22 **Evaluate The Field Trip, Assess The Course**; it was terribly hard for everyone (including me) to be excited about anything: post vacation slump. A random student strolled in and talked about RAP.

april 25 **Problem Solving**; Tried hard to introduce principles of problem solving. Talked about visiting MIT as a "community problem". Extraordinary discussion on housing management.

april 26 **Recapitulate**; I tried to summarize what was said about problem solving and housing management. Very dull, no one paid attention.

april 29 **Photographing The City**: We used a 35mm camera to photograph parts of Roxbury and Dorchester the students thought were important; what is the city, how is it used.
Visit MIT; We walked around the campus, visited architecture studios. Students became tired fast.

may 2 **Map Your Neighborhood**; The activity had as its aim presentation of 'issues' to MIT people in one week. few students attended this day. Impromptu student evaluation of teacher: they said "get tough!"

may 6 **The Development Process**; Reacting to students suggestions, I gave a structured lecture. Students listened, but barely.

may 9 **Presentation at MIT**; Invited MIT people were late; students impatient. We "redesigned"

Display 5: Concluded

- Dudley Station - which provided some good learning.
- may 10 **Housing; How It's Used:** few students attended - one brought a drawing and we talked about perspective.
- may 13 **Housing: How It's Used:** I drew a map of the neighborhood where I grew up. Others drew maps; discussion became heated about what needs communities have, how residents can solve problems.
- may 16 **Field Trip Preparation**
Acquainted students with Housing Innovations, Inc. Invited students to my house for a party - that's all they wanted to talk about.
- may 17 **Structure; Plumbing; Electricity** in the home. I used simple illustrations. Students not too interested.
- may 18 **The Party**
- may 20 **Field Trip: Housing Innovations Inc:** Chief of housing management explained tenant selection, development process, management issues. Excellent session.
- may 23 **State House: Housing:** took a tour of legislature. Legislator we were supposed to meet didn't show up. Total flop.
- may 24 **Evaluation** Pretested several questions to ask in a final interview.
- may 29 **Slides** Students asked to see work I did. Prison work interested them the most.
- June 3 closing interview with each student
6
7
10
13
14

THE EVENTS: GETTING STARTED 2.1

The students were selected with the advice of several teachers and the principal of the school from a list of about 120 students suggested by the faculty of the high school. The faculty were asked to submit names of students who a) might be interested in the content of the course, or b) were bright but lacked interest in school. Fifteen of these students were asked to attend an introductory meeting to explain the course and to determine if they were interested. Of these fifteen, there were five people who regularly attended class; and another two or three who attended erratically. Two students, at their request, were added during the term. (It is conceivable that if we had openly advertised the course, many more students would have elected it; I was principally concerned with having a mix of students working as a small group.) The average daily attendance was about six. The most that ever attended was ten, and the least, one.

The course was set to meet on Mondays, Thursdays and Fridays. It was felt that meeting five days a week would be too much contact - the classes would become too boring and too predictable. Though meeting three days a week cut into the available contact time, it was thought that the format would give the students time to do work that arose from the class, or keep up with their outside work.

The most frequently mentioned reason why the other ten students first invited didn't stick with the course was that its projected meeting time conflicted with important classes. To partially resolve this problem for those that did stick with the course, the meeting time was

rotate from day to day. This schedule hurt the class for a long time because the students couldn't seem to remember what time the class met on a particular day. So each day I had to make an announcement of the meeting time and place.

Initially, I felt there were two absolutely essential conditions for the conduct of the experience. First, there had to be course credit for the students involved, and secondly, there had to be a regular meeting space where the students could expect we'd meet and where they could keep their work. I assumed that the class would meet at a regular time. My understanding when I first committed myself to work at the school was that all these conditions could be met. The only condition that was met was that the students who stuck with the course received two units of credit for their work (though initially, the agreement was for three credits).

THE STUDENTS WHO ENROLLED

2.2

There were two males who regularly attended class, and a third who came for about half the term. There were five females who all attended fairly regularly. Three of the girls were in their first year of high school; the others were sophomores or juniors. Three of the women students each had a child living at home with them. Five of the students lived in public or subsidized housing, one student lived in private rental housing and two students lived in homes owned by their parents. Of the eight, five lived in Roxbury and three in Dorchester; they all came from widely scattered parts of those neighborhoods.

Only one of the students had a prior interest in anything "environmental" - he was an accomplished artist. Another student was taking the class only because she was the girlfriend of the artist, and they did everything together. Two sets of students knew each other before the class; the couple, and the freshmen girls (who joined the class at various times during the term).

THE EVENTS 2,3

After many delays, I presented an outline of the proposed course to the school's faculty. Several faculty expressed interest in working with the development and teaching of the course.

After several more weeks, fifteen students (selected with the aid of the principal and several faculty) were asked to attend an introductory session. At the first class meeting, I explained how I thought the students' needs and my experiences fit. I asked them to prepare a biography and to respond to a questionnaire, both of which would give me some information about their knowledge and values.⁴ Their lack of enthusiasm on the first day was a blanket to my own. By the end of the first week, we had some conversations about what the schools and houses of Roxbury would be like in twenty years. Not everyone came all the time, so the same ground was re-covered several times. Fitfully, amidst many distractions, we talked out issues that the students thought to be important (housing for low-income, no new high rises, clean streets, etc.). By the end of the second week, I didn't refer to the schedule of exercises except to remind myself of objectives to meet, methods of conducting the class, and so on. A pattern

of experiences began to emerge that reflected my perception of the students' interest. (See Display 5).

I asked the students to draw maps of their neighborhoods. After several classes, and much imploring, one of the students brought in a map. Seeing the drawing, and discussing it, everyone became excited. Much learning was accomplished through this exchange. I learned that students responded well to activities in which they were doing something. Picking up on this realization, on the following class session we went to the top floor of the building and observed the Boston skyline. The view stimulated the students to ask many questions (Who owns that building? What does a building inspector do? Who pays for fixing buildings? What parts of Boston can we identify? Why had the windows fallen out of the John Hancock building? How do jets stay up in the air? Why can't cars be propelled that way?).

Hoping to continue the momentum the next day, I tried to have the students list questions they would want to ask of the Public Facilities Department and the Boston Redevelopment Authority; we had field trips planned to each of these agencies on the next class meeting. The questions they asked were not about city planning or architectural issues, but about who they would talk with, and what they should wear. They seemed more concerned about what white adults thought of them than what could be learned from those people. In class we looked at a site plan for the proposed Campus High School Urban Renewal Project, and that helped the students think of specific questions.

The visit to Public Facilities proved to be a good learning

session. The students continuously asked lots of very good questions, even though the staff couldn't answer many of them at all. By the time we visited the BRA (the same day), the students were fatigued, and subsequently, that contact wasn't as successful. Back at the high school, we took several days (due to sporadic attendance) to review what was learned and answer questions raised by visits to the two agencies.

I had planned another visit--this, to a local, non-profit, all-black development group (Roxbury Action Program)⁵--thinking that much could be learned by contrasting the two approaches--(governmental and local private)--to urban redevelopment. Before this next trip, I asked the students to respond to questionnaires about the course's progress, their level of interest and so on. The feedback proved very helpful--from the data I learned that most of the students considered this course less important than their other courses and jobs. I learned that the reason the students didn't do outside work for this class was that most students had jobs after school, or had so much work from other courses that they couldn't find the time. All respondents reported they were learning useful things in the course. I had hoped to use these days to discuss how we could make the course and the field trips better, and prepare questions for the visit to the Roxbury Action Program. This was the kind of activity that didn't interest the students.

The associate director for RAP explained the history of Roxbury, talked about RAP's philosophy of self-determinancy for the black community and how RAP was accomplishing this goal. The students had several

questions about the management of housing, tenant selection, and community needs. The discussion was the best we had to this point in the course, dealing as it did with assumptions, beliefs, hopes, reality, and remaking the whole system.

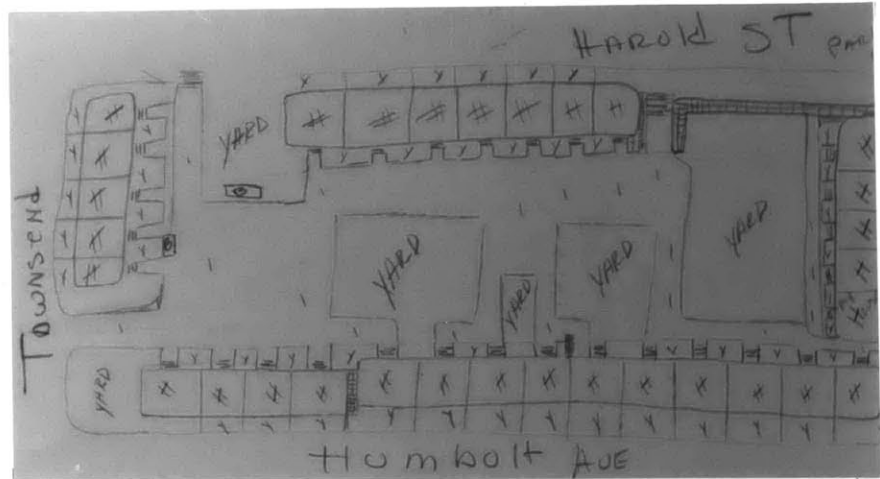
Because of the spring break, we didn't meet for a week; when we got back together, it was a surprise to me to discover how lethargic the students were. It took most of that week to re-establish momentum. During the conversations, I tried to introduce some ideas about problem solving, by having the students confront a problem; I planned a trip to M.I.T., where, I hoped, the students would present questions and thoughts to some of the people there. This was "the problem". We got only so far as to decide to take slides of Roxbury and Dorchester. Our talks were fruitful, though, in that they led to disagreement amongst the students whether or not harmony and tenant cooperation were possible, and how this could be achieved. The students debated the problem of maintaining housing, and what policies were best (For example, paid maintenance men living in each building is desirable, it was decided). As fine a discussion as this was, intense and involving everyone, the momentum did not carry over into the next class. Lacking any interest in continuing the previous day's argument about housing, I explained the use of my camera⁶ and the students took some photos of Roxbury. The next day was our scheduled visit to M.I.T.; beforehand, we drove around Roxbury and Dorchester, photographing what the students thought were representative shots of their community.

When we arrived at M.I.T., we walked around for a while. Then

DISPLAY 6: STUDENT WORK, ROXBURY

Photo 1: Students were asked to map their neighborhoods, in an effort to show how they are unique and important to residents. This student's map lead us into discussions about how backyards are used; and what neighborhood people do in the public spaces.

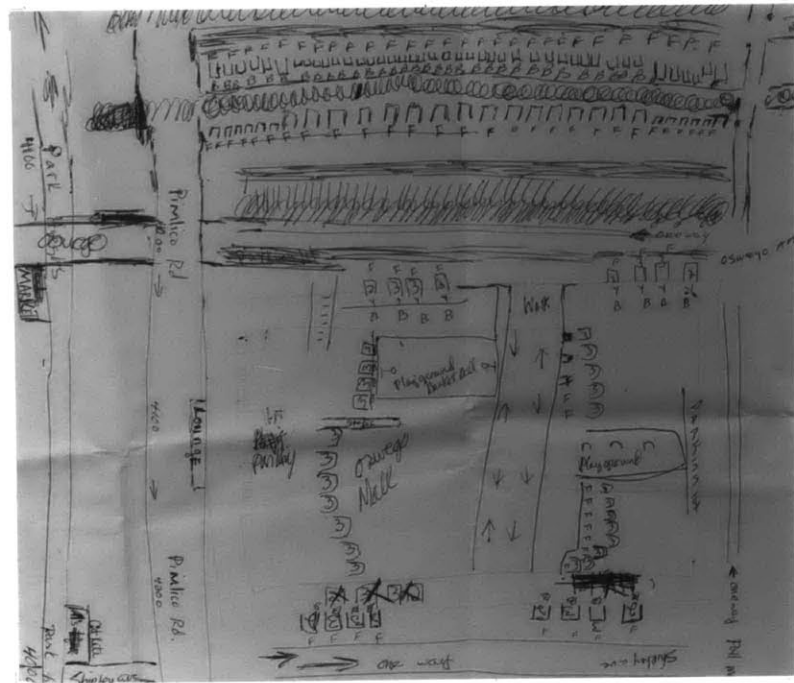
This map also lead us to distinguish between the Federally subsidized housing program ("236") and public housing. This is an interest-subsidy project, and the subsequent discussion was enlightening for the students.



1

Photo 2: The student who draw this map didn't know much about Boston, so he draw the neighborhood in Baltimore where he grow up.

This drawing led to discussion about the differences (and relative merits) of yard spaces in the Boston three-decker and the Baltimore row house.



2

we talked with some of my classmates in planning and architecture. The high school students saw a little bit of how architects work and how education runs at M.I.T. Another trip to M.I.T. was planned, this one a more formal meeting between the high school students and selected M.I.T. faculty and students - I thought the interchange would be valuable for both. Attendance was erratic during the week prior to that trip, making it hard to carry on any discussion about questions the students might have. Students primarily wanted to "rap" with me about the course, and told me they wanted more structure. I tried to organize a straight-forward presentation, replete with handouts, on aspects of plumbing, electricity and structure in housing. The students were just as uninvolved as when I relied on their questions to structure a lesson (the kind of structure they had said was "too loose"). On the day we were to meet formally with the M.I.T. people, only one of the expected guests showed up at the appointed time. Rapidly, the students grew impatient. I revised the planned activity, so that instead of talking, the students were asked to redesign part of the Dudley Station. Each of three little groups went through questioning themselves about what existed and what to do with it. The M.I.T. faculty participated as team leaders. The session was pretty intense for most of the students, and after about forty minutes they became fatigued.

Over the next few days (early in May) "activities" I had planned were displaced or just didn't happen because of spotty attendance. The one day we did have good attendance and an excellent learning session, I began the class by drawing a map of the neighborhood where I grew up.

Others began asking questions, and then drawing their own maps. Most of the discussion focused on community needs, with Columbia Point Housing as an example of a neighborhood needing more service. Another day, we spent outlining what we might expect on our visit to the site office of Housing Innovations, Inc., a minority-owned housing development group in Roxbury-Dorchester. The visit, which took place late in May, made one of the best classes we had all year. The head of the management division showed us through apartments, and concisely answered every question the students put to her about her job, housing costs, where rent money goes, rental policies, attitudes toward welfare people, and on and on. A week later, to follow up on the focus we seemed to have developed around housing issues, we visited the State House, to meet with one of the District Legislators (who happened to be a housing expert). Unfortunately, she never showed up, the tour we had was a bore, and the whole trip disappointed everyone.

The students expressed interest in seeing slides of some of my work, so I brought in a trayful--mostly of places I'd visited, and sections of Boston. The slides did encourage some good discussion about living in a small town vs. a city, high-rise living vs. low-rise living, and how most big cities seemed to have the same problems, and so on. What interested them most was the work I did in Raleigh with prisoners. With personal interviews with each student ("the final exam") into mid-June, the course slid to an end.

Assessment of what the students learned was based on an interview and questionnaire at the end of the term. There were no written materials, nor enough graphic materials to use in evaluating student growth. (See preceding page). Seven students were interviewed.

Six of the seven students learned what a mortgage was; four learned where and how they could get one. Six of seven could identify characteristics that landlords look for in tenants; five of seven learned what rent money typically pays for (mortgage, maintenance, taxes, profit); all the students learned where they would go to get part of their house fixed; five of seven could cite a strategy for how they would get a street repaired; six of seven could cite reasons for the location of the firehouse in Dudley Station; six of seven could describe likely perceptions of a variety of users of Dudley Station; four of seven could generate detailed questions of an urban renewal proposal; four of six were able to identify five components common to all buildings; six of seven became concerned about an issue in their community. Other tested points, not learned with as much success; only two of seven respondents knew what zoning does, or could define what a developer does; only two students could properly identify the agency that makes the plans for Boston, and only three could identify the agency building, Campus High School (an urban renewal project); only two students could identify the various laws of importance to that project (contract law, urban renewal law, zoning, building, fire and health codes); only three of seven students could accurately read a plan, describe its proposed uses, and

DISPLAY 7: EVALUATION OF STUDENTS' LEARNING, ROXBURY

Questions	adequate response		N	Objectives
	adequate response	inadequate response		
What is a mortgage?	6 85%	1 15%	7	Understanding urban institutions & change
Where can you get a mortgage? How?	4 57%	3 43%	7	Understanding urban institutions & change
What characteristics do landlords look for in tenants?	6 85%	1 15%	7	understanding urban institutions; problem solving.
What does rent pay for (typically)?	5 72%	2 28%	7	understanding urban institutions.
Where can you go for help or advice in fixing your house?	7 100%	0	7	community resources; problem solving; understanding institutions.
Say you wanted a street fixed in your neighborhood; what would you do?	5 72%	2 22%	7	problem solving; community resources.
Give reasons why the new fire house in Dudley Station was located there	6 85%	1 15%	7	understanding urban politics; understanding components of the urban environment.
What do you think wins think of Dudley Station?	6 85%	1 15%	7	understand the plurality of perceptions in the urban environment
What are questions you would ask if you were a resident of this (Campus High) urban renewal area?	4 57%	3 43%	7	read maps; read qualities of environment; able to project desirable qualities of environment; understand relation betw. behav. + environment.
Name at least five components common to any building	4 66%	2 33%	6	understand components of the physical environment.
Have you become of any issues in your neighborhood (over the past few months)	affirmative 6 85%	negative 1 15%		students should become "articulate consumers" of their environment.
	2 28%	5 72%	7	understanding urban institutions
What is zoning?	2 28%	5 72%	7	understanding urban institutions
What does a developer do?	2 28%	5 72%	7	understanding urban institutions

Display 7: Concluded

	adequate response	inadequate response	N	
What agencies plans for the City of Boston?	2 28%	5 72%	7	understanding urban institutions; identify resources; planning process
What agency is building the Campus High School?	3 43%	4 57%	7	understanding urban institutions; identify community resources
What laws are involved in the building of the Campus High project?	2 28%	5 72%	7	understanding institutions and change
Describe what you think life will be like here (refer to LRCC housing)	3 43%	4 57%	7	read plans; read env. quality; project desirable environment
Describe the scale of the plan; wind, sun, and drainage effects	1 15%	6 85%	7	scale; relation between natural and man built environments
Give examples of how different cultures create space differently. Explain why the forms are that way.	2 28%	5 72%	7	understand the plurality of needs and perceptions.

speculate on how people might use it, what they might think of it; only one student could describe the scale of the plan accurately, and describe wind shadow and drainage effects; only two students could cite examples of how different cultures use space differently. (See following pages).

In terms of the course objectives, all or most (4 or more) of the students gained in these areas:

- Ability to read qualities of environmental settings.
- Learn to identify resources in the community.
- Understand the plurality of perceptions in the environment.
- Learn to understand (but not scale) maps and plans.
- Help students feel comfortable with me, accept me as fellow learner and someone who can help them in their learning.

Only some (3 or more) students gained moderately in these areas:

- Ability to communicate verbally and visually.
- Introduce students to the usefulness of conceptual modelling.
- Get students excited about learning, interested in school, curious about each other.
- Learn that the immediate surroundings can be a source of a great deal of important information.

Students didn't gain at all in these areas:

- Learn to scale maps.
- Facility in using examples and analogies in problem solving.
- Learn to work with others in a supportive way, learning to work independently and critically.

- Gain an understanding of each of the phases in a problem solving process.
- Acquire an ability to gather information and make judgments about the adequacy of its level and nature.
- Learn to continue learning after the class has ended.
- Learn that designers must consider the total environment when designing.
- Understand the value of thinking systematically, and abstractly, about a problem.

STUDENT EVALUATION OF THE COURSE

4.0

Three of six students responded to the final questionnaire. (See following page). They were asked if there were enough field trips; the sense of the responses were that "for the period of time we had the class, there were enough". Students were asked if they liked the idea of working on a project like redesigning their neighborhood, or having lots of discussions and field trips; the responses split, one for discussion, one for project, and one for doing each. The students were asked "what they learned from the other students"; one student said, "(the three male students) were interested and I think they asked good questions". But another student wrote, "All I learned is how stupid some people are". Another response: "...nothing from the students, we learned from the teacher." All students felt the number of students in the class (seven) was ideal. On the question of having required homework, one answered it would make the course better, another said worse, the third didn't know. The students thought more handouts would

Should there have been more field trips?

yes		no		other	4
-		3		-	3

Which is better: working on a project (like redesigning your neighborhood) or having discussions + trips?

project		discussions		both	4
1		1		1	3

Did you learn from the other students in the class?

yes		no			4
1		2		-	3

What is the ideal number of students for this class?

more		less		same (7)	4
-		-		3	3

Would the course be better or worse if homework were required?

better		worse		didn't matter	4
1		1		1	3

Rate the teacher, compared with others you've had (one = very good, seven = very bad)

1	2	3	4	5	6	7		4
3								3

How did this course compare with other courses you've had in school? (one = this was successful, seven = this was very poor).

1	2	3	4	5	6	7		4
3								

DISPLAY 8: STUDENT EVALUATION OF THE COURSE, "INTRODUCTION TO THE URBAN ENVIRONMENT"

have been helpful, as opposed to a textbook. The students were asked to rate the teacher, "compared to others you've had". Where "one" rated "very good", and seven "very bad" - all cited "one". The students, in noting the teacher's good and bad points, said: "don't be too soft", "good point: he did what we all like; bad point: quick temper". When asked to compare this experience to other courses they've had, two cited "one" (very successful), and one "two" (on a scale of one to seven). The reasons they gave for why it was a good course: "it was open", "I learned what I should have learned before now", "it taught me things I didn't know". In written comments a student said, "I think it should be taught again...I didn't like the three (freshmen) girls...Sometimes I didn't want to come because of them...I think it was all very interesting".

ANALYSIS OF COURSE DESIGN AND IMPLEMENTATION: THE COURSE DESIGN AND
THE TEACHING MANUAL 5.1

Quickly I learned what was valuable from the course design: not the calendar of activities, for we parted from that early. But the objectives, and the description of possible activities, served as guides and goads in the evolution of the classroom ecology. The teaching manual served at once as a diary for past events and a stimulus for future ones.

In Roxbury it was too hard to separate out the failures of design and the failures of management. The design or basic conceptual organization proved inappropriate, and not merely due to its implementation, as I thought was the case in Brockton. A lead activity is needed that will really grab the students' interest, something like walking

through the community or observing the community from a high point. The design of that first activity must recognize that a group hasn't developed and it has a long way to go before it does. The deep and open thinking that one would like to see won't happen until the classroom ecology is made safe for that kind of exchange - and it takes a certain amount of time and shared activity to arrive there.

As for the day-to-day management of the classroom, I felt that a good part of its sluggishness was due to forces over which I had no control (See discussion following, on Developing a Style).

But whatever the limitations of the course were, its strengths came, in part, from an understanding of the community's resources. The best class sessions came as a result of direct contact with representatives of some of the key actors in the development process. Most of the course preparation went into learning about what was happening in the community, who and what would make stimulating contributions to the course. What were some of these resources?

THE PROBLEMS OF DEVELOPING A STYLE 5.2

I entered this high school, and teaching, without knowing what to expect. I didn't know the students, their abilities, how the school worked, or the students' attitudes toward it. The first meeting was sloppy; the door on the classroom was locked, the meeting time created a conflict for many students, and the students just sat mutely - feeling me out, as I did them. Most didn't know each other, and all weren't sure why they were there. Their lack of enthusiasm was a way of testing me. They waited for me to perform, to go after them.

I learned that those first few days are important for building the educational "ecology", establishing roles and identities. Students enter a new course with a new teacher with no model for how to behave; one must be invented. I was to learn that one of the more difficult problems is not thinking about what is important to learn, but how to assess the students' needs and interests and design strategies for learning. It took me several weeks to realize that my notions of student interests, motivations, and needs were very different from the real conditions.

Much of my mis-judgment was due to being a first-time teacher; working more closely with the faculty of the school in course development would have helped me learn more quickly how to master the difficulties of the teaching experience. In any case, what finally emerged as the "course" was a complex fabric affected by my unlearning of preconceptions, development of communication between myself and the students, adjustment to the ambiance of the setting, and use of my frustrations and a priori objectives as stimuli to action.

I had several notions (i.e., students attend class regularly; arrive on time; become interested and do work both inside and outside class), upon which I based my expectations about performance. My first problem was learning about the students, and unlearning my preconceptions; this took much time. I relied on their written and graphic work to help me learn, but it wasn't forthcoming. It took until mid-term before I learned the reasons for the lack of student output. It took a long time to accept the students' participation, such as it was,

rather than expect a standard level of involvement. None of the students realized until the end that they were earning credit for participation in the class; it was clear throughout that the logistical confusions severely constrained the effort to develop a valuable learning experience - the style of the course was constrained and molded by the problems of a lack of consistent meeting time, or place, and a perceived lack of official sanction.

Building communication between myself and the students, I had to develop roles for myself and the students. Was it "teaching", or "leading", or "partners-in-learning", that was to inform my relation to the students? My "style" evolved as the ecology emerged. I wanted, at first, for the students to "learn" certain things ("how to change their environment"). Their behavior was the very example of why I thought the material was important; the three freshmen girls were failing school. Being black and being women, they would be faced with many problems in their lives; I had hoped they would learn a little about their world so they wouldn't be quite so caught in the inevitability of their dilemma. And there was the tension between the older and the younger students; the older were more serious, more interested in the course. Had I a class full of them, the learning would not have been so fitful.

But what about the "style" that developed? I went into the classroom to learn some things - how to listen; what "non-academics" were thinking about their world; what was Roxbury as a place to be. So the students were teaching me, in some ways. In other ways, I wanted to

encourage them to ask questions and to answer their queries if I could. And I wanted to (and did) arrange activities that would stimulate their questions. I wanted to see the students as people, and did, hearing them talk to me about their struggles of being young, and growing up; of being black; of being treated unjustly; of having fun with dope and music and their friends. They saw me get angry sometimes, at not being able to engage the attention of the students; they saw me confused and unsure of myself when dealing with the students who didn't stick with the course; they saw me at M.I.T., with my teachers and fellow students; and they saw me at home with my music and my friends. They saw me excited at times when we learned together. I think I was a bit of a teacher, a friend, and a student. I was as human to them as they were to me.

ADJUSTING TO THE SETTING

6

While the course would have changed somewhat if it were more central to the interests of the students, several recurring difficulties hammered at how I developed as a teacher, and how the learning ecology developed. One such difficulty was the lack of a regular place to meet; the students neither had a secure place to store things nor a consistent place to work or even tack-board space for display. In the beginning, the lack of time and place kept attendance tardy or erratic.

Another major difficulty was the distractions, of several sorts. The worst problem was created by the drifters, students who left their assigned classrooms and who floated in and out of our classroom. I

rarely chased them out of the class, more frequently ignored them, and sometimes encouraged them to participate if they sat down with us. Some of these contacts were quite fruitful, but for the most part, the drifters just played cards or talked loud or tried to talk to the students in my group. I usually didn't chase them out, just asked them to be quiet; the ten minutes or so it would take to uproot them was valuable time lost and momentum interrupted. (Whenever possible, I tried to have my group meet in the cafeteria where we were alone. The problems with meeting there, however, were that the tables were unclean, benches were uncomfortable for sitting, and there were no chalkboards).

Another kind of distraction came from other teachers. Several times, members of the faculty chased around our room after students, entirely disrupting my group, or came into the room to ask me if they could "see" a certain student (and wouldn't relent until the student left the group).

While much of the beginning time was spent building the delicate ecology that allowed for most interactions to occur freely, the students never stopped testing the teacher, even if ever so gently. In the beginning, the students hadn't an interest in the course at all; they sat stone-faced, waiting for me to perform and bully them into some "learning". Later, they tested me by talking to each other back and forth while I would try to explain one or another things. But by the end, we had built a bond which allowed each of us to give vent to our feelings when they were close enough to the surface. By the middle of the term, I learned not to "chase" them; I relaxed, and tried to let them

know that it was their questions that I thought important. Sometimes, there were pauses we suffered through. At times, I became angry at the freshman girls for acting rudely; and they weren't hung up about telling me when they were bored.

Learning what worked well meant first absorbing and understanding a great amount of frustration. First, there was the problem of motivation; most of the students who stayed with the course, at first had no interest in "the environment". I was put in the position of either trying to discipline these students into attention or to gain their interest. I tried the latter path. When I grew angry with them for not paying attention, not being involved, they asked: "Why is this stuff important to me?" I tried to explain that as "consumers" of any environment, they had the right to expect a good fit--after all, they helped pay for all the public environment. They would pay even more, if that environment wasn't appropriately suited to their needs. I explained that, just as they knew what to buy in shoes, so should they know about their schools, houses, and city. This argument would not fail to bring their attention back--and the resultant discussion usually did capture their interest. But I could not deal with their basic hopelessness ("Aw, there ain't nothin' you can do".) except to say that it was my belief that no one had the right to give up until an effort had been made.

Inevitably, their attention would shift away from what I thought was important to learn to things which they found interesting. I found it counter-productive to interrupt them and force their attention back to the "development process", or "housing supply and demand". Toward

the end of the term, I grew more forceful, trying to use their comments and sidetracking to aid learning about the topic at hand. Sometimes, their digressions turned out better than what I could have hoped for; I was always trying to look for ways to create those spontaneous events, while not abandoning my own sense for what was important.

Trying to get the students to "do" anything was one of the greatest frustrations. They didn't (couldn't) "do" written homework. Their idea of "getting involved" was something almost entirely different from what I expected. I had no way of knowing what they were learning (I'd ask them, and they told me they'd "rather learn new things than answer questions about stuff they already knew"). I tried being loose, waiting for their questions to fill the air, and that didn't work; I tried giving written handouts, which they looked at once, but never twice. I thought their lack of involvement (as I defined involvement) was because each session wasn't structured enough. I was asking them, "What do you want to learn?", a question they had never been asked before. I was asking them to perform according to a model I had for their behavior, without fully sharing my expectations with them; but even sharing it isn't enough, for they were unused to acting upon what they learned in school. (Our best sessions were usually away from school, when we could more "be ourselves"). When I decided to go with their terms (i.e., when the atmosphere was right for a good discussion, we had one; if not, we didn't), I found myself easing up on them a lot more. I then began concentrating on how to create the proper setting; so that in case everyone came together, and their moods were right, and

there weren't distractions, the support would be there for good exchange. It took some time and experience with the students to develop that understanding, and I went through a lot of frustration prior to that.

Another frustration came from the lack of continuity from class to class. Any possibility of drawing from one day's learning or excitement on the next day was hopeless; if they came to school at all, students and non-students alike drifted around the classroom, talking amongst themselves if they had important gossip. Rarely did all the students come early enough in the period that we didn't have to repeat some of our discussions. If something we did in class (like mapping) really caught their attention, the students would put themselves to the task, but by the time the period ended, they would just only have begun. And the next day they came in, their mood would have changed so that they didn't want to work on that theme again. This was simply a value (continuity) that I had to learn was only important to me.

I learned to share the frustrations with the students. Once, when I was ready to quit because it didn't seem I could get a spark of enthusiasm from the students, they said: "We're comin' to the class, ain't we? That means we're interested!" And one of the students wrote, "At times, when the class wouldn't get started good, you more or less thought it was your fault." She implied that wasn't something I should take on myself. By sharing my frustrations, the class didn't become "they, the students; me, the teacher" - but rather we engaged commonly in an effort to learn. The lesson plans, writing the objectives and

thinking about what might happen, were hard to use in the class. But all this information helped me to reflect on the experience afterwards and spurred me on to think of different ways to initiate learning. I spent much time on plans, thinking that "better plans may insure success"; not true, I found--but after all, I am a planner! Documentation became helpful the further I got into the term.

So the development of a "style" emerged with an understanding of my expectations for the students; an understanding of the students' lifestyle, struggles, and motivations; the building of communication based on trusting each other's intentions; believing that we were there to learn, not just me there to teach. The major features of the educational process that hammered at my style in the classroom were the distractions, interruptions, and lack of day-to-day continuity; and managing what I wanted for the students and what they wanted for themselves.

The best learning experiences were ones which either tied to concrete experience (Housing Innovations, Roxbury Action, Public Facilities and the BRA, or the redesign of Dudley Station); or those which were self-revealing (neighborhood mapping, discussions about housing management) or involved curiosities (walking to Dudley Station, riding the train to the city, viewing the skyline of Boston, the slides of the prison). These were activities that were not interrupted (we were all together around a table or observing an action or scene) in which there was a figurative or literal cul-de-sac where we could pause and let thoughts sink in; where we could get a view on where we'd been and where we were going.

The original organization of the course did not differ very much from the Brockton outline. Students were asked to prepare a biography at the beginning to serve as an aid to the instructor in understanding the students; the students were then asked the questions, "What should Roxbury be?; What will Roxbury be?; and, What is Roxbury?" Early discussions wove in and around these three questions. It was thought that the students would become interested in exploring just what the extent of community resources were or what kinds of environmental problems troubled Roxbury; it was expected that their early period of question-asking would lead naturally into study of resources and problems. From the mid-term evaluation it was learned that students were too busy with other things (other schoolwork, after school jobs, caring for children) to complete this task. I later learned that, to some extent, the involvement of the students was compromised because they didn't know they were receiving course credit. Neighborhood analysis, at first thought to be a separate activity, became threaded through the course. The mapping of neighborhoods led to discussions of what resources and services were needed to run a community, how people use their outdoor spaces, and how the projects differed from private market housing. Field trips were interpreted in terms of "what services are provided to my community? Are these really beneficial?" The course alternated between field trips (public facilities, BRA, Roxbury Action Program, photographing the city, M.I.T., Housing Innovations, etc.) and discussions about services, housing

management, the development process, and what goes into a building. The course, however, never did bring the students to the point where they could work independently on a project or idea.

The ecology was built, but it took almost a quarter of the term before we learned how to communicate with each other, and what to expect of each other. It wasn't until the third week of the course that the attendance steadied; even then, shifting meeting times and places, and other distractions, cut into our momentum.

Despite the disorganization, students gained experience in several areas. They learned how to identify resources in the community, to read the quality of the environment, to understand maps and plans (though more than half weren't able to read scale, they understood directions and uses), and began to understand that there are a plurality in perceptions about the environment. About half the students gained in their ability to communicate verbally and visually, in the understanding of conceptual modelling in problem solving, and in their excitement about learning. Students didn't gain at all in the area of learning to work independently, in their understanding of problem solving techniques, in their ability to judge how much information is needed to solve a problem, nor did they learn how to continue their learning in these areas after the class had ended.

The Roxbury experience provided some more learning about the assumptions I made prior to the start of the teaching effort. I had assumed that the reason the Brockton course didn't get started the way we had planned was because the instructor didn't have a firm under-

standing of the material, or confidence enough in it to channel the students' discomfort and confusion. I learned that even where the instructor does have knowledge of and confidence in handling the material, the structural way one approaches the development of the classroom ecology is, indeed, more important than the teacher's personality. A good teacher may eventually overcome a poor curriculum--indeed, that may be a measure of a good teacher--but at least at the start, the way in which the student is approached is very important.

As in Brockton, the fundamental belief that development of "interest, confidence, and skills in studying and changing the environment is within the reach of high school students" was demonstrated. Students' interest in the problems of the urban environment was heightened, particularly by their observation of people who were trying to create some solutions. However, the aspect of skill acquisition is far less difficult a problem than trying to disarm the students' natural pessimism and cynicism that has cemented their apathy. This is a slightly different problem than the one Mr. Beals faced in Brockton, where the students felt the difficulty of making resource allocation decisions (i.e., jobs vs. parks?); with the Roxbury students, the common belief was that there wasn't anything you could do to solve any of the problems, as anything one tried was bound to fail. It is hard to maintain optimistic belief in action yourself when faced by their observations and the reality of the world as we know it today. But the luxury of not trying to solve the problems cannot be ours if we (as teachers or citizens or students, ourselves) expect to ever see anything

changed.

Several other assumptions were tested by the experience. That I was able to survive the teaching experience with no prior orientation to the likely problems surprised me; I did demonstrate that I could develop rapport with the students, but I had considerable difficulty managing my own reactions to setbacks and stresses incurred in the experience. Now, being outside the experience, it amazes me that I baldly assumed that I could handle the teaching role. Nonetheless, I did. I think I showed myself (at least) that it is within my abilities to create a learning environment where students feel valued and comfortable (as evidenced through their reports to that effect). As in Brockton, the notion that changes in behavior (as measures of learning) could be measured, or at least observed, was found to be the case. The students ostensibly did grow from having been engaged in the experience.

From the Brockton experience I concluded that the curriculum materials must be responsive to the changing classroom ecology. This lesson was reinforced and refined by the Roxbury experience. Two early assumptions premising both experiences were that "successful exercises could be devised and employed" (pg. 31) and "planned exercises were, indeed, an appropriate medium for environmental education" (pg. 31). The lesson I learned from Roxbury is that the planned exercises, laid out far in advance of knowing the students, their mood, the tenor of the times and so on, is not useful as a deterministic tool. Just as in preparation for baking a cake, one has a recipe and all the necessary ingredients, so is the "exercise planning" like preparing the recipe

and organizing the tools and resources needed for the right result. But, just as the cake needs the proper mixing and the right time and temperature, so, too, does the classroom ecology. Unlike the baking of a cake, however, you can't always adjust the oven's temperature - those classroom ingredients one brings together, and the proportions they are mixed in depend greatly for the appropriate mix on the 'temperature' of the classroom. In cooking, the temperature is the dependent variable; in teaching, all the resources and their mix are the dependent variables.

FOOTNOTES

INTRODUCTION

- 1 Davidoff, Paul. "Advocacy and Pluralism in Planning," Journal of the American Institute of Planners, Vol. XXXI, No. 4 (November 1965), pp. 331-338.
- 2 Peattie, L.R. "Reflections on Advocacy Planning," in Hans Spregel (ed.), Citizen Participation in Urban Development, NTL Institute for Applied Behavioral Science, 1968.
- 3 Alinsky, Saul. Rules for Radicals, New York: Vintage, 1971 and other work.
- 4 Turner, J.C. Freedom to Build, New York: MacMillan, 1972.
- 5 West, Troy. "Architecture 2000," Community Design Center in Pittsburgh, Pennsylvania.
- 6 Carew, Topper. "The New Thing Art and Architecture Center," Washington, D.C.
- 7 Bailey, Jack. San Francisco Community Design Center.
- 8 See "By the People," Progressive Architecture, February 1972 for an example from my own work.
- 9 See Parson, Harry A. Urban Education in the 1970's, New York: Teachers' College Press 1971; Coles, Robert. "Those Places They Call Schools," Harvard Education Review, Vol. 39, No. 4 1969; Weinstock, Ruth. The Greening of the High School, New York: EFL/IDEA 1973.
- 10 See Bremer, Anne and Bremer, John. Open Education, New York: Holt, Rinehart and Winston, 1972; Kohl, Herbert, 36 Children, New York: Signet, 1968; Rogers, Carl. "Student Centered Teaching" in Client Centered Therapy, New York: Houghton Mifflin, 1951.
- 11 For example, of the Title III projects funded in the State of Massachusetts, very few (Ecologue and Open City) were built-environment oriented. Of eight funded in 1974, only one is directed at the urban built-environment.

- 12 The Office of Environmental Education, headed by Walter Bergar, was established in 1970. In 1973, it dispersed \$1,115,000 and in 1974, \$2,300,000. From U.S. Department of Health, Education and Welfare, Environmental Education Projects (1973), Publication No. (OE) 74-15000.
- 13 These projects are ones for which adequate information could be obtained; as such, they are not necessarily representative of all that is done.
- 14 Zimberg, George, Director of the Urban Awareness Program, sponsored by the Boston Society of Architects.
- 15 Group for Environmental Education, Our Man-Made Environment, Book Seven, Philadelphia: 1215 Arch Street, 1970.
- 16 Hatch, C.R. Planning for Change, Lexington, Mass.: Ginn and Co., 1970.
- 17 Ballentine, Erna, Director, Community Interaction Through Youth, 675 Massachusetts Avenue, Cambridge.
- 18 Allied Professionals' Educational Consulting Services, Environmental Awareness course for University of Texas at Arlington, unpublished manuscript, 1971.
- 19 Smith, Scott. "Environmental Awareness: An Inservice Course for Teachers", in Journal of Architectural Education, Vol. XXV, Nos. 1,2,3, Summer 1974.
- 20 Mike Ertel is now at the Boston Architectural Center.
- 21 Marshall Kaplan, Gans, and Kahn, Children and their Urban Environment, Evaluation of WGBH's television program, "If You Live in a City, Where Do You Live?", New York: Praeger 1972.
- 22 Zren, Jim. "Children in Transit: The Open City Project", in Coates, Gary, Alternate Learning Environments, Stroudsburg, Pa: Dowden, Hutchinson and Ross, 1974; and conversations with Andy Merriell, Children's Museum Staff.
- 23 Moore, Robin. Washington Environmental Yard, Berkeley: University of California Lab School, 1972.
- 24 Herr, Philip et al, Ecologue/Cambridgeport Project, Washington, D.C.: Department of Health Education and Welfare, 1972.
- 25 Term presentation by Kathy Kane at M.I.T., November 1973.

THE CENTRAL QUESTION: HOW MIGHT HIGH SCHOOL STUDENTS BE ENGAGED IN DEVELOPING THEIR CONFIDENCE AND SKILLS IN STUDYING AND CHANGING THEIR ENVIRONMENT?

- 1 Op. Cit., Kohl; Op. Cit., Rogers; Postman and Weingarten, Teaching as a Subversive Activity, New York: Delta, 1969.
- 2 Dickey, Miriam, and Roth, Charles, Beyond the Classroom: Using the Urban Environment as an Instructional Medium, Lexington, Mass.: Audubon Society, 1972.
- 3 Ibid., page 2.
- 4 Ibid.
- 5 Ibid., page 7.
- 6 Op. Cit., Group for Environmental Education.
- 7 Gryllis, R.G., Environmental Education in Public Schools, unpublished M.I.T. architecture thesis, 1971, page 8.
- 8 Whitehead, A.N. The Aims of Education, New York: Free Press, 1968 edition, page 6.
- 9 Nicholson, S. "The Theory of Loose Parts", in Nicholson, Saul, Schreimer, B.K., In City Design Making, Milton Keynes New Tour: Open University Press, 1973.
- 10 Support for this notion can be found in the work of Richard Hatch, "Planning for Orange", and Doreen Nelson, "The City Building Educational Program" in Gary Coates, Alternate Learning Environments, pp. 36-58.

PRINCIPLES FOR GUIDING THE LEARNING PROCESS

- 1 Op. Cit., Journal of Architectural Education, page 46.
- 2 Op. Cit., Postman and Weingarten, page 17.
- 3 Cronbach, L. Educational Psychology, New York: Harcourt Brace and World, 1963, page 11.
- 4 See Op. Cit., Weinstock; Op. Cit., Kohl.
- 5 Illich, I. "Education Without School, How It Can Be Done", in CIVDOC Cuaderno Number 1014, Guadelajera, Mexico, page 5.

- 6 Op. Cit., Bremer, page 35.
- 7 Ibid., page 38.
- 8 Op. Cit., Cronbach.
- 9 Op. Cit., Postman and Weingarten, page 197.
- 10 Ibid., page 198.
- 11 Op. Cit., Bremer, page 5.
- 12 Ibid., page 8.
- 13 Ibid., page 28.
- 14 Op. Cit., Weinstock, page 50.
- 15 Op. Cit., Postman, page 32.
- 16 Op. Cit., Illich.
- 17 Op. Cit., Dickey
- 18 Op. Cit., Rogers, page 389.
- 19 Op. Cit., Cronbach, page 127.
- 20 Op. Cit., Kohl, page 31.
- 21 Op. Cit., Postman and Weingarten, page 50.
- 22 Kenniston, Kenneth. Notes on Committed Youths, New York:
Harcourt Brace and World, 1968, page 102.
- 23 Op. Cit., Postman and Weingarten, page 45.
- 24 Op. Cit., Kohl, page 33.
- 25 Op. Cit., Rogers.
- 26 Op. Cit., Postman and Weingarten. See also Frank Pressman,
"The Overlooked Position of Disadvantaged Groups", in
E.T. Keach, Education and Social Crisis, New York: Wiley
1967.
- 27 Op. Cit., Bremer, page 23.
- 28 Ibid.

- 29 Coleman, James. "The Children Have Outgrown the Schools", in Psychology Today, February 1972, page 75.
- 30 Op. Cit., Whitehead.
- 31 Op. Cit., Illich, page 5.
- 32 Op. Cit., Postman and Weingarten, page 19.
- 33 Ibid., page 198.
- 34 Op. Cit., Kohl, page 192.
- 35 Ibid., page 25.
- 36 Ibid.
- 37 Ibid., page 184.
- 38 Op. Cit., Bremer, page 37.
- 39 Ibid.
- 40 Op. Cit., Kohl.
- 41 Op. Cit., Gryllis, page 19.
- 42 Op. Cit., Kohl, page 54.

WHAT EXPERIENCES SHOULD STUDENTS BE ENGAGED IN TO DEVELOP THEIR CONFIDENCE AND ABILITY TO ACT ON THEIR ENVIRONMENTS?

- 1 Op. Cit., Cronbach, page 387.
- 2 Ibid., page 2.
- 3 Gary Hack; Cronbach. Educational Psychology; Kohl. 36 Children; Postman and Weingarten. Teaching As a Subversive Activity; the Bremers. Open Education.

APPENDIX A: A CASE STUDY IN ENVIRONMENTAL EDUCATION: BROCKTON, MASSACHUSETTS, 1973.

- 1 U.S. Census, 1970.
- 2 From curriculum package, August 1973.

- 3 From personal correspondence, January 1974.
- 4 Mr. Beals said, "The wall display of work encouraged students to talk with each other. This, in part, led to a feeling of 'groupness' by the end of the term. This is one of the objectives we had hoped to achieve."
- 5 We failed to use this well. We could have showed how values influence plans, how citizens' ideas should be important to the planning process ("but aren't", noted the students).
- 6 Not having had any contact with students during the development, the curriculum was a "shot in the dark". There was no prior critique of the course by anyone at the school. Some basic mistakes could have been avoided had we had the benefit of review of the course outline.
- 7 McHarg, Ian. Design with Nature, Natural History Press, 1969.
- 8 Fitch, J.M. American Buildings, the Environmental Forces That Shape It, New York: Houghton Mifflin, 1972.
- 9 Each student was interviewed individually, orally offering answers to questions about the content we covered. They were asked to interpret a site plan, in addition to answering questions about how they would solve a neighborhood problem, reasons for a public building being constructed where it was, identification of key governmental agencies.
- 10 From a student log book.
- 11 From a student log book.
- 12 From a student log book.
- 13 From a student log book.
- 14 From a student log book.
- 15 From a student log book.
- 16 From a student log book.
- 17 Such deviations were to be mutually approved. This action took place without discussion.
- 18 See earlier discussion of this in the body of the report.

APPENDIX B: A CASE STUDY IN ENVIRONMENTAL EDUCATION: ROXBURY
DISTRICT, BOSTON, MASSACHUSETTS, 1974

- 1 Archdiocese of Boston, Education Clearinghouse, 7 Marshall St., Boston (227-2200), Ms. Gay Dooley, Director.
- 2 It was later found that these attacks were by teenagers who did not attend the school.
- 3 Kohl, Op. Cit.
Bremers, Op. Cit.
Cronbach, L., Op. Cit.
- 4 None of the biographies and only three questionnaires were returned.
- 5 Roxbury Action Program is a group of development specialists in housing, small business administration, education, cultural arts founded in 1967, RAP aims to produce a "model block community"--it currently owns and manages a pharmacy and several dozen housing units. Expansion of their program is underway.
- 6 Next time around, I would try to get equipment for each student--use of 35 mm. camera did not work well--students couldn't get exposures, etc. This frustrated and disappointed the students.

This bibliography has been sub-divided into five parts, each part aimed for a slightly different audience. Each category is inclusive of the previous one.

First: Readings for students, covering (generally) planning process, housing, urban form, the natural climate and the built environment, the history of cities, and the future of cities.

Second: A collection of materials that focus on the Roxbury-North Dorchester area in Boston, useful for classroom teaching in that district.

Third: Background reading for teachers on economics, politics, the planning process, utopianism, and behavior in the environment.

Fourth: Materials on the educational process, and on problems of adolescence and poverty, that might aid teachers in structuring a learning experience.

Fifth: The references, in addition to all those above, which I used in the preparation of this work.

FOR STUDENTS: CONTENT

ABOUT URBAN ISSUES GENERALLY

Altschuler, Alan. The Planning Process, Ithaca: Cornell University Press, 1963.

Alexander, C. "A City Is Not a Tree," Architectural Forum, April and May, 1965.

Alexander, C. "Major Changes in Environmental Form Required by Social and Psychological Demands," in McQuade, W. Cities Fit to Live In, New York: McCullen, 1971.

Alinsky, Saul. "Of Means and Ends" in Rules for Radicals, New York: Vintage Edition, 1972.

Ashley, Meyer, Smith. "Signs and Street Appearance" from Systems for People on Foot.

Beinart, Julian. "The Pattern of the Street," Architectural Forum, September, 1966.

Blake, P. "The New Fifth Avenue," New York Magazine, 1971.

City of Boston Bicentennial Commission. Boston 200, Boston: Bicentennial Commission, 1973.

City of Boston Redevelopment Authority. Park Plaza: Myths and Facts, B.R.A., 1973.

Carr, Eugene. "How Skyscrapers Affect Wind" in Boston Record American, Sunday, October 24, 1971.

Cullen, G. The Concise Townscape, New York: Van Nostrand Reinhold, 1971.

Eldridge, W. Taming Megalopolis, New York: Archer, 1967.

Finrow, J. "Community Involvement, Pros and Cons" in McQuade, Cities Fit to Live In.

Firey, W. Land Use in Central Boston, New York: Greenwood Press, 1968.

Freeman, D. Boston Architecture, Kenbridge: M.I.T. Press, 1970.

- Fried, M. "Grieving for a Lost Home" in Wilson, Urban Renewal: The Record and the Controversy, Cambridge: M.I.T. Press, 1968.
- Friedan, F. "The Urban Housing Problem" in MacEwan and Weisskopf, Perspectives on the Economic Problem: A Book of Readings in Political Economy, Englewood Cliffs: Prentice Hall, 1973.
- Fusfeld, D. "The Ghetto Economy" in McEwan and Weisskopf.
- Gans, H. "Redevelopment of the West End" in Gans, H. The Urban Villagers, New York: Glencoe Free Press, 1962.
- Gold, R. "Urban Violence and Contemporary Defensive Cities" in McQuade, Cities Fit to Live In.
- Goldberg, T. "The Automobile: A Social Institution for Adolescents," Environment and Behavior, Vol. I, No. 2, December, 1969.
- Goldwasser, M. et al. An Investigation of the Small House, New York: Pratt Institute Department of Architecture, 1957.
- Goodman, R. "Toward Liberation" in Goodman, R. After the Planners, New York: Simon and Schuster, 1971.
- Group for Environmental Education, Yellow Pages of Learning Resources, Philadelphia: G.E.E., 1972.
- Grey, Bonstead; Winkel, Parker. People and Downtown, Seattle: University of Washington, September, 1970.
- Gruen, V. Boston CBD Planning Report, 1967.
- Howard, E. Garden Cities of Tomorrow, Cambridge: M.I.T. Press, 1965.
- Jackson, J.B. Landscapes, Amherst: University of Massachusetts Press, 1970.
- Jacobs, J. "The Uses of Sidewalks: Contact" and "The Uses of Sidewalks: Assimilating Children" in The Death and Life of Great American Cities, New York: Random House, 1969.
- Kaplan, M. "Advocacy and the Urban Poor" in McQuade. Cities Fit to Live In.
- Keller, Suzanne. The Urban Neighborhood, New York: Random House, 1968.

- Kenney, R. The Case for Park Plaza, B.R.A., April, 1972.
- Lavner, J. and Tefferteller, R. The Addict in the Street, New York: Grove Press, 1966.
- Lupo, Alan. Rites of Way: The Politics of Transportation in Boston and the U.S. City, Boston: Little Brown and Co., 1971.
- Liebow, E. Tally's Corner, Boston: Little Brown and Co., 1967.
- London County Council. The Planning of a New Town, London: L.C.C., 1961.
- Macauley, David. Cathedral, Boston: Houghton Mifflin, 1973.
- McHarg, Ian. Design with Nature, New York: Natural History Press, 1969.
- Nairn, I. The American Landscape, New York: Random House, 1965.
- Palen, J. and Fleming, K. Urban America, New York: Holt, Reinhart and Winston, 1972.
- Rasmussen, S. Experiencing Architecture, Cambridge: M.I.T. Press, 1959.
- Rainwater, L. "Fear and the House as Haven," Journal of the American Institute of Planners, January, 1965.
- Rappaport, A. House Form and Culture, Englewood Cliffs: Prentice Hall, 1969.
- Reps, The Making of Urban America, Princeton: Princeton University Press, 1965.
- Rouse Company, Visiting Guide to Columbia.
- Rudofsky, B. Architecture Without Architects, New York: Doubleday, 1964.
- Schorr, A. Slums and Social Insecurity, Washington, D.C.: U.S. Government Printing Office, 1963.
- Scott, B. and Venturi, R. "Co-op City, Learning to Like It," Progressive Architecture, February, 1970.
- Seeler, J.R. "The Slum: Its Nature, Use and Users," Journal of the American Institute of Planning, XXV, February, 1959.

- Shawcroft, B. (ed.) Building Skeletons, Raleigh: The Student Publication of the School of Design, Vol. 17.1.
- Shawmut National Bank. "Conventional Mortgage Loan Application".
- Ulrey, H. Architects and Builders Guide, New York: Theodore Aniel and Company, 1964.
- Wallace, A. "Planned Privacy: What is its Importance for the Neighborhood?", Journal of Housing, XIII, January, 1956.
- Warren, S.B. Street Car Suburbs: The Process of Growth in Boston, Cambridge: Harvard University Press, 1962.
- Weinstein, R. "How New York's Zoning Was Changed to Induce the Construction of Legitimate Theatres" in McQuade, Cities Fit to Live In.
- Woods, Robert and Kennedy, A. Zone of Emergence, Cambridge: Harvard University Press, 1962.
- Whitehall, W. Boston: A Topographical History, Cambridge: Belknap Press, 1959.
- Wurman, R. Making the City Observable, Cambridge: M.I.T. Press, 1971.

ABOUT ROXBURY

- Boston Architectural Center. Highlands Study, Boston: BAC, 1971.
- Boston Redevelopment Authority. Diagnostic Report: Residents of the Proposed Campus High School Early Acquisition Area, Boston: B.R.A., 1966.
- Highland Park Urban Renewal Area Survey and Planning Application, Boston: B.R.A.
- City of Boston Housing Inspection Department. "Community Improvement Program," Boston: Housing Inspection Department.
- "The Housing Code and its Enforcement in the City of Boston," Boston: Housing Inspection Department.
- City of Boston, Little City Halls. "Who Can You Talk To, Now That Uncle Charlie's Gone?", Boston: Little City Halls Program.

- City of Boston Public Facilities Department. "The Capital Improvements Program," Boston: Public Facilities Department.
- City of Boston Model Cities Program. Model Cities Profile, 1973, Boston: Model Cities Program, 1973.
- _____, Directory of Services, Boston: Model Cities, 1974.
- Fein. Frederick Law Olmsted and the American Environmental Tradition, New York: Brazillier, 1972.
- Housing Innovation, Inc. Physical Development Plan for the Boston Model Neighborhood Area, Boston: Housing Innovators, Inc., June, 1972.
- Joint Center for Urban Studies. How the People See Their City, Boston, 1969, Cambridge: J.C.U.S., 1969.
- Keyes, L. "BRP, An Independent Evaluation of its Costs and Benefits" in Boston University Urban Institute Monograph, Number 2, Innovations in Housing Rehabilitation.
- Lowry, M. Who's Running This Town? New York: Harper and Row, 1969.
- Roxbury Action Program. "Toward a Model Black Community," unpublished paper, 1973.
- _____, "Highland Park Study, 1973. Demographic Profile."
- _____, "A Study of Community Development. The Revitalization of John Eliot Square," 1973.
- Young, W. A Preliminary Exploration of Social Conditions and Needs in the Roxbury-North Dorchester Area, Boston: ABCD, 1967.
- Voorhees, Alan, et.al. Summary and Evaluation of the Southwest Corridor, Boston: Transportation Planning Review, 1972.
- Warner, S.B. The Discarded Suburbs: Roxbury and North Dorchester, 1800-1950, Boston: ABCD, 1961.

FOR TEACHERS: CONTENT

LITERATURE FOR TEACHERS--TO AID THEM IN UNDERSTANDING URBAN ISSUES

Alexander, C., Chermayeff, S. Community and Privacy, New York: Doubleday and Co., 1963.

Architecture Research Lab, University of Michigan. Environmental Evaluations: SER 2, Ann Arbor, University of Michigan Press, 1965.

Ardrey, Robert. The Territorial Imperative, New York: Atheneum, 1966.

Banfield, Ed. Political Influence, Glencoe, Illinois: Free Press, 1961.

Barnett, J. "Urban Design as a Part of the Governmental Process," Architectural Record, January, 1970.

Beck, R. "Spatial Meaning and the Properties of the Environment" in Environmental Perception and Behavior, Chicago: 1967.

Blake, Robert, et.al. "Housing, Architecture, and Social Interaction," Sociometry, XIX (June, 1956).

Boguslaw, Robert. The New Utopians, Englewood Cliffs: Prentice Hall, 1965.

Brolin, Brent and Zersel, John. "Mass Housing: Social Research and Design," The Architectural Forum, July-August, 1968.

Caso, Robert, The Power Broker, New York: Knopf, 1974.

Chapin, F. Stuart. "The Psychology of Housing," Social Forces, Fall, 1951.

Clay, Grady. Reading American Cities: Close-Up, New York: Praeger, 1973.

Cooper, Claire. House as Symbol of Self, Berkeley: Center for Planning and Development Research, Berkeley.

Downs, James. Principles of Real Estate Management, Washington: Institute of Real Estate Management, 1964.

- Etzioni, Amitai and Etzioni, Era. Social Change: Sources, Patterns, and Consequences, New York: Basic Books, 1964.
- Firey, W. "Sentiment and Symbolism as Ecological Variables" in Theodorsen, Studies in Human Ecology, New York: 1961.
- Fitch, James Marston. American Buildings, The Environmental Forces That Shape It, New York: Houghton Mifflin, 1972.
- Fried, M. and Gleicher, P. "Some Sources of Residential Satisfaction in an Urban Slum," Journal of the American Institute of Planners, XXVII (November, 1961), pp. 305-315.
- Gans, Herbert. The Urban Villagers, New York: Glencoe Free Press, 1962.
- _____, The Levittowners, New York: Pantheon Books, 1967.
- _____, People and Plans, New York: Basic Books, 1968.
- Hall, E.T. The Hidden Dimension, New York: Doubleday and Co., 1966.
- Handlin, Oscar and Buchard, John. The Historian and the City, Cambridge: M.I.T. Press, 1963.
- Kennedy, Albert and Woods, Robert. The Zone of Emergence, Cambridge: Joint Center for Urban Studies, abridged edition, 1962.
- Keyes, Langley. The Rehabilitation Planning Game, Cambridge: M.I.T. Press, 1969.
- Ladd, F.C. "Black Youths View Their Environments: Neighborhood Maps" in Environment and Behavior, Vol. 2, 1970, pp. 74-99.
- Lukashok and Lynch, K. "Some Childhood Memories of the City," Journal of the American Institute of Planners, Summer, 1956.
- Lynch, Kevin. Image of the City, Cambridge: M.I.T. Press, 1960.
- _____, Site Planning, Cambridge: M.I.T. Press, 1962.
- Michelson, W. Man and His Urban Environment, Reading, Mass.: Addison Wesley, 1970.
- Mills, C.W. (ed.). Power, Politics and People, New York: Oxford University Press, 1961.

- Mumford, L. The City in History, New York: Harcourt Brace and World, 1961.
- Newman, Oscar. Defensible Space, New York: Macmillan, 1972.
- Perin, C. With Man in Mind, an Interdisciplinary Prospectus for Environmental Design, Cambridge: M.I.T. Press, 1970.
- Proshansky, et.al. Environmental Psychology, New York: Holt, Reinhart and Winston, 1970.
- Rettig, R.B. Guide to Cambridge Architecture: Ten Walking Tours, Cambridge: M.I.T. Press, 1969.
- Rosenblum, J. "The Boston Redevelopment Authority," Cambridge: Harvard Business School Case Study, 1969.
- Rossow, W. "The Social Effects of the Physical Environment," Journal of the American Institute of Planners, Vol. 27, 1961, pp. 127-133.
- Sanoff, H. Behavior Settings in Residential Environments, Journal of Architectural Education, Fall, 1971.
- Schon, D. and Duhl, L. Deliberate Social Change in the City, a bibliography, Monticello, Ill: Council of Planning Librarians, 1972.
- Sommer, R. Personal Space, the Behavioral Basis of Design, Englewood Cliffs: Prentice Hall, 1969.
- Stegman, M. Housing Investment in the Inner City, Cambridge: M.I.T. Press, 1972.
- Stein, Clarence. New Towns for America, New York: Reinhold, 1951.
- Sternleib, G. The Tenement Landlord, New Brunswick: Rutgers University Press, 1969.
- Stevens and McNulty. World of Variation, Boston: I. Press, 1970.
- Van Dyke, V. Political Science: A Philosophical Analysis, Stanford University Press, 1960.
- Warner, S.B. Planning for a Nation of Cities, Cambridge: M.I.T. Press, 1966.

- Wilson, J.Q. Urban Renewal: The Record and the Controversy,
Cambridge: M.I.T. Press, 1966.
- Webb, E. et.al. Unobtrusive Measures, Chicago: Rand McNally, 1966.
- Webster, D. Urban Planning and Municipal Public Policy, New York:
New York: Harper and Row, 1958.
- Whyte, W. Street Corner Society: The Social Structure of an Italian
Slum, Chicago: 1961.

FOR TEACHERS: PROCESS

The following are references I used in developing this study and in teaching. Most of these entries concern themselves with the educational process; I think they would be found useful by a teacher or one who proposes to teach.

- Barghart, Frank and Trull, Albert. Educational Planning, New York:
Macmillan, 1973.
- Big Rock Candy Mountain. Menlo Park, California: Portola Institute.
- Bremer, A. and Bremer, J. Open Education, New York: Vintage Edition,
1963.
- Calitri, Charles. "Nature and Values of Culturally Different Youth"
in E.T. Reach (ed). Education and Social Crisis: Perspectives
on Teaching Disadvantaged Youth, New York: Wiley, 1967.
- Coates, Gary (ed). Alternative Learning Environments, Stroudsburg,
Pa.: Dowden, Hutchinson and Ross, Inc., 1974.
- Coles, Robert. "Those Places They Call Schools," Harvard Education
Review, Vol. 39, No. 4, 1969.
- Cronbach, Lee. Educational Psychology, New York: Harcourt, Brace
and World, 1963.
- DeCarlo, Giancarlo. "How/Why to Build School Buildings," Harvard
Education Review, Vol. 39, No. 4, 1969.
- Deutsch, Martin. "Perspectives on the Education of the Urban Child"
in Harry Rossow (ed). Urban Education in the 1970's,
New York: Teachers' College Press, 1971.

- Drake, Russell. "Perception, Recall and Cognitive Levels" in Student Publication of the School of Design, NCSU, Raleigh, N.C., Vol. 19:1.
- Freire, Paulo. Pedagogy of the Oppressed, New York: Herder and Herder, 1972.
- Group for Environmental Education. Our Man-Made Environment: Book Seven, Philadelphia, G.E.E., 1970.
- Harlem Youth Opportunities Unlimited, Inc. Youth in the Ghetto: A Study of the Consequences of Powerlessness, New York: Haryou, 1964.
- Illich, Ivan. "Education Without School: How it Can be Done," CIDOC Cuaderno, No. 1014.
- Kohl, Herbert. 36 Children, New York: Signet, 1968.
- Kozol, Johnathon. Death at an Early Age, New York: Bantam, 1967.
- Leacock, Eleanor B. Teaching and Learning in City Schools: A Comparative Study, New York: Basic Books, 1969.
- Passow, Harry. Urban Education in the 1970's, New York: Teachers' College Press, 1971.
- Payne, Stanley. The Art of Asking Questions, Princeton: Princeton University Press, 1965 (7th printing).
- Rainwater, Lee. "Crucible of Identity: The Negro Lower Class Family" in E.T. Keach (ed). Education and Social Crisis: Perspectives on Teaching Disadvantaged Youth, New York: Wiley, 1967.
- Reissman, Frank. "The Overlooked Position of Disadvantaged Groups" in E.T. Keach (ed). Education and Social Crisis: Perspectives on Teaching Disadvantaged Youth, New York: Wiley, 1967.
- Rogers, Carl. "Student Centered Teaching" in Rogers, Carl. Client Centered Therapy, New York: Houghton Mifflin, 1951.
- Sexton, Patricia Cayo (ed). Readings on the School in Society, Englewood Cliffs: Prentice Hall, 1967.

Southworth, Michael. An Urban Service for Children Based on an Analysis of Cambridgeport Boys' Conception and Use of the City, Ph.D. dissertation, Department of City Planning, M.I.T., 1970.

Strodtbeck, F. "The Hidden Curriculum of the Middle Class Home" in C.W. Hunnecut (ed). Urban Education and Cultural Deprivation, New York: Syracuse University Press, 1965.

_____, "Family Interaction, Values and Achievement" in D.C. McClelland (ed). Talent and Society: New Perspectives in the Identification of Talent, Princeton: Van Nostrand, 1958.

Toffler, Alvin (ed). The Schoolhouse in the City, New York: Praeger, 1969.

Weinstock, Ruth. The Greening of the High School, New York: EFL, 1973.

In addition to those mentioned above, I used these references in developing the study:

Action for Boston Community Development. A Proposal to Demonstrate Programs for Culturally-Disadvantaged Children in the Boston Public Schools, Boston: ABCD, 1963.

Allied Professionals Educational Consulting Services. Environmental Awareness Course for the University of Texas at Arlington, Arlington, Texas: A.P.E.C.S., 1971.

American Institute of Architects. Environmental Education Guidebook, Washington, D.C.: A.I.A., 1970.

Benig, Irving. The Children: Poetry and Prose from Bedford-Stuyvesant, New York: Grove Press, 1971.

Carr, Stephen and Lynch, Kevin. "Where Learning is Happening," in Daedalus, Fall, 1969.

Coleman, James. "The Children Have Outgrown the Schools," Psychology Today, February, 1972.

Cox, D.W. The City as a Schoolhouse: The Story of the Parkway Program, Valley Forge, Pa.: Judson Press, 1972.

- Davidoff, Paul. "Advocacy and Pluralism in Planning," Journal of the American Institute of Planners, Vol. XXXI, No. 4, (November, 1965), pp. 331-338.
- Dickey, Miriam and Roth, Charles. Beyond the Classroom: Using the Urban Environment as an Instructional Medium, Lexington, Mass.: Massachusetts Audubon Society, 1972.
- Educational Facilities Laboratory, National Education Association, and National Park Service. Environmental Education/Facility Resources, New York: EFL, 1972.
- Places for Environmental Education, New York: EFL, 1971.
- U.S. Department of Health, Education and Welfare. Environmental Education Projects 1973, Government Printing Office, No. (OE)74-15000; 1974, report forthcoming.
- Gryllis, R.G. Environmental Education in Public Schools, M.I.T. Architectural Department thesis, 1971.
- Hatch, C. Richard. Planning for Change: Neighborhood Design and Urban Politics in the Public Schools, Lexington, Mass.: Ginn and Co., 1970.
- Herr, Philip et.al. Ecologue/Cambridgeport Project, U.S. Department of Health, Education and Welfare, Office of Environmental Education, 1972.
- Jones, Ron W. "Your City Has Been Kidnapped," Deschool Primer, No. 3, published by Zephyrus, Berkeley, California, 1972.
- Kaplan, Marshall and Gans and Kahn. Children and the Urban Environment: A Learning Experience, New York: Praeger, 1972.
- Kenniston, Kenneth. Young Radicals: Notes on Committed Youth, New York: Harcourt, Brace and World, 1968.
- Lazerson, Marvin. Origins of the Urban School: Public Education in Massachusetts, Cambridge, Mass.: Harvard Press, 1971.
- Mood, Alexander. "Teacher Characteristics and Their Influence on Pupil Performance," in Bruno, James. Emerging Issues in Education, Lexington Books, 1972.
- Moore, Robin. Open Space Learning Place, Berkeley: New School of Education Journal/Department of Landscape Architecture, 1973.

- Washington Environmental Yard, Berkeley: University of California Laboratory School, 1972.
- An Experiment in Playground Design, Master of City Planning thesis, 1966.
- Murphy, Jim. "By the People," Progressive Architecture, February, 1972.
- Nicholson, Simon and Shreiner, B.K. Community Participation in City Decision-Making, Milton Keynes New Town, Great Britain: Open University Press, 1973.
- Osborne, Michelle. "What's My Environment? And What Can I Do About It?", Philadelphia Sunday Bulletin, September 22, 1968.
- Peattie, L.R. "Reflections on Advocacy Planning" in Hans Spiegel, Citizen Participation in Urban Development, Washington: NTL Institute for Applied Behavioral Science, 1968.
- Pratt, James (ed). Environmental Education Guidebook, Washington, D.C.: A.I.A., 1970.
- Postman, Neil and Weingartner, Charles. Teaching as a Subversive Activity, New York: Delta Press, 1969.
- Ryder, Lee. "Kid Stuff," Progressive Architecture, February, 1972.
- Schon, Don. Beyond the Stable State, New York: Random House, 1971.
- Steptoe, John. Uptown, New York: Harper and Row, 1970.
- Turner, J.C. Freedom to Build, New York: MacMillan, 1972.
- Webb, Bruce. ACSA Environmental Experience Stipends Program Yearbook, Journal of Architecture Education, Vol. XXV, Nos. 1,2,3, Summer 1974.
- Whitehead, Alfred North. The Aims of Education, New York: Free Press, 1967 edition.
- Wurman, R. "The Invisible City" in Architectural Forum, May, 1972.
- Zien, Jim. "Children in Transit: The Open City Project" in Coates, Alternative Learning Environments.