TRANSFER EFFECTS OF "MAN: A COURSE OF STUDY" (MACOS) TO OTHER ELEMENTARY SCHOOL SUBJECTS

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
RONALD ALLEN HAGER
1971

This is to certify that the

thesis entitled

"Transfer Effects of MAN: A Course Of Study (MACOS); to Other Elementary School Subjects."

presented by

Ronald Allen Hager

has been accepted towards fulfillment of the requirements for

Ph. D. degree in Elementary and Special Education

William W. Boyle

Date 6-29-71

671596

ABSTRACT

TRANSFER EFFECTS OF "MAN: A COURSE OF STUDY" (MACOS) TO OTHER ELEMENTARY SCHOOL SUBJECTS

By

Ronald Allen Hager

The purpose of this study has been to examine the transfer effects of Man: A Course of Study (MACOS) to other elementary subjects. MACOS is a unique social studies approach for elementary teachers and students which incorporates a teaching learning process that requires rather extensive change in style from the usual method found in elementary social studies. Researchers previously had not empirically studied the influence of MACOS on other subjects taught in the elementary school curriculum. The sixth grade teachers and students of Jefferson School in Mason, Michigan, experienced MACOS for the first time this year (1970-71). Since the design of the course includes a process that extends beyond the usual school curriculum, specific questions as to the transfer effects of the MACOS process were raised.

Two hypotheses were empirically examined to help indicate the transfer effects of the course.

H_o1--There seems to be a transfer effect of the MACOS process as reflected in the teachers' written class objectives and procedures, to English and science classes.

H_o2--Students who experience developmentally the MACOS process seem to gradually recognize the MACOS principles enacted in their: 1) English classes, 2) science classes, and 3) MACOS classes.

Data in relationship to the two above hypotheses were generated by use of three specifically designed instruments. (1) A list of nine validated MACOS principles were compared to teachers' written objectives/procedures in MACOS, English, and/or science classes. (2) A brief form was designed to record the objectives/procedures. Two specially trained Raters numerically judged each set of objectives/procedures in relation to closeness to the Nine MACOS Principles. (3) Additional numerical data were gathered from a random sample of ten students from each of the three classes (MACOS, English, science) by use of a specifically designed questionnaire. Three statistical methods (correlations, t-test, two-way analysis of variance) were used to indicate if there was any statistical significance as to the transfer effects.

Additional information was gathered from a Teacher Opinionaire. Essentially this instrument reflected the teachers' perceived impact of the MACOS process on themselves and their students in MACOS, English, and science classes.

Results and Conclusions of the Study

Results of this study, although not conclusive, seem to indicate that Man: A Course of Study has limited influence on changing the teaching styles of teachers in English and science classes at Jefferson Elementary School, Mason, Michigan. These results appear to be significant in terms of the first year's exposure of the MACOS concepts (represented by the Nine MACOS Principles) used to measure the transfer effects.

Results from within the MACOS classes themselves seem to indicate the principles underlying the course were in operation. Essentially this was reflected in the Raters' judgment of teacher objective/procedures for MACOS classes and the students' perceptions indicated in their questionnaire. This seems to be consistent with other research and reactions concerning MACOS; therefore, could be

considered additional evidence of the effectiveness of the course design to change teacher and student behavior in social studies.

The results of the Teacher Opinionaire which reflected their perceived influence of MACOS supported the empirical findings. Essentially, they perceived no influence of MACOS on change of teaching style in science and English. Further, they felt no change in student behavior except, most teachers of English felt that generally students were more alert and questioned more as compared to last year. Regarding the MACOS classes, teachers generally felt there was a change in their teaching style as compared to last year's social studies class methods. The Opinionaire cited their feelings of being more open and flexible in response to students and content. They perceived students as being more enthusiastic and more responsive in social studies.

TRANSFER EFFECTS OF "MAN: A COURSE OF STUDY" (MACOS) TO OTHER ELEMENTARY SCHOOL SUBJECTS

By

Ronald Allen Hager

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Elementary and
Special Education

1971

ACKNOWLEDGEMENTS

Organizing and completing a dissertation is a singular effort, but it cannot be accomplished without the cooperation and the contributions of a number of people. The writing of this dissertation was no exception and the author would like to acknowledge the varied efforts of the people who contributed.

The writer is most appreciative of the chairman of his doctoral committee, Dr. William Joyce, for his show of confidence in this author and for his sound editorial and professional contributions.

Dr. Glen O. Cooper, whose honesty and unflinching support aided this author immeasurably. His efforts were deeply appreciated.

Grateful acknowledgement is extended to Dr. Dale Alam for having the courage to be and a relentless trust in people.

Dr. Lawrence Sarbaugh, who in his kindness, took on the additional responsibility of helping on this

author's committee even though he was already excessively burdened.

Most of all, for my great mate, Barbara, who kept the faith and acted as a buffer for my cantankerous spirit.

To my children, Eric, Marty, Lyle, and Dean, who sacrificed their allowances, their pitcher, referee, fishing mate, fellow wrestler, and all recreations costing above fifty cents.

Special thanks to the author's friends, Dr. Robert Russo, Dr. Merrill Harmin, Dr. Charles Raebeck, and Dr. Ethan Janove who added the necessary emotional encouragement to pull this caper off.

To John Thomas Murphy for his good humor and willing ears that absorbed this author's tongulations.

The Jefferson Elementary School staff in Mason, Michigan, for their patience and considerations.

Dr. John Herlihy, for sharing his time and insights regarding the MACOS program.

Finally, this author's students, friends, and neighbors who made the one year's adventure at Michigan State University a warm and human endeavor.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

LIST OF TABLES

CHAPTER I

BACKGROUND OF THE STUDY

> The school is an entry into the life of the mind. It is, to be sure, life itself and not merely a preparation for living. But it is a special form of living, one carefully devised for making the most of those plastic years that characterize the development of homo sapiens and distinguish our species from all others. School should provide more than a continuity with the broader community or with everyday experience. It is primarily the special community where one experiences discovery by the use of intelligence, where one leaps into new and unimagined realms of experience, experience that is discontinuous with what went before. A child recognizes this when he first understands what a poem is, or what beauty and simplicity inhere in the idea of the conservation theorems, or what measure is universally applicable. If there is one continuity to be singled out, it is the slow converting of the child's artistic sense of the omnipotence of thought, into the realistic confidence in the use of thought that characterizes the effective man.[1]

Jerome Bruner wrote the above statement more than ten years ago. Since then he has contributed numerous innovative programs to help improve and change the educational process. A recent contribution, Man: A Course of

---

[1]Jerome S. Bruner, On Knowing: Essays for the Left Hand, Belknap Press, Harvard University, 1962, pp. 118-119.

Study (MACOS), an elementary social studies program, has aroused considerable curiosity. This year-long course for ten-year-olds continues to be discussed at educators' conferences and in the professional literature.[2]

MACOS is complex, and despite the publicity it has received, it remains one of the least understood of the new social studies programs.[3] Curriculum Development Associates, Inc., which is now the distributor of the program, requires teachers to participate in intense in-service training programs before teaching the course. Materials included in the course are extensive (films, records, games, booklets, and pictures) therefore requiring a greater initial cost than most other courses.

MACOS is unique. Its theoretical base departs from that of most social studies approaches in elementary school. None of the twenty-six new social studies programs appraised by Sanders and Tanck in the April, 1970 issue of Social Education require such extensive pre- and in-service training. The specialized educational philosophy and the diversity of materials make specialized

---

[2]William W. Joyce, "MACOS: A Report from the Inner-City," Social Education, March, 1970, p. 1.

[3]Ibid.

teacher training necessary. In fact, as noted earlier, pre- and in-service training of teachers is required before the course materials can be purchased. No recent elementary social studies course seems to potentially require such depth in thinking. In general, the course involves abstract thinking and learning strategies not ordinarily ascribed to elementary teachers and students. It implies dramatic changes within the classroom for both teachers and students. Teachers tend to adopt a more flexible, open teaching style.[4] Instead of dominating the classroom, they act as guides and resource persons to groups of students. Students seem to become much more secure and are willing to risk guessing as well as pursuing concepts intuitively. The basic social change in the classroom is altered from a teacher-directed to a socially-cooperative learning process. Regarding the purposes of MACOS Bruner has indicated:

> Man: A Course of Study was designed to give teachers the kind of backup that made it possible for them to get some insight into the materials and to start some rather difficult-to-predict discussions and projects.[5]

---

[4]Richard Bumstead, "Man: A Course of Study," Educate, September, 1970, pp. 38-39.

[5]Jerome Bruner and Elizabeth Hall, "Bad Education, a Conversation with Jerome Bruner," Psychology Today, 4:7, December, 1970.

The following three questions define the framework and general thrust of the course content. (1) What is human about human beings? (2) How did they get that way? (3) How can they be made more so?--The course content extends to the nature of man as a species and the forces that shaped and continue to shape his humanity.[6] In Bruner's words,

> We want to give children some appreciation of what a fantastic species man is--that he's not helpless, that he's capable of growth, of amplifying his own powers by culture.[7]

MACOS AND BRUNERIAN LEARNING THEORY

MACOS exemplifies Bruner's theories of learning. The following discussion will present these theories, in an attempt to clarify the theoretical rationale of this thesis.

Bruner states in The Process of Education[8] that a central purpose of education is to help students to

---

[6] Man: A Course of Study, a pamphlet, Curriculum Development Associates, Inc., Washington, D.C., p. 1.

[7] Ibid., p. 1.

[8] Jerome S. Bruner, The Process of Education, New York: Random House, 1960.

utilize their full intellectual powers.[9] Further, he indicates in this book his basic concepts about process education. Four themes are developed within Bruner's book which indicate a new direction for curriculum and teaching: 1) role of structure; 2) readiness for learning; 3) nature of intuition; and 4) desire to learn. These themes along with their assumptions formulate what Bruner means by process education and are an intricate part of Man: A Course of Study.

Role of Structure

Role of structure implies the basic concept of how to make the limited exposure students have to their learning materials count for the rest of their lives.[10] A consistent view of men who have dealt with this concept agree that the answer lies in giving students an understanding of the fundamental structure of whatever subject is taught.[11] This concept is counter to the usual emphasis on mastery of facts and techniques. It entails, among other things,

---

[9] Ibid., p. 10.

[10] Ibid., p. 11.

[11] Ibid., p. 11.

supporting habits and skills that make possible the active use of materials one has come to understand.[12] According to Bruner:

> Grasping the structure of a subject is understanding it in a way that permits many other things to be related to it meaningfully. To learn structure, in short, is to learn how things are related.[13]

Regarding teaching style, two important concepts prevail in relation to the role of structure. The first is to construct a curriculum that is practical (taught by ordinary teachers and students) and have it so designed that it will reflect the underlying principles of various fields of inquiry.[14] These underlying principles would be paramount to the curriculum. The second concept requires the matching of the levels of materials to the capacities of students of differing abilities.

In the design of MACOS, the roles of structure and teaching style received considerable emphasis.

---

[12] Ibid., p. 12.

[13] Ibid., p. 7.

[14] Ibid., p. 18.

Readiness for Learning

Readiness for learning implies that "the foundation of any subject may be taught to anybody at any age in some form" (Bruner). Here Bruner is alluding to the fact that schools may be wasting students' intellect by not involving them in more complex, intellectual problems earlier. Certain basic ideas to any subject are as simple as they are powerful. Understanding these basic ideas requires a developmental process that continually grows in depth as they are used in various forms. Here, Bruner is not implying a formality of teaching in a step by step sequence but an involvement on an intuitive, "playing around" level. For example, fourth grade children can play involved games governed by principles of topology and set theory or grasp ideas of tragedy without going through formalized equations or elaborated verbal concepts.[15]

Man: A Course of Study incorporates the readiness theme and assumes the capability of young children (10-12 years old) to "think big."[16] This is evident as part of

---

[15] Ibid., p. 13.

[16] Nancy Hicks, "10-Year-Olds Encouraged to Think Big," The New York Times, November 16, 1969.

the content involves such concepts as life cycle, instinctive and learned behavior, and dependency.

Nature of Intuition

The Nature of Intuition theme involves the intellectual technique of arriving at plausible but tentative formulations without going through the usual, sequential analytic steps.[17] Intuitive thinking, according to Bruner, is the training of hunches. He feels this is a much neglected feature of productive thinking in and out of the classroom.

Citing the characteristics of intuitive thinking, Bruner points out:

> Such thinking does not advance in careful, well defined steps.
>
> The thinker arrives at answers with little awareness of how he arrived.
>
> Intuitive thinking usually relies on familiarity with the domain of knowledge involved and with its structure. This provides the grounds for the thinker to leap about employing various techniques to reach a conclusion.[18]

---

[17] Bruner, op. cit., p. 58.

[18] Ibid., p. 58.

Part of the process in MACOS concerns itself with helping promote intuitive thinking. Students are encouraged to make guesses, follow hunches, and not to be worried about mistakes.

Desire to Learn

Desire to Learn theme relates to the motivators of learning and how they may be enacted. In his later book, Toward a Theory of Instruction, Bruner stresses the importance of the will to learn as it emanates from such factors as curiosity, competence, identification, and the need to respond to others. Further, he points out that it (will to learn) is the single factor most characteristic about human beings, and children have intrinsic motives to learn. In other words, children naturally engage in learning for the sake of learning or for the internal reward.

Curiosity.--Curiosity is one of the early investigators of learning and is similar to the intrinsic motive.[19] Attention is drawn to something that is unclear,

---

[19]Jerome Bruner, Toward a Theory of Instruction, Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1966, p. 114.

unfinished or uncertain.[20] For example, watch a child build a pile of blocks as high as he can. Attention will be retained until the point is reached where the pile crashes down. According to Bruner, the drama of the task is minor. More important is "the energizing lure of uncertainty made personal by one's own efforts to control it."[21]

Important in the process of this form of curiosity is helping the student channel it. Included in the MACOS course are two extensive simulation games (caribou hunting and seal hunting) which have been designed to capture a child's curiosity and help direct it toward more powerful intellectual pursuits. The child, through imagination, thinks like an Eskimo using the logic necessary to successfully hunt the caribou and seal.

Competence.--According to Bruner, competence has to do with developing the ability to cope with the environment. Primarily, he equates it to learning by emphasizing that to sustain interest in an activity requires some degree of competence. In other words, as he puts it, "we get interested in what we get good at."

---

[20] Ibid., p. 114.

[21] Ibid., p. 117.

Identification.--The strong human tendency to model or develop one's image based on some other person refers to the identification theme, according to Bruner.[22] For children, models control a resource for desired success as a person. Most important in the identification with models (such as teachers) is that there be attainable interaction with them. The teacher transmits attitudes toward a subject and indeed attitudes toward learning.[23]

MACOS places considerable emphasis on the pattern and quantity of interaction between student and teacher. Teachers are faced with personalized interaction with children, often developed around speculation within open ended questions.

The need to respond to others, or reciprocity. This is the fourth and final instigator in the will to learn. Bruner places much importance on this because he sees it as a basic human need. It relates to, but is not the same as "motive to conform."[24] Bruner defines the need as one of fitting individual efforts together into a group

---

[22] Ibid., p. 122.

[23] Ibid., p. 123.

[24] Ibid., p. 125.

enterprise. Although little is known about the motive to reciprocate there are indicators that it can furnish a strong force to learn.[25]

Within the MACOS course, students often work in small groups to test their intuitive thoughts and to share in a joint enterprise.

For Bruner, the motivating factors that comprise the _will to learn_ are of primary importance in structuring the classroom learning environment. He sees them as replacing the more usual structuring forces of status-defined roles such as student, teacher, authority.[26] The child-centered approach emphasized in MACOS enhances the development of the _will to learn_.

Enactive, Iconic and Symbolic Modes

Bruner has theorized that humans translate their experiences into a model of the world in three modes: through action, image, and symbol (the enactive, iconic,

---

[25] _Ibid._, p. 125.

[26] Janet P. Hanley, Dean K. Whitla, Eunice W. Moo, and Arlene S. Walter, _Curiosity/Competence/Community: An Evaluation of Man: A Course of Study_, Cambridge, Mass.: Education Development Center, Inc., 1970, Vol. I, pp. I-2, 3.

and symbolic modes).[27] Enactive refers to that learning which is gained through actual experience and cannot be taught (child learning how to ride a bike or roller skate). Iconic represents the perceptual organization that takes place within the mind. It is the insight which the learner gains through experience. Finally, the symbolic is translating experience and perception into symbols (words) which attempt an explanation of reality. Materials used in MACOS attempt to integrate all three modes of learning, however, the iconic and symbolic modes receive more emphasis.[28]

Discovery Learning-- Hypothetical Mode

Bruner wrote an article entitled "The Act of Discovery" (1964) and in it distinguished between teaching in the "expository mode" and teaching that used a "hypothetical mode." The former dealt with decisions (about manner, pace, and style of exposition) determined by the teacher as expounder.[29] The latter involved the teacher and pupil in

[27] Bruner, op. cit., pp. 10-11.

[28] Hanley, et al., op. cit., p. I-7.

[29] Sue A. Deffenbaugh, Susan M. Dalfen, Richard E. Ripple, An Investigation of an Instrument Battery Related

a cooperative position regarding decisions.[30] Students were actively engaged in the class process, therefore, were aware of what was developing. The teacher primarily helped students become independent, self-directed thinkers. Bruner's distinction between these two modes is very similar to teacher-centered vs. student-centered instruction. Further, his distinctions are related to promoting discovery learning in the classroom. The hypothetical mode, along with discovery, is reflected in the pattern of teacher behavior encouraged in MACOS.[31]

MACOS as it Exemplifies Bruner--A Summary and Critique

MACOS reflects a Brunerian view in attitude and scope. The course is intended to actualize the motivators of learning (curiosity, competence, identification, and reciprosity) and the curriculum concepts of structure,

---

to the Expectancies for Student-Centered Teaching Behaviors in Man: A Course of Study, Dept. of Ed., Cornell University, Ithaca, New York, 1970. Final report Eastern Regional Institute for Education, Syracuse, New York, p. 10.

[30] Ibid., p. 10.

[31] Ibid., p. 10.

readiness, intuitive thinking, and desire to learn, previously described.[32] Learning methods, data sources, and classroom techniques have been developed to implement the major conceptual themes. According to Bruner, humans translate personal experiences into a conceptualization of the world in three ways: through action, image, and symbol (the enactive, iconic, and symbolic modes).[33] Man: A Course of Study attempts to integrate these three modes in the materials designed for the course.

Bruner places little emphasis on a step-by-step, carefully sequenced approach to learning. His goals center more around the process of learning,[34] rather than around the product. As he has suggested, these goals put highest emphasis on the community of education, on exploration, and on question posing, rather than on factual specifics of information per se.[35] He is more concerned that the child

---

[32]Hanley, et al., loc. cit.

[33]Bruner, loc. cit.

[34]Hanley, et al., op. cit., p. I-4.

[35]Process learning is defined and discussed under definition of terms, pp.

experience the manipulation of materials as well as deal with incongruities or contrasts.[36]

The following overview of MACOS (from Educational Development Center, Inc., Cambridge, Massachusetts) is included to give the reader some notion of how Jerome Bruner's theories of learning are actualized in Man: A Course of Study.

> Man: A Course of Study has two major units: "Man and other Animals," the section including the animal studies of salmon, herring gull, baboon, chimpanzee and others; and the section studying the lives of the Netsilik Eskimos in the Pelly Bay region of Canada. The brochure describing the course summarizes as follows:
>
> The materials fall into three categories: film and other visuals, written materials, and enactive devices such as games. Film is the primary source of data in the course. In color, with natural sound and a minimum of commentary, it is used to simulate field observations. Children gather information and form questions on the basis of repeated viewings in small or large groups.
>
> Twenty-three booklets of differing style and purpose replace the usual textbook. Some booklets supply data for various units. Others stress concepts such as adaptation, and their use spans several units. In addition, there are field notes, journals, poems, songs, and stories.

---

[36] William W. Joyce, Robert G. Oana, and W. Robert Houston, Elementary Education in the Seventies, Holt, Rinehart and Winston, Inc., 1970, pp. 38-39.

Games, construction exercises, and observation projects are other learning activities that permit children to work with a minimum of teacher direction in small groups and individually.

To help teachers adjust to these new demands and to encourage professional growth, a workshop program using readings, tapes and films designed exclusively for teacher use accompanies the course. Twenty suggested sessions built around issues of content and pedagogy constitute the substance of the workshop series that runs concurrently with the course.

Films and records, readings, and continual use of classroom discussion activities stress the interaction of the visual and aural with students' manipulation of ideas through language. As brief illustrations of integrated activities, the following two examples will orient the reader. The lessons with which the course begins concern the life cycle of humans and other animals. Making life ropes of various stages in life cycles, children construct from paper and string, clips or scotch tape, a physical representation of the idea. The cycle itself is an exercise in model-building, an organizing method of viewing sequential stages of growth and development. The suggested discussion following construction of the life cycle of a human, for example, then is focused around verbal manipulation of the model, examining the common element in the life cycles of all creatures, and the elements that may be unique to an individual and within species. The construction of a "baboon environment board" several weeks later is another integrated activity, where children work with their hands to create the visual model of an environment that expresses their symbolic understanding of baboon troop organization.[37]

---

[37]Hanley, et al., op. cit., p. I-7.

Man: A Course of Study and Jerome Bruner are not without critics. In fact, Bruner has been one of the few to put on paper his thoughts about learning and the instruction of young people; therefore, he has been vulnerable to the criticisms of educators. Richard Jones, in his book Fantasy and Feeling in Education, questions the high emphasis on cognitive skills in the MACOS course. A more extensive discussion of Jones' concern is included in Chapter II. In Teaching as a Subversive Activity, Postman and Weingarten faulted Bruner for not coming to grips with the basic question of "what is worth knowing."[38] These authors raise further questions concerning the discussion of what problems students should use their inquiry skills on. In other words, man's humanness as developed in MACOS may not be relevant to the contemporary problems students face.

In this author's view, the MACOS curriculum, as it reflects Bruner's learning theories, requires such fundamental change for some authority oriented teachers and dependent students, that the pre- and in-service training

---

[38]Neil Postman and Charles Weingartner, Teaching as A Subversive Activity, Delacorte Press, New York, 1969, pp. 53-54.

may not be adequate. The training may not be long enough to overcome the previous teaching and learning methods. Indeed, the change could be quite threatening to the security of the teacher and student. In another sense the built-in flexibility of the course lays open the strong possibility that teachers will not change their method or strategies of teaching but merely adjust the content to their previous dogma.

There is evidence (studies reviewed in Chapter II) that MACOS does have a modifying impact on both teachers and students. However, the specific influence hasn't been clearly researched or defined. This study is intended to focus more clearly on the impact of the course on other elementary school subjects. In addition, this study will more closely examine the specific influence of the MACOS strategies in the course itself.

NEED FOR THE STUDY

Researchers have not studied the influence of MACOS on other subjects taught in elementary schools. Indeed, the transfer effects of the course are particularly in need of assessment. This gap in the literature is particularly

significant for several reasons: 1) Some advocates of MACOS allege that the processes underlying the program should underlie the entire elementary curriculum;[39] and 2) MACOS teachers experience such an intensive series of in-service training that it is likely the teaching strategies they employ with the course will transfer to other subjects taught; and 3) The process represented in the course is part of a growing movement in curriculum in general.

Bruner, in discussing transfer of learning, indicates that it is an awareness an individual acquires of his personal thinking process he uses to solve general problems. This awareness, according to Bruner, allows the thinking process to be applied to later problems "earlier learnings renders later performance more efficient."[40] What is important is the development of a consciousness of how and why a particular thinking pattern evolves within a student's mind or how the student perceives his reasoning. In essence, this form of transfer consists of learning a

---

[39] John G. Herlihy, Director, Eastern Regional Institute for Education, Syracuse, New York, 13203.

[40] Jerome S. Bruner, The Process of Education, New York: Random House, 1960, p. 17.

general idea, not a specific skill such as the multiplication tables, and using this generalized idea as a basis for recognizing subsequent problems. For example, a child can be given an object he hasn't seen before and be asked to identify what it is and what it is used for. The child can become conscious of how he is solving the problem by pointing out if he is observing, if he is inquiring or if he is asked how he is thinking about identifying the object. The essential thing here is not that the child identifies the object but how he goes about identifying it. The general process of solving the problem (observing, inquiring, forming possibilities) is what will be retained and applied in other problem situations.

The MACOS course includes strategies and learning experiences that help students and teachers acquire the general ideas Bruner includes in his transfer of learning concept. This study attempts to examine whether these strategies and experiences do indeed transfer to other courses in the elementary curriculum.

The sixth grade teachers and students of Jefferson School in Mason, Michigan, experienced MACOS for the first time during the 1970-71 school year. The uniqueness of the MACOS curriculum and a general evaluation by Dr. Glen

Cooper (Co-director of the MACOS project in Jefferson Elementary School)[41] indicated that the prior curriculum at Jefferson Elementary School bore little resemblance to the MACOS process. In fact, this prior curriculum condition was a necessary prerequisite before the course was encouraged to be adopted. This was further checked by an opinionaire distributed to the teachers (Appendix A). Since the design of the course includes a process that extends beyond the usual school curriculum, specific questions as to the transfer effects of MACOS can be raised.

SPECIFIC PURPOSE OF THE STUDY

The specific purpose of this study was to explore the influence of MACOS upon other areas of the elementary curriculum in sixth grade classes in Jefferson Elementary School, Mason, Michigan. The study centered on the following questions:

---

[41] Dr. Cooper generally surveyed the curriculum in Mason, Michigan, prior to the establishment of the MACOS project. He found little evidence of any innovative programs in Jefferson School in English, science, and especially in social studies. In addition, there was little indication of the "process education," advocated in MACOS, enacted in Jefferson Elementary School, prior to this year.

1. Do the written objectives and teaching procedures in non-MACOS classes reflect a transfer of MACOS principles?

2. Do students recognize the influence of the MACOS process in their non-MACOS classes?

3. Is there a change in written class objectives and procedures with continued exposure to the MACOS process?

4. Is there any difference between the influence of MACOS on English classes than science classes?

5. Is there any difference between teachers and students regarding the influence of MACOS?

6. Do students who experience developmentally the MACOS process recognize more MACOS principles enacted in their non-MACOS classes?

Data gathered has helped clarify what influence MACOS has on non-MACOS classes in Jefferson Elementary School. Further, the data has provided specific information to answer the six questions raised regarding the transfer effects of the MACOS curriculum.

LIMITATIONS

This study was conducted in light of the following limitations:

1. First, a search of the literature revealed little research concerning the transfer effects of MACOS: therefore, this study was exploratory in scope.

2. Second, the population studied included ten 6th grade teachers and their respective students. The school was located in a small mid-western town in Michigan; therefore, the generalizability of the results is limited to similar populations. Sample size included all 10 regular classroom teachers and a random sample of 10 students from each of 2 classes (English and science). Students were heterogeneously grouped by homerooms.

3. Third, another limitation assumed the honesty of teachers and students in their written statements and responses. The instruments used were not designed to ferret out instances of incongruity or contradiction in the data received.

4. Finally, this study did not explore the effects of prior teaching-learning modes in social studies on MACOS. It was assumed that MACOS was a relatively unique learning experience for teachers and students.

HYPOTHESES

The following hypotheses were subjected to non-directional tests to determine the transfer effects of MACOS to other elementary school subjects (English, science). Non-directional tests were used because of the possibility that the MACOS program would have a negative effect on the Jefferson School curriculum. In examining the data in light of a two-way analysis it was felt the transfer effects would be more clearly determined.

H_o1--There seems to be a transfer effect of the MACOS process as reflected in the teacher's written class objectives and procedures, to English and science classes.

H_o2--Students who experience developmentally the MACOS process seem to gradually recognize the MACOS principles enacted in their: 1) English classes, 2) science classes, and 3) MACOS classes.

ASSUMPTIONS

This study was based on the following assumptions:

1. Prior to the study the 6th grade teachers and students of Jefferson Elementary School experienced very little of the "process education" advocated in Man: A Course of Study. Personal contact and observations by a MACOS expert (Dr. Glen Cooper) and data gathered from the Jefferson School staff are assumed to be sufficient evidence of the limited curriculum exposure of the total impact of "process" education.

2. Teacher's written objectives and procedures for their science, English, and MACOS classes will show a relationship to a validated set of MACOS principles.

3. The transfer effect of the MACOS process was identified through: 1) teacher's written objectives and procedures, and 2) student's responses to a specially designed instrument.

4. An instrument was designed that effectively sampled teacher's objectives and procedures in their MACOS and science or English classes.

5. Validated techniques were designed that effectively measured the relationship of: 1) teacher's written objectives and procedures to MACOS principles, and 2) student's recognition of MACOS principles enacted in their classes.

DEFINITION OF TERMS

Several terms require definitions, owing to their specialized use in this study. Special attention was focused on "process," "MACOS process," "transfer," and "transfer effect" since these concepts are of major importance to the study.

PROCESS--(used synonymously with education, learning, curriculum). A pattern of thinking or the promotion of intellectual habits (Bruner) in which the student is encouraged to recognize both the content of the subject and the particular way of approaching it. A broad kind of thinking which is central to any discipline and should engage the child's mind at the earliest possible moment in order to master it (Bruner).[42] Emphasis is placed on acquiring the kind of intellectual discipline that allows one to recognize new problems when they arise and to apply the knowledge

[42]Bruner, op. cit., p. 17.

that has already been acquired to their solution.[43] Involved is a desire and capacity to learn for oneself, to judge for oneself what is worth learning, and to be minimally dependent on the facts and opinions of others.[44] Essentially, it involves taking part in the "acts of learning" or the practice which results in the establishment of knowledge. Important is the way the learner uses his logic, how he follows his hunches and what he considers important.

MACOS PROCESS--Those strategies employed in the program that attempt to operationalize "process" learning. Primarily this involves promoting generalizable behaviors and intellectual proficiency; proficiency in handling, in seeing and imaging, and in symbolic operations.[45]

Operationalizing process learning particularly centers on the materials used in the course. These materials; consisting of films, other visuals, written materials, records, and enactive devices such as simulation

---

[43] Deffenbaugh, et al., op. cit., p. 4.

[44] Ibid., p. 4.

[45] Ibid., p. 5.

games, provide a range of media, styles, and complexities to stimulate and involve children.[46]

As students become involved they are constantly encouraged to try out their own theories in order to become experienced in using alternative models of thought. For example, students watch a film about Eskimo seal hunting. Prior to the viewing the students try to figure out how the Eskimo will organize themselves in order to achieve maximum success. As another example, the students assume the role of the social scientist venturing forth into uncharted and unexplored territory. These examples illustrate how the designers of MACOS intend students to experience the art of getting and using information. In addition, the designers intended stimulating a self-consciousness about thinking. Bruner and Dow (1967) have stated:

> Children should be at least as self-conscious about their strategies of thought as they are about their attempts to commit things to memory.[47]

---

[46] Ibid., p. 6.

[47] Jerome S. Bruner and Peter B. Dow, Man: A Course of Study. A description of an elementary social studies curriculum; Cambridge, Massachusetts: Educational Development Center, 1967.

Bruner and his colleagues have indicated the ideal behaviors and attitudes resulting from exposure to the MACOS process:

1. To give our pupils respect for and confidence in the powers of their own mind.
2. To extend that respect and confidence to their power to think about the human condition, man's plight, and his social life.
3. To provide a set of workable models that make it simpler to analyze the nature of the social world in which we live and the condition in which man finds himself.
4. To impart a sense of respect for the capacities and humanity of man as a species.
5. To leave the student with a sense of the unfinished business of man's evolution.[48]

TRANSFER--According to Bruner: Consists of learning initially not a specific skill but a general idea, which can then be used as a basis for recognizing subsequent problems as special cases of the idea originally mastered. In essence it is the continual broadening and deepening of knowledge in terms of basic and general ideas.[49]

TRANSFER EFFECT--The degree of similarity between a validated list of MACOS principles, and teachers' written

---

[48]Deffenbaugh, et al., op. cit., p. 8.

[49]Bruner, loc. cit.

objectives and procedures for two non-MACOS classes--English and science; and the degree or recognition of the MACOS process that students in non-MACOS classes can recognize, through the use of a specifically designed instrument.

MACOS PRINCIPLES--A list of nine principles and strategies that represent the core of the intentions of the MACOS process.

1. Contrast is a major teaching strategy used to provide a framework for individually discovering and engineering thought. Contrast helps stimulate interest and establish motivation.

2. Multiple activities and experiences are provided as a means to activate and involve the student in the learning process.

3. In the learning environment students should feel free to be spontaneous, willing, and compelled to risk their hunches, intuitive thoughts, or guesses.

4. Logical comparison of ideas and information and affective comparison of feelings are used as major teaching strategies.

5. Classroom dialogue in response to content is flexible on a personal level between pupil and pupil as well as pupil and teacher.

6. Concepts are developed within a unifying set of conceptual, social, and moral themes.

7. Classroom procedures and control are developed cooperatively between teacher and students.

8. Evaluation of student progress and involvement is individualized and personalized by use of small group discussions on reaction to content and student development of projects that reflect an integration of concepts individually assimilated.

9. The teacher is a co-learner with students and helps in exploring open-ended concepts in depth.

NON-MACOS CLASS--All other elementary school classes which do not directly or extensively employ, by name or process, MACOS. Specifically these are English and science classes at Jefferson Elementary School.

OBJECTIVES--A short written statement that describes what a teacher's intentions are regarding what will be taught in a particular subject. For example, one science class objective was stated: Explain to class the balance of centrifugal force and gravity.

PROCEDURES--A short written statement describing how and what activities a teacher will use to meet his objectives. For example, one science class procedure to meet the above objective (sample under objectives) states: Have students draw the earth and explain the balance of gravity and centrifugal force to maintain orbit.

OVERVIEW AND SUMMARY

Man: A Course of Study is an innovative, flexible, social studies course for upper elementary students. Its foundation is process curriculum as conceptualized by Jerome Bruner. MACOS is primarily concerned with helping children become involved in the larger ideas of a discipline (structure) and the acts of learning which are a part of the development of knowledge. The curriculum guidelines for the course are indicated in Toward a Theory of Instruction by Jerome Bruner.[50] In this book he stresses the importance of satisfaction in learning as it emanates from such factors as curiosity, competence, identification, and the need to respond to others (reciprocity). For Bruner these factors are the motivators of learning and are primary in structuring the classroom learning environment rather than around a hierarchical or status-defined roles such as student, teacher, authority. The specific materials and exercises in MACOS are designed to enhance the learning environment as well as activate the motivators of learning. Within the course, the role of the teacher shifts from the

---

[50] Jerome Bruner, Toward a Theory of Instruction, Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1966.

usual transmitter of knowledge to one of arranger of experiences conducive to observing, questioning, and hypothesizing.[51] Teachers adopt a more flexible, open style of teaching and attempt to guide students toward their own personal organization (self-discipline).

Theoretically, MACOS has been well thought out and planned, however, the realities of the theory in practice need further assessment. The rather dramatic change implied of teachers and students may require more training and time than provided for within the course's organization pattern. Some teachers may not be capable of changing their basic teaching style, especially if their security base is founded on controlling students' behavior closely and teaching in a style that is predictable. MACOS curriculum requires considerable spontaneous interaction between teacher and students and the encouragement of unpredictable involvement in the learning concepts. Students under ordinary classroom conditions are dependent on the teacher and materials for direction. Independent thought and spontaneous responses may be too confusing for them to understand or rationally develop. Suggestion of change in classroom

---

[51]Deffenbuagh, et al., loc. cit.

strategies, under ordinary conditions, require support from administration. Teachers and students can better explore new possibilities when those who are in charge are encouraging.

The possible gap between the theory of MACOS and the actual practice, prompted this study. The Jefferson Elementary School staff represents a group of teachers and students who for the most part, practice methods of teaching and learning that depend primarily on order and predictability. In this sense they represent a typical elementary school. What potential influence MACOS has in changing teaching styles and learning behavior of students can be meaningfully examined at Jefferson School.

This study centered on the transfer effects of the MACOS process on other elementary subjects, primarily English and science. Data were gathered, through the use of specific instruments, concerning teacher's written objectives and procedures in English class, science class, and social studies class. Additional data were obtained from a random sample of students, who were asked to indicate whether they recognized MACOS principles enacted in their English, science, and social studies class. The results are reported in Chapter 4.

Chapter 2 of this study reviews the significant research developed from Man: A Course of Study and a review of four interpretative articles written about MACOS.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter reviews the important literature related to Man: A Course of Study. The review is divided into three sections: 1) major research projects on MACOS; 2) interpretive articles on MACOS; and 3) a discussion of literature related to the developmental stages of MACOS.

MAJOR RESEARCH STUDIES ON MAN: A COURSE OF STUDY

There are two major research studies reviewed in this section. Each of the two studies provide evidence of the impact of the MACOS curriculum on some of those teachers and students who have experienced the course.

Curiosity/Competence/Community, An Evaluation of Man: A Course of Study[1]

This is a two volume report (Hanely, Whitla, Moo and Walter) combining a number of studies conducted for the Educational Development Center from 1967-1969. The study was officially published in 1970. In total, these studies reveal penetrating insights into pupil and teacher reaction to the course. An imaginative use of the interview technique and observations were developed by the researchers. These two methods were used as the primary method of collecting data. Relevancy was considered from several perspectives: the psychological needs of inner-city children, modeling behavior, personal competency, and human curiosity, and continuing opportunities for using cognitive skills.[2]

It is sated early in this extensive study that "the course has not been framed within the confines of a behavioral psychology, nor have its developers thought

---

[1] Janet P. Hanley, Dean K. Whitla, Eunice W. Moo, and Arlene S. Walter, Curiosity/Competence/Community: An Evaluation of Man: A Course of Study. Cambridge, Mass.: Educational Development Center, Inc., 1970.

[2] William W. Joyce, "MACOS: A Report from the Inner-City," Social Education, March, 1970.

specifically in behaviorist terms as they prepared and tested lessons, materials, etc."[3] Attention was centered on a theme of learning which gave students a way of considering the effects of learning on their own lives and the importance of learning to the human species.[4] This glogal approach was preferred by the researchers (Hanley, Whitla, Moo, and Walters) even though specific behaviors and lesson plan objectives were possible to research. It was thought that the uniqueness of the course was lost if the research centered on the evaluation of the specific lessons and objectives. Nevertheless, the global nature of the goals were still accessible to research. Indeed the research in this study provokes those working in educational assessment to reach beyond traditional methodology for measuring learning, to more innovative, reflective, and human programs of evaluation.[5]

---

[3] Hanley, et al., op. cit., Vol. I, p. I-9.

[4] Ibid., p. I-10.

[5] Ibid., p. I-10.

Instrumentation

Three evaluation strategies were employed in this study regarding students: the interview, classroom environment checklist, and tests. Essentially the interview was used to determine how intimately children used the materials of the course. The classroom environment checklist helped determine an understanding, in an individual and group sense, of how the users viewed the course materials and the work they did in class. Tests helped judge the consistency with which a core of information was conveyed to groups of students.

The evaluation strategy for teachers was primarily the same as for students. The interview provided a flexible technique to collect data. In addition, classroom observation provided a means of looking at the course-in-action on a day-by-day basis. Further, these observations permitted evaluation of changes in teacher style attributed to the course.

Sample Size and Method of Study[6]

1. Number of classrooms:
   123 classrooms in 16 school systems across the country in both urban and suburban settings.

2. Number of students:
   3003

3. Demographic characteristics:

51% Male	3% Fourth grade
49% Female	54% Fifth grade
	36% Sixth grade
	7% Ungraded

4. Testing of students:
   Pre-post test containing multiple-choice and open-ended items on information, concepts and attitudes. Three student checklists covering involvement and participation, classroom environment, success of various media, personal attitudes and learning styles.

5. Selected student interviews:
   127 students in 19 classrooms. Local students were seen an average of five times.

6. Selected teacher interviews:
   Beginning and end-of-year interviews with teachers in classes where students were also interviewed.

7. Classroom observations:
   109 observations in 29 classrooms taught by 7 men and 18 women.

8. Interviewers and observers in the field:
   7 evaluation staff members; other observations by course developers supervised by evaluation staff.

---

[6] Man: A Course of Study, a pamphlet, Curriculum Development Associates, Inc., Washington, D.C.

9. Teacher evaluations of the course: 70 questionnaires returned from teachers in tested classrooms.

10. Methods of evaluation: Statistical analyses of objective instruments and clinical interpretations of interviews and descriptive materials.

Results

The results of this study are extensive and difficult to report totally due to the global nature of the research. Reported here is a capsule representation of the more essential findings that relate to the "transfer effects."

Student Interviews--Results[7]

1. Students demonstrated in the interviews that they learned a wealth of information.

2. Themes that had special relevance for students included reproduction, nurture, protection of the young and the struggle for survival.

3. A special area that developed involved a model evolving around considering human needs--cooperation, nurturance, protection, sharing of responsibilities.

---

[7]Hanley, et al., op. cit., p. I-23-25.

4. There developed a theme which indicated an increase in students' desire to work without the teacher's direction.

5. Students indicated an awareness of the aesthetics of learning materials--textures, light quality in films, color and illustrations of booklets, type of print, details of format.

6. Students, especially in the suburbs, were impatient with repetition in materials. They wanted to be considered "mature learners."

7. Students became more speculative and reflective about the depth and breadth of the course when they experienced the materials on the Metsilik Eskimo.

8. There appeared to be powerful instructional values involved in the use of ethnographic films. This was true of both suburban and center city students.

9. Center city students indicated more motivation to read MACOS booklets than traditional texts.

Teacher Interviews--Results[8]

1. After working with MACOS for one year, teachers reported new conceptual skills: active listening; communicating; sharing in group exchanges; increased observation skills; and contrasting.

2. Teachers reported a shift from the didactic mode of teaching and learning to the interpersonal mode.

3. Teachers selected as the most salient and exciting characteristics of MACOS:

   a. Diversity of activities and materials

---

[8] Ibid., p. I-43-44.

b. The verbal expressiveness and the respect for others' opinions encouraged by the activities.

c. The power of the films, included in the course, to promote observation skills and motivate students to become involved in a personal way.

4. Teachers felt that the interactive mode of the course helped students of all ability levels to gain confidence in their own thinking and willingness to express ideas.

5. There was more concensus on the positive attributes of the course than the negative. The most common criticisms were that traditional skills were neglected and independent projects were not stressed.

Test Results--Students

Three basic statistical indices were used, in most cases, to report on an extensive pre-post basis. As previously indicated, the sample size was nationwide and the results were compared over a two-year period on a number of different variables (urban, suburban; grade level, IQ, systems, male-female, parent education level). The following are the synthesized results reported by the Curriculum Development Associates:[9]

---

[9] Man: A Course of Study, op. cit., p. 6.

1. Children acquired and retained a significant amount of information and developed an increased ability to reason.
2. Boy-girl differences traditionally associated with school work essentially disappeared in MACOS classes. Boys and girls had a similar reaction to the classroom environment and to learning styles and materials.
3. Among the most remarkable of the findings is that individual differences are not associated with students' intelligence or previous knowledge of the area. Clearly, those students with poor academic background, found so often in the inner city, gained in learning and mastery over the ideas and concepts as much as those whose beginning positions were much stronger. On the other hand, the improvement of these students was not secured at the sacrifice of the most knowledgeable students, for their gains were equally large.
4. The differences that were found among school systems at the beginning of the program tended to be reduced by the end of the course.

Classroom Observation Findings

After extensive observations stressing two focus points, (1) structure and characteristics of lessons; and (2) classroom atmosphere; the following conclusion was indicated:[10]

> The changes observed in classroom activities and overall atmosphere tend to be from a teacher-centered, authority-oriented classroom to a more

[10] Hanley, et al., op. cit., p. V-9.

open, student-and-learning-centered situation. Moreover, the lesson content became less informational and less purely symbolic, more conceptual and enactive. From these data (pre-MACOS and MACOS observations of the same classrooms), we see that curriculum innovation does have an impact on class life, and we can begin to understand the direction of that influence.

An Investigation of Student-Centered Teaching Behaviors in Man: A Course of Study[11]

This study focused on the child-centeredness of MACOS and the problems of developing and using effective instruments to measure it. The teacher's role in the MACOS curriculum was the primary concern. Role expectation was developed from the Eastern Regional Institute for Education's (sponsors of MACOS research) document "Expectancies for Teacher Behavior."[12] Expectations were divided into two dimensions:

1. Performance expectation:
   Teaching strategies shall become increasingly child-centered, non-directive, and dialectical

---

[11] Sue A. Deffenbaugh, Susan M. Dalfen, Richard E. Ripple, An Investigation of an Instrument Battery Related to the Expectancies for Student-Centered Teaching Behaviors in Man: A Course of Study. Dept. of Ed., Cornell University, Ithaca, New York, 1970. Final report Eastern Regional Institute for Education, Syracuse, New York, p. 1.

[12] Ibid., p. 1.

rather than teacher-centered, highly directive, and didactic.

2. Attitudinal expectation:
Teachers shall exhibit positive attitudes toward child-centered, non-directive instruction and shall reject strictly teacher-centered, highly directive, and didactic methods.[13]

After a review of various conceptual definitions of child-centered behaviors, the authors (Deffenbaugh, Dalfen, Ripple) synthesized a concept from McKeachie (1963) as the basis for their study.[14] Modifications were made to accommodate the two expectancies stated in the E.R.I.E. document (see above). Eight instruments were tested to determine which would be useful in measuring degree of child-centered behavior within the classroom.

Each instrument was specifically analyzed for its effectiveness in measuring child-centered behavior in MACOS and non-MACOS classes. A sample of 31 teachers, experienced in the MACOS curriculum were included. Twelve additional social studies teachers who did not teach MACOS were used as the comparison group.

---

[13] Ibid., p. 1.

[14] Ibid., p. 15.

Results

The following comparisons, using these eight instruments (1. Opinionaire, 2. Interview format, 3. Draw a Classroom Test, 4. Dogmatism Scale, 5. Semantic Differential, 6. Flanders System of Interaction Analysis, 7. Ryan's Classroom Observation Record, and 8. Informal Classroom Record and Checklist), of MACOS and non-MACOS teachers revealed that:[15]

1. All instruments except the dogmatism scale proved useful in measuring teachers' child-centered behavior in the classroom.
2. Since no pre-measures were taken, the comparison group could not be considered a valid control group.
3. The measures taken were of prime value in determining the degree to which both groups could respond to the instruments as instruments.
4. The instruments delineated in the study, if used in a carefully designed experiment, seem to constitute a promising battery for assessing the degree to which teachers adopt student-centered behavior and attitude as a result of teaching the MACOS curriculum.

---

[15] Ibid., pp. 77-78.

INTERPRETIVE ARTICLES

With the completion of the developmental stages MACOS has been implemented in a wide variety of educational institutions. Various schools--public and private--colleges, universities, and some international centers throughout the country and in parts of the world are beginning to include MACOS as a part of their curriculum.[16] As the course and its process are widely distributed, the reactive eye of some educators has turned toward examining Man: A Course of Study. These articles are reviewed in order to provide an indication of how some educators are viewing and reacting to MACOS.

It is prudent to indicate here that the following are interpretive articles and have not been developed from extensive empirical research. In no way can they be considered as conclusive evidence of the success or failure of the MACOS project. Most of the information included in these articles have come from brief classroom observations and interpretations of other research (primarily the EDC report).

---

[16] Man: A Course of Study, op. cit., pp. 6-9.

The Bumstead Article[17]

Bumstead reports in his article that MACOS is "a magnificent failure on two counts" and a success on a third. According to Bumstead, the curriculum has failed in transmitting to 10-year-olds such concepts as natural selection, innate and learned behavior, language and communication.[18] Without an understanding of these central concepts the author feels students cannot approach intelligently the central organizing question of MACOS . . . . "What is human about human beings?" The other area of failure indicated by Bumstead is that students didn't seem to develop inquiry skills: defining problems; gathering and classifying data; and forming and testing hypotheses aside from their MACOS class.[19] When there is little evidence of learning in these areas, MACOS cannot claim to have met its cognitive goals, according to Bumstead. MACOS has succeeded in developing a process which enables teachers to abandon the rigid teaching style so often

---

[17] Richard Bumstead, "Man: A Course of Study," Educate, September, 1970, p. 22.

[18] Ibid., p. 22.

[19] Ibid., p. 22.

associated with elementary social studies.[20] This was especially evident in center city schools were teachers generally hesitate to loosen the learning process in fear of losing control.[21] According to Bumstead, teachers exposed to MACOS curriculum tend to adopt a more flexible, open teaching style. They become guides and resource persons to groups of students. A remark by a sixth grade teacher in a center city school illustrates:

> This is my first year teaching this course, she said. I had always been an authoritarian teacher, standing up in front of the class and talking to the students. I like watched myself dissolve. Now, I look from moment to moment for some kid to say, 'I wonder if . . . .' They didn't have much of a chance to say that before.[22]

In pointing out other findings of the EDC report, Bumstead stated that there were impressive results concerning the classroom activities of MACOS classes compared to non-MACOS classes. Indications were that a much wider variety of classroom activities (arts and crafts, open-ended discussion, role play, listening to records, etc.)

---

[20] Ibid., p. 22.

[21] Ibid., p. 24.

[22] Ibid., pp. 25-26.

were evident in the MACOS class compared to a non-MACOS class.[23] As remarked by MACOS evaluators:

> When we began this research, we did not expect to find differences of this order or magnitude between two sets of classes. As our observations progressed, however, it became clearer to the staff that traditional social studies classes possessed a deadening uniformity.

In the Bumstead article there was no specific indication of where he was reporting his results from. Seemingly he has taken selected parts of the EDC report and made some classroom observations for the basis of his article. As a result, the rather strong evaluative criticisms pointed out by Bumstead cannot be considered evidence but more as important questions to be more empirically researched.

The Ferber Article[24]

Ellen Ferber's article seemingly draws its information from observations of various center city and suburban classrooms involved in Man: A Course of Study. It

---

[23] Ibid., p. 26.

[24] Ellen Ferber, "What Makes Humans Human," American Education, May, 1970.

is not clear whether the author actually observed a number of classrooms throughout the country or reacted to the collection of observation data available in the EDC report.

Ferber points out the flexibility of the MACOS curriculum to various settings--geographically, economically, socially.

> Prominently displayed (center-city Washington D.C.) in the classroom is a list the children drew up of some issues with which the course is concerned: the family and other relationships, leaders and protectors, roles of male and females, what makes a good parent, dependency, and group survival in environment. It would be hard to think of a set of issues more closely reflecting the psychological needs of center city children in terms of their own development, identity, and what they choose to become.[25]

After continued discussion evolving around animal adaptation, students in an affluent Boston suburb concluded:

> Although other animals help each other, only man seems to do so with any motivation other than group survival, and only man trains animals of a different species to serve him.[26]

Through observation of these various classrooms, Ferber indicates a seeming success of MACOS to reach several of its main goals:[27]

---

[25] Ibid., p. 2.

[26] Ibid., p. 3.

[27] Ibid., p. 6.

> We seek exercises and materials which show wherein man is distinctive in his adaptation to the world, and wherein there is a discernible continuity between man and his animal forbears (Bruner, 1964)

> To impart an understanding of the capacities of man as a species in contrast to other animals.

> Emphasizing the questions rather than the answer, we help children grasp the sense of knowledge as an unfolding process, an 'unfinished business' in which they must play a part.

According to the author, the students' reaction to the course in general is capsulized by the Washington class when they studied the traditional tales of the Netsilik Eskimo (a rich heritage of history, legend, song, religious belief and rite, fable and myth passed on from generation to generation). "Only man does that," they say--and proudly.[28]

Although the Ferber article points out some interesting reactions of students there is no specific indication of what method she used to obtain her results. However, the implication of her article is that students do seem to find relevant topics to reflect upon. And many

---

[28] Ibid., p. 8.

of the insights reflected seem to align themselves with the goals of the course.

The Hicks Article[29]

Primarily this article indicates the depth of thinking that Man: A Course of Study curriculum encourages from students. "It's the intellectual's dream for his own child" (Dr. Bruce R. Joyce of Teachers College of Columbia University).

An example was pointed out where a class in Pierce School in Newton, Mass., was discussing the instinctive and learned behavior of a salmon when the discussion turned to humans. One pupil asked: "Which category does crying fit into, instinctive behavior or learned behavior?"

In-depth thinking is one of the intended goals of the MACOS curriculum. General indications seem to show that students do indeed begin to think in a fashion not usually expected of 10-year olds. However, the evidence thus far has been subjective and no specific means have been designed to define or measure what in-depth thinking really is.

[29] Nancy Hicks, "10-Year-Olds Encouraged to Think Big," The New York Times, November 16, 1969.

The Joyce Article[30]

Under the guise of Operation REFUEL (Relevant Experiences for Urban Educational Leaders) William W. Joyce, Professor of Education, Michigan State University, worked with part of the fifth and sixth grade staff and students of the Allen Street School in Lansing, Michigan. Allen Street School is a center-city school with a population of 22% black, 19% Mexican-American, and 59% white. Joyce's efforts were centered on the question "Is MACOS succeeding at Allen Street?"

With the consent of the MACOS directors, the Allen Street staff was involved with the second half of the MACOS program. Essentially the latter half involves the study of the Netsilik Eskimo materials. These materials were selected on the assumption that they would be more relevant to the concerns of sixth graders than other materials of the course.[31] In addition, the most salient characteristic of the sixth graders involved was their diversity--they differed widely in needs, values, aspirations; and came

---

[30] William W. Joyce, "MACOS: A Report from the Inner-City," Social Education, March, 1970.

[31] Ibid., p. 8.

from a wide variety of social, economic, and ethnic backgrounds.[32]

Despite the limited (two months) experiences with MACOS the pupils and teachers formed some definite impressions of the Netsilik unit.[33]

1. The lack of specific, clearly defined objectives was disturbing to the instructional team and pupils.
2. Pupils expressed a growing awareness of the behavior models depicted in the Netsilik unit--particularly those involving cooperation, nurturance, sharing of responsibility, and resourcefulness--but they did not appear to be internalizing and reflecting upon these as concepts to be refined and extended.
3. Increasingly, many of the children sought greater independence and freedom of action in the classroom.
4. Students continued to be relatively unresponsive to the aesthetics of written materials included in the Netsilik unit. Films were a notable exception.
5. Pre- and post-tests of vocabulary competence revealed that pupils showed a 20-70 percent gain in achievement, with the poorest readers registering the highest initial gains.
6. Students began to see the value of using inferential or conceptual skills promoted by the course.
7. Games included in the unit excited and involved the students. Both boys and girls were equally proficient in playing.

---

[32] Ibid., p. 6.

[33] Ibid., p. 8.

8. It was indicated that students tended to continue discussion of the Netsilik Eskimo with parents after school hours in a number of cases.

9. Teachers became more aware of the advantages of the flexible format of the course--students could better pace themselves.

10. Pupils tended to be frightened and emotional in response to the killing scenes included in the Netsilik films. This entailed the killing of a caribou and seals, by the Eskimos, in two scenes of the nine films included in the unit.

11. As a result of the unit, additional concerns developed on the part of the students: consequences of mercury contamination; and arctic oil explorations as related to life style of Netsilik Eskimo.

12. The critical role of the teacher was underscored. In accordance with MACOS designers, much time is usually spent helping teachers develop what is often a foreign role for teachers--defining individualized tasks, guiding students toward inquiry, and maintenance of an open classroom climate. The specialized training usually included in the pre- and in-service training session of MACOS teachers better assures success in reaching the goals of the course.

The results of the Joyce article certainly lend some insight to the effectiveness of the MACOS curriculum on the inner-city school. However, it is necessary to point out that the reported results of his experience are tempered by the conditions in which the course was enacted. First, there was very little in-service training for teachers prior to their involvement in the MACOS classes.

MACOS, because it involves such extensive affective skills, requires intensive as well as extensive pre- and in-service training. It is doubtful whether the staff involved in MACOS at the Allen Street School had enough time for extensive in-service training. Second, the MACOS curriculum is established on a sequential relationship between the concepts of the first half of the course (contrast with animals) and those of the second half (Netsilik Eskimo). It raises doubts whether the course can be begun with the Netsilik materials because of the necessary build up in concepts needed from the first half of the course.

MACOS--OVER-EMPHASIS ON COGNITIVE SKILLS? A DISCUSSION

Richard Jones was an important critic during the early developmental stages of Man: A Course of Study. His concerns centered around not excluding the emotional and imaginal stages involved in the learning process of children. Jones indicated that Bruner's theories, as developed in MACOS, placed too much emphasis on cognitive skills.

In his book Fantasy and Feeling in Education[34] he wrote regarding MACOS:

> A comprehensive theory of instruction should seek to prescribe not only optimal levels of intellectual uncertainty, risk and relevance but also optimal levels of emotional involvement and personal curiosity. Pose the purely cognitive challenge to a fifth grade child of speculating on the absence of social fatherhood among baboons and he is likely to be led to levels of uncertainty, risk and relevance that are either too high or too low to support his best thoughts . . . . But find a way to engage his heart in the problem and you are likely to see the child rise naturally to his own optimal levels of uncertainty, risk and relevance.[35]

It is important to note that Jones' concern for the overemphasis of the cognitive domain, was reflected from his early classroom observations of the developmental stages of MACOS. His insights were well founded and presented a valuable caution to the development of Man: A Course of Study. Unfortunately he did not observe the final version of the course to examine again his previous concerns.

---

[34]Richard M. Jones, Fantasy and Feeling in Education, Harper & Row, New York, 1968.

[35]Ibid., p. 125.

Out of his experience with MACOS, Richard Jones acknowledged that without the curriculum, without the organized "rational" basis of the course, it would not be possible to come to some understanding of human behavior, which he found children could reach.[36] Further, he indicated the critical role of the teacher in supporting the explorations of feelings, and in going beyond expressions only, to relating the personal to the general framework of the materials.[37]

The developers of MACOS as well as the EDC study emphasized exploring the degree of inclusion of emotions and feelings in the process and materials of Man: A Course of Study. The interviews included in the EDC report indicated clearly the emotional relevance of the course and the diverse ways children respond to its emotional components.

SUMMARY AND CONCLUSIONS

Man: A Course of Study is relatively unprecedented in the amount of research money directed toward such a new

---

[36] Hanley, et al., op. cit., p. I-19.

[37] Ibid., Vol. I, p. I-19-20.

course of study. In addition, the unique process of the course has caught the critical eye of many educators as well as those outside the field.

How successful is MACOS? This question has been creatively and extensively examined in a major research project conducted for the Educational Development Center (1967-69).[38] Further, several articles have been written about MACOS--four have been reviewed in this chapter.

The findings of the EDC report are not conclusive due to the global nature of the research. Much of the results cited in the study are subjective, based on interpretations of student and teacher interviews. However, the major goals of the course (listed on page 62) were carefully examined through the use of these extensive diagnostic interviews (teachers and students previously involved in the course), observations of classrooms, and various tests on the content of the course.

Major Goals of the Course

1. To initiate and develop in youngsters a process of question-posing (the inquiry method).

---

[38] Ibid.

2. To teach a research methodology where children can:
   a. look for information to answer questions they have raised
   b. use the framework developed in the course (e.g. the concept of the life cycle) and apply it to new areas.
3. To help youngsters to develop the ability to use a variety of first-hand sources as evidence from which to develop hypotheses and draw conclusions.
4. To conduct classroom discussions in which youngsters learn to listen to others as well as to express their own views.
5. To legitimize the search; that is, to give sanction and support to open-ended discussions where definitive answers to many questions are to be found.
6. To encourage children to reflect on their own experiences.
7. To create a new role for the teacher, in which the teacher becomes a resource to children, rather than only an authority.[39]

The above goals indicate the unusual theme of learning involved in the course. Due to this unusual theme the researchers (EDC, Cambridge, Mass.) chose[40] to conduct their evaluation in a global fashion thinking it would reveal more clearly the uniqueness of MACOS.

The findings of the EDC study suggest that a great many of the fundamental ideas underlying the course (inquiry,

---

[39] Ibid., Vol. I, p. I-5-6.

[40] Ibid., p. 10-11.

child centeredness, depth of thinking, high interaction, multi-media, relevancy) were reflected in the results.[41]

The Cornell Study (Deffenbaugh, et al.) substantiated the child-centeredness of the MACOS teacher and developed a set of instruments (MACOS opinionaire, Interview format, Draw a Classroom Test, Dogmatism Scale, Semantic Differential, Flanders System of Interaction Analysis, Ryan's Classroom Observation Record, Informal Classroom Record and Checklist) to measure it. All instruments except the dogmatism scale indicated MACOS teachers did reflect varying degrees of student-centered behavior.

Several interpretive articles have been written concerning the success and uniqueness of MACOS. Basically most authors (Joyce, Bumstead, Ferber, Hicks, Sanders and Tanck, Grannis) used the EDC report, in varying degrees, as the source of information for interpretations. There seems to be agreement reflected among the authors that MACOS helps change teacher behavior from one of authority centered to one that is more child centered. As Joyce, Bumstead, and Ferber indicated:

> Teachers exposed to MACOS curriculum tend to adopt a more flexible, open teaching

---

[41] MACOS pamphlet, op. cit.

> style. They (teachers) become guides and resource persons to groups of students.[42]

In addition, there was strong indication (Bumstead, Ferber, Joyce) that the MACOS curriculum is flexible in that a variety of media (multimedia) and learning strategies are included which stimulated students to become relevantly involved. MACOS classes that were compared to non-MACOS (Bumstead, p. 26) showed a considerable difference in the variety and number of activities included in the learning strategies. Students become much more open and willing to pursue their hunches, guesses, and general logic (Joyce, Bumstead, Ferber). They choose to interact with others in checking and developing their patterns of thought (Joyce). Further, students have a chance to "think big" (Hicks) about the nature of man. Often this type thinking is beyond what is usually expected of 10-year-olds (Hicks, Ferber). As indicated in the EDC study, students generally showed a significant gain in achievement comparing pre-tests on MACOS concepts (adaptation, dependency, parenthood, social relationships, life cycle). Joyce found significant gains (20-70 percent) in achievement in vocabulary of the Allen Street School sixth

---

[42] Bumstead, loc. cit.

graders.[43] Though there is much cognitive material in the MACOS course, the affective domain emphasized in the process approach is considerable.

Richard Jones, a psychologist and a critic in the developmental stages of MACOS, criticized the Brunarian framework of the course.[44] He indicated MACOS was too cognitively oriented and lacked emphasis on the emotional and imiginal stages in the learning process. Jones' concerns were directed toward the early development of the course and not of the final product. The EDC report presents considerable evidence that those who have used the course do indeed spend considerable effort with developing and exploring childrens' feelings.[45]

Recapitulation

Much of the research and reaction to Man: A Course of Study has not been on an empirical basis and has not empirically assessed the central process of the course. Perhaps the complexity of the process curriculum implied

---

[43] Joyce, loc. cit.

[44] Jones, loc. cit.

[45] Hanley, et al., op. cit., p. I-20.

in the program makes it difficult to assess. Authors discussed in this chapter (Joyce, Bumstead, Ferber, Hicks) have not been able to establish conclusive evidence for their findings regarding MACOS. The most extensive evidence has been established in the Cornell Study (Deffenbaugh, et al.) where the degree of child-centered behavior of MACOS teachers was evaluated by use of specific instruments. The core of the course, process curriculum, has not been empirically assessed, nor has the transfer effect. Regardless of the abstract quality of the MACOS curriculum there needs to be a more extensive attempt to evaluate it.

The thrust of this study has been to assess the transfer effect. The abstract dimensions of the course process were synthesized into the nine MACOS principles and then empirically applied to the written objectives of teachers and the recorded responses of the students.

Summary.--It appears evident from the literature reviewed in this chapter that MACOS is unique and does indeed reflect success in changing the classroom environment from a teacher centered to a more cooperative student centered community. Strong and extensive subjective evidence (EDC report) gathered by use of the interview technique, does reflect impressive insights into the affective

impact of the course. The multi-media approach seems to facilitate the development of the process education implied in Man: A Course of Study. Further, EDC researchers indicate that the process of MACOS encourages children to explore and develop their own rationale for understanding the "why" of human behavior.

There has been little attempt to empirically examine the impact of the process orientation central to the course and whether the process, or parts of it, transfer to other more traditional courses. This study is designed to validate empirically the transfer effects of the MACOS process to other subjects. The specific method of evaluating the transfer effects is developed in Chapter III.

CHAPTER III

DESIGN OF THE STUDY

This study consisted of four stages:

Stage I, Selection of Sample.--The sixth grade teachers and students in the Jefferson Elementary School, Mason, Michigan, were used as the sample because Man: A Course of Study was included in the curriculum for the first time.

Stage II, Development of Instruments.--Four instruments were designed (Appendix A): 1) List of Nine MACOS Principles, 2) Objective-Procedure Diary, 3) Questionnaire for Students, and 4) Teacher Opinionaire. These instruments were used to facilitate data generation.

Stage III, Data Collection.--The instruments described above were used to collect data to ascertain the transfer effects of MACOS to English and science classes.

Stage IV, Treatment of Data.--Data collected were subjected to a two-way analysis variance to examine possible trends of the process involved in MACOS and other subjects.

Each stage sought to facilitate the analysis of the MACOS Social Studies Program in respect to evidence of tendencies of the transfer-effects to non-MACOS classes.

STAGE I--SELECTION OF SAMPLE

The sample for this study was determined in the first week in October, 1970. Man: A Course of Study was in its initial stage of being included in the Jefferson Elementary School curriculum. This was one of the first elementary schools within the state of Michigan to adopt such an innovative program.

Population

The entire population of this study was centered in Jefferson Elementary School, Mason, Michigan. This school is a building housing all sixth grade classes in the school system. Students in Jefferson School were grouped into 10 heterogeneous homerooms with an average of 28.3 students per homeroom at the time of this study. Ten regular teachers, two special teachers (physical education, art, music) and 283 students made up the total

population of the school. Each teacher taught MACOS social studies to their homeroom and English or science to another group. Five teachers taught English and five science in a back to back exchange schedule.

Sample

The entire staff of ten regular 6th grade teachers and a random sample of ten students from each of two classes, MACOS and English or science, was used.

Teacher N = Ten
Student N = Two hundred

STAGE II--DEVELOPMENT OF INSTRUMENTS

Between October 1, and November 1, three instruments were developed and checked for general reliability and validity. The simplicity of the instruments enhanced their use and accuracy.

First Instrument, MACOS Principles

A list of ten MACOS principles, representing a core of the MACOS curriculum strategies, was synthesized from

specific literature[1] evaluating and describing the intentions of the MACOS program. In order to help establish content validity, consultant help was solicited from MACOS experts. Dr. John Herlihy, Director of the Eastern Regional Institute for Education and his associates agreed to help. Dr. Herlihy and his associates have been intimately involved with the development and evaluation of the MACOS curriculum and its diffusion in various schools throughout the country over the last six years. The ten principles were given to four MACOS experts at E.R.I.E. for a validation judgment. A 1-3 rating process was used. Each of the four experts was given a list of ten principles of the MACOS strategies (Appendix B). They were asked to rate them according to the following:

> If the statement is a clear representation of a MACOS principle, place a number 1 in the blank space.
>
> If the statement is a good representation of MACOS but should be reworded place a number 2 in the blank space preceding it. (If rewriting is necessary please feel free to make the corrections in the space below the statement.)
>
> If the statement is not a representation of a MACOS principle place a number 3 in the blank space.

---

[1] Hanley, et al., op. cit.; Deffenbaugh, et al., op. cit.; Bruner and Dow, op. cit. In addition, teacher guides incorporated in the course.

The responses of the four judges were tallied. Each item receiving all 1's was accepted. Each item that had at least one 2 was rewritten according to the combined suggestion of the judges. Any item receiving two or more 3's was deleted. After corrections were made as to form and agreement of the written MACOS principle they were resubmitted for a final judgment. The completed list included 9 principles and is found in Appendix A.

This process established the content validity and reliability of the first instrument.

Second Instrument, Student Questionnaire

A sixteen item questionnaire for students was developed from the ten validated MACOS principles and from two research projects.[2] The responses to each item fell within a 1-5 range as indicated in the sample below. For the purposes of this study the lower the mean the greater the similarity to the MACOS principles. Face validity was established since the questions reflected the content of the MACOS principles. For example, one of the MACOS

[2] Hanley, et al., op. cit. and Deffenbaugh, et al., op. cit.

principles states: "Multiple activities and experiences are provided as a means to activate and involve the student in the learning process."

Two items on the student questionnaire that relate to this principle are:

Students see and use many things (magazines, films, booklets, records, etc.) to help them think about what they are studying.

_____1. always true
_____2. true most of the time
_____3. true about half of the time
_____4. seldom true
_____5. not true

The teacher gives students the chance to find many ways of thinking about a problem.

_____1. always true
_____2. true most of the time
_____3. true about half of the time
_____4. seldom true
_____5. not true

A trial run of the instrument was conducted using a 5th grade classroom in one of the local elementary schools in Okemos, Michigan. The students were asked to read the questions and generally apply them to their classroom. Each question was then discussed in terms of clarity and understanding of how to apply it to the classroom. The majority of the students seemed to understand the questions and could make a general application to their current classroom.

Prior to the trial run a brief description of the teacher's teaching style was obtained from the school principal. Primarily he indicated that the teacher had been teaching for approximately twenty years and was most concerned with helping students understand the content of the materials she taught. Her classroom attitude was generally firm and he described her as a "subject oriented teacher" rather than a "child-centered" teacher.

The general description of the teacher and the results of the trial run indicated some relationship. The sixteen item questionnaire includes items which could be generalized to reflecting the degree of freedom students feel in the classroom. MACOS strategies are partially built upon a child-centered point of view.[3] Several items (1, 3, 5, 6, 10, 11, and 16) on the questionnaire were included to indicate, among other things, the extent of child-centered concepts as perceived by the student. The teacher in the trial run had a mean of 3.85 per item on these questions. This does not indicate the teacher is not child-centered but does seem to show that the students' responses are rather consistent in indicating their perception of activities. These activities could be an

[3]Deffenbaugh, et al., op. cit., p. 2.

indicator of child-centered activities. It is interesting to note that the principal's description of the teacher as "subject oriented" is somewhat related with the students' perception of activities. This is an indicator that the instrument is reasonably reliable.

Third Instrument, Objectives-Procedures Diary

A brief form (Appendix A) to uniformly sample a teacher's classroom objectives and procedures for a specific week and subject was developed. Experienced teachers reacted to the form for clarity and understanding. The simplicity of the instrument facilitated its reliability and validity. In addition, the method of administrating its use assured the collection of reliable data.

Fourth Instrument, Teacher Opinionaire

A MACOS opinionaire was previously developed and recommended for use in evaluating the impact of Man: A Course of Study.[4] This opinionaire (Appendix A) was

[4]Deffenbaugh, et al., op. cit., p. 76.

somewhat modified in order to apply to this study. Basically, its purpose was to collect data that would generally indicate the impact of MACOS as perceived by the teachers who have experienced the course.

STAGE III--METHOD OF DATA COLLECTION[v]

Data were gathered two times during the 1970-71 school year at Jefferson Elementary School. The first time was during the week of November 2-6. This time was chosen because the teachers and students at that time had been sufficiently indoctrinated with the MACOS curriculum. There had been a number of pre- and in-service workshops and the materials used in the course had been distributed. In general, the program had settled into a normal routine for both teachers and students. There had been sufficient time for the "newness" effect to wear off therefore assuring a good sampling of data.

There was a six-month interval between the first and second data collection. The second set of data was gathered during the week of May 3-7, 1971. This week was chosen to assure a good representation of data. It was approximately six weeks prior to the end of the school

year; therefore, the curriculum was in full session. It was early enough that the end-of-the-year anticipation by the teachers and students probably hadn't affected the normal operation of the curriculum.

Each of the two times data was collected from both students and teachers.

Data Collection--Teachers

The Objective-Procedure Diary was given to the ten 6th grade teachers at Jefferson School on Monday the week of November 2nd. Prior to giving the form to the teachers the experimenter explained its use to each teacher individually as well as collectively. It was made clear that the form should represent what actually took place in their classes regarding the week's major objectives and procedures or activities. It was pointed out that the information could be written on a daily basis to assure what actually took place rather than what was intended. In addition, a sample form was included to help teachers keep in mind the nature of their task.

The ten sixth grade teachers wrote their class objectives and procedures for one week in November (2-6)

and one week in May (3-7). This was done in each of ten MACOS classes and in five English classes and five science classes. The schedule at Jefferson School required each teacher to teach MACOS, Math and/or English, science. Five teachers taught English and five taught science. Teachers were paired and exchanged classes, back to back, in order to schedule English and science for all classes.

Data Collection--Students

During each of the two times that teachers wrote out their class objectives and procedures a random sample of ten students, from each of two classes (MACOS and/or English, science), were given the sixteen item questionnaire.

Students were taken from their particular class (MACOS, English, science) at the time the subject was being taught. To assure minimum disruption and cooperation, teachers were agreeable prior to asking the students to leave the class. This seemed to help students be more relaxed and more easily apply the statements in the instrument to the class. Care was taken to establish rapport with the students as well as an informal setting prior to

their responding to the questionnaire. Students were told that their opinion was needed concerning what they thought was happening in their classrooms. In addition, it was mentioned that their teachers wanted them to honestly react. Their name was not included on the questionnaire to assure a more candid reaction.

After the students were relatively comfortable with the experimenter (responding freely, smiling, laughing, etc.) and understood the nature of their task, the questionnaire was given to them. Since the students had a choice in responding on a 1-5 scale (1. always true to 5. not true) each of the five choices was clearly explained according to the following directions:

> I will ask you to think about some of the activities of this class. There are a few statements followed by a number. This is what each number means:
>
> 1 The statement describes this class very well. The statement about the class is always true.
>
> 2 The statement describes this class most of the time but not all of the time.
>
> 3. The statement describes this class about half of the time.
>
> 4. The statement describes the class only occasionally. It is not often true.
>
> 5. The statement does not describe this class.
>
> Read each of the statements. Opposite the statement, circle the number that best describes this

> class. If you do not understand the directions, or some of the words in the statement, or the whole statement please raise your hand and I will help you.

In addition, examples were given in order to practice applying the scale.

In order to assure applying the questionnaire in the framework of the MACOS principles each question was read aloud and when necessary an example was given. This was done because some questions could have been generally misapplied. For example, one statement read: In this class students learn how to ask questions which need to be talked about for a long time. Students were told that "questions talked about for a long time" meant that the question didn't necessarily have a single answer but would have to be talked about. An example was used; What if the earth had two suns or we as people had twenty fingers. What would happen in these cases? These type examples were needed in order to frame the statement; in this particular case framing the intuitive, question-posing mode of the MACOS process.

Groups of ten students from all MACOS classes and English or science classes applied the same questionnaire to these three subjects in the curriculum. The total

included 200 students for each of the two times the instrument was administered.

Data Collection--General

A Teacher Opinionaire was given to each teacher the week of May 3rd, 1971. The data gathered helped indicate the general impact of Man: A Course of Study on the teachers and their students as perceived by the teacher. In addition, the opinionaire established the relationship of some independent variables to the dependent variable (set of nine MACOS principles). The results of the Teacher Opinionaire are reported in Chapter IV.

STAGE IV--TREATMENT OF DATA

Each of the ten teachers' class objectives and procedures for MACOS and/or English, science classes were compared to the validated list of MACOS principles by two trained raters. The strength of the list of principles was the dependent variable. A set of the class objectives and procedures was submitted to the raters twice during the 1970-71 school year for comparisons to the MACOS principles.

The raters used were two experienced elementary teachers who are presently involved with curriculum projects and graduate studies at Michigan State University. Their teaching experience and present studies in curriculum facilitated their ability to act as raters in this study.

The training of the two raters consisted of the experimenter meeting with them several times over a two-month period to familiarize them with the MACOS curriculum prior to their rating task. The raters were thoroughly informed of the strategies of the MACOS curriculum by use of the following: 1) experimenter's explanation, 2) films used in the MACOS curriculum, 3) a tape recording by Jerome Bruner explaining the background and development of the course, 4) literature giving an overview of the course, and 5) an explanation of each of the nine MACOS principles.

A second part of the rater training consisted of practice ratings. Each rater was given periodically a sample of an objective-procedure diary (Appendix B) to practice independently comparing them to the list of MACOS principles. Their scores were compared to the experimenter's scores. The differences were discussed after

each sample in order to syncronize the raters' judgments with that of the experimenter. When the two raters and the experimenters were making similar judgments, a final set of sample objective-procedure sheets were administered independently to each rater. An 89% agreement was established so there was no significant difference between the decisions reached by the two raters and the experimenter.

After the training was complete the two raters independently judged the teachers' objectives and procedures for their MACOS and/or English, science classes. The ratings were determined by looking at each statement on the teacher's class objectives, the activities used to meet the objectives and the amount of time spent on each activity. On each sheet of a teacher objectives/procedures there were two rating boxes--one for the objectives and one for the procedures (Appendix B).

	1	2	3	4	5	6	7	8	9
related to principles									
degree of relationship									

Each Rater checked which principles an objective or procedure related to and to what degree. The following scale was used to determine the degree of relationship:

1) no relationship, 2) weak relationship, 3) fair relationship, 4) good relationship, and 5) strong relationship.

Each rater scored a total of twenty objective-procedure sheets, ten for the MACOS classes and ten from the English and/or science classes. The differences in scores between the raters were averaged and a single set of scores was obtained for each of two ratings (week of November 2 and week of May 3).

Scores obtained from the two raters and the scores of the student questionnaire were each analyzed for significant differences using non-directional hypothesis.

Statistical computations were conducted in three forms.

Correlation

Correlations were computed to see if there is a significant relationship between the raters' scores of teacher objectives-procedures in MACOS and English/science classes. In addition, correlations were computed to potentially indicate if there is a relationship between the students' perception of MACOS and their English and science classes. In each case correlations were computed for

time 1 and time 2 to see if there was any difference. The Pearson product moment formula was used as the basic correlation formula.[5]

t-Tests

t-Tests[6] were computed to indicate if there was a significant difference between the raters' judgments and the students' perceptions between time 1 and time 2.

A Two-Way Analysis of Variance

A two-way analysis of variance was computed to indicate if there is an interaction effect between the subjects of English and science between time 1 and time 2. This was done for the judges' ratings between times 1 and 2 as well as for the students' perceptions between times 1 and 2. The basic computational form used is found in the book Fundamental Research Statistics by John T. Roscoe on page 249.[7]

---

[5]Allen L. Edwards, Statistical Analysis, Holt, Rinehart and Winston, New York, 1958, p. 185.

[6]John T. Roscoe, Fundamental Research Statistics, Holt, Rinehart and Winston, Inc., New York, 1969.

[7]Ibid.

SUMMARY

This chapter developed and described the method of ascertaining the transfer effects of the MACOS process to English and science classes. In addition, the degree of recognition of the MACOS process in MACOS classes themselves was examined. An instrument was developed to obtain a sample of each teacher's written objectives and procedures in their English, science, and MACOS classes. Two trained Raters rated each set of objectives and procedures. This was done in early November and in early May. The scores obtained were subjected to a two-way analysis of variance. A student questionnaire was developed and used to see to what degree students recognized the MACOS principles enacted in their MACOS, English and science classes. Scores were obtained two times, once in early November and once in early May. Again the scores were subjected to a two-way analysis of variance. The results of these procedures are reported in the next chapter.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The findings of this study are reported in this chapter. Data collected relevant to the experimental hypotheses are analyzed and the results indicated. These data were analyzed in relation to three statistical methods: correlation, t-test, and a two-way analysis of variance.

Also reported are the summarized results of a Teacher Opinionaire concerning the subjective impact of the MACOS course.

Mean Scores--MACOS

Table 4.1 reports the mean scores of the teachers' Objectives-Procedures in MACOS classes as judged by the Raters for times 1 and 2. This table (4.1) also reports the students' mean response scores on the questionnaire for MACOS classes time 1 and time 2.

TABLE 4.1.--Mean scores of Raters of teachers' written objectives-procedures and students' recorded responses for time 1 and time 2, in MACOS classes.

	Time 1	Time 2
Raters' Judgments	51.65	48.10
Students' Responses	48.06	46.73

Theoretically, the maximum positive mean that was possible for teachers to receive from the Raters was 90. There were eighteen possible ratings on a 1-5 scale with 1 being the lowest and 5 representing the highest. The nature of the MACOS curriculum as represented by the list of Nine MACOS Principles made the maximum mean of 90 almost impossible to obtain. Apparently at no time during a given week could all the strategies implied in the nine principles be enacted or incorporated into the written objectives procedures of the teacher's class.

The maximum positive mean for student responses to the questionnaire was 16. In this case the 1-5 scale was established with the highest value on 1 and the lowest on 5. This scale was the numerical reverse of the one applied to the teachers' objectives/procedures by the Raters.

The actual mean scores for both teachers and students as established by the respective methods leads one to believe that MACOS principles are operating in the MACOS classes in theory. The teachers' rated scores and the students' response scores were obtained by two independent methods.

ANALYSIS OF DATA RELATED TO HYPOTHESIS ONE

Hypothesis 1.--There seems to be a transfer effect of the MACOS process as reflected in the teachers' written class objectives/procedures, to English and science classes.

Symbolically: $H_o: TME_{t_1} = TME_{t_2}$

$H_o: TMS_{t_1} = TMS_{t_2}$

Legend: TME_{t_1} = Teachers' total rated mean scores for English classes, time one.

TMS_{t_2} = Teachers' total rated mean scores for science classes, time one.

The data gathered were first analyzed using the Pearson Product Moment correlation formula.[1] This was

---

[1]Allen L. Edwards, Statistical Analysis, Holt, Rinehart and Winston, New York, 1958, p. 185.

done to determine if there is a statistically significant relationship between the Raters' judgments of the teachers' written objectives/procedures in English/science classes and the MACOS classes. Data gathered from the students were also analyzed using the same correlation formula to indicate if there is a significant relationship between English/science classes and MACOS classes. The results of the correlations are reported in Table 4.2, below.

TABLE 4.2.--Correlations between Raters' judgments of teachers' objectives/procedures in English and science classes and the MACOS classes, times 1 and 2.

	MACOS	English	Science
	Time 1--Raters' Judgments		
MACOS	1.000		
English	.387	1.000	
Science	.009	- .184	1.000
	Time 2--Raters' Judgments		
MACOS	1.000		
English	.364	1.000	
Science	.595	.782	1.000

As judged by the Raters there appear to be no significant statistical correlations between the teachers' objectives/procedures in English, science classes and the MACOS classes for time 1.

Correlations for time 2 indicated that there was a moderate statistically significant correlation (.59) between MACOS and science classes. Teachers' written objectives/procedures for science and MACOS classes showed some similarity when both sets of objectives/procedures were judged by the Raters against the Nine MACOS Principles. The correlation (.59) would possibly indicate some degree of transfer effect as reflected in the similarity of teachers' written objectives/procedures. The possibility is further supported when the correlation for MACOS/science, time 1 (.009) is contrasted with the correlation for time 2 (.59).

The high correlation (.78) between English and science for time 2 indicated a similarity in scores but not in possible transfer effect. The average score recorded for English class objectives/procedures was 27.5 and for science class 30.7. These scores are relatively low (maximum = 90) and the correlated results are those of similarity in low scores.

Correlations in no way imply causation therefore inferential tests of differences between content areas were performed. The initial question to be answered was: Do the rated scores for teachers regarding the MACOS classes change over time?

This question was responded to by the Raters' scores in terms of their judgments of teachers' written objectives/procedures in MACOS classes. A t-test was applied to see if there was a statistically significant change over time in the MACOS classes as revealed by the Raters' scores. The results of this inquiry are found in Table 4.3, below.

TABLE 4.3.--t-test[2] for time one, time two. Raters' $\bar{x}$ scores of teacher objectives/procedures, MACOS classes.

	Time 1	Time 2	t
Mean	51.65	48.10	.85
		Not Significant	

It can be inferred that there is no significant difference in perception of the Raters' judgment over time

[2] Ibid., p. 185.

regarding teachers' written objectives/procedures in MACOS classes.

The next question to be answered is: Do the rated scores for teachers in English and science classes differ over time?

A two-way analysis of variance[3] was performed to determine if there was a significant difference between times. The results regarding the Raters' judgments for English/science classes are found in Table 4.4, below.

TABLE 4.4.--Two-way analysis, English/science--Teachers.

Analysis of Variance Raters' Judgments				
Source	df	ss	ms	f
Time	1	195.31	195.31	1.69
Subject Area	1	13.61	13.61	.12
Interaction	1	12.02	12.02	.10
Within	16	1844.80	115.30	
Total	19			
		Not Significant		

There were no statistically significant differences for either time, subject, or interaction.

[3] Loc. cit.

ANALYSIS OF DATA RELATED TO

HYPOTHESIS TWO

Hypothesis 2.--Students who experience developmentally the MACOS process seem to gradually recognize the MACOS principles enacted in their: 1) English classes; 2) science classes; and 3) MACOS classes.

Symbolically: H_o: $SME_{t_1} = SME_{t_2}$

$SMS_{t_1} = SMS_{t_2}$

Legend: SME_{t_1} = Students' mean scores for English classes, time one

SMS_{t_1} = Students' mean scores for science classes, time one

The data gathered were first analyzed using the Pearson Product Moment correlation formula. This was done to determine if there was a statistically significant relationship between students' mean responses in English/science classes and their responses in MACOS classes. The results of the correlations are reported in the following table, Table 4.5.

The students' responses in their English and science classes revealed two significant correlations (-.87 and .95) for time 1. A correlation of -.87 between MACOS and English classes indicates rather strongly that as students perceived more of the MACOS principles in MACOS

TABLE 4.5.--Correlations between students' responses in English/science classes and MACOS classes for time 1 and time 2.

	MACOS	English	Science
	Time 1, Students		
MACOS	1.000		
English	-.870	1.000	
Science	.957	.256	1.000
	Time 2, Students		
MACOS	1.000		
English	-.500	1.000	
Science	-.150	-.915	1.000

classes, their perception of the same MACOS principles in English class was proportionally less. In view of this score (-.87) there appears to be little possibility of a transfer effect of MACOS principles as perceived by students to their English classes for time 1.

A correlation of .96 was obtained between MACOS and science class for time 1. It is evident from this score (.96) that students, in the early part of the year, perceived a strong similarity between the MACOS principles

in MACOS class and those in science class. Comparing the same correlation between MACOS and science for time 2 (see Table 4.5, page 95) indicated a reverse in scores (.96 to -.15). In view of these correlations from time 1 and time 2, the possibility of transfer effect as reflected in similarities of student scores is hardly possible. The extensive change from time 1 to time 2 would support this possibility.

Correlation between MACOS and English class for time 2 is -.50. The score is similar to time 1 (-.87) which would potentially indicate that students consistently perceived little similarity between MACOS and English class. In fact, as students perceived more of the MACOS principle within their MACOS classes they perceived proportionally less of the same principles in English class.

A correlation of -.92 was obtained between English and science class for time 2. Indications are that students perceived more MACOS principles within the science classes than the English classes. In fact, the -.92 correlation indicates that the more students positively perceived MACOS principles operating in science class, the less they perceived the same principles operating in English class for time 2.

Correlations do not imply causation therefore inferential tests of differences between content areas were performed.

The initial question to be answered was: Do the students' mean scores in MACOS classes change over time?

This question was responded to by the students in respect to their recorded scores in the MACOS classes on the questionnaire. A t-test was applied to indicate if there was any statistically significant change over time (six months) as revealed by the differences in mean scores. The results of this inquiry are found in Table 4.6.

TABLE 4.6.--t-test for time one, time two. Student $\bar{x}$ scores on questionnaire.

	Time 1	Time 2	t
Mean	48.06	46.73	1.24
	Not Significant		

It can be inferred from the results of the t-test ($t = 1.24$) that there is no significant statistical difference in student responses over time in their MACOS classes.

The next question to be answered is: Do the mean scores of students in English and science class differ over time?

A two-way analysis of variance[4] was performed to determine if there was a significant differenct between times 1 and 2. The results are recorded in Table 4.7.

TABLE 4.7.--Two-way analysis, English/science--Students.

Analysis of Variance Student Responses				
Source	df	ss	MS	F
Time	1	5.26	5.26	.003
Subject Area	1	90.30	90.30	.055
Interaction	1	95.56	95.56	.059
Within	36	58223.66	1617.60	
Total	39			
		Not Significant		

There were no statistical significant differences for either time, subject area, or interaction.

[4]John T. Roscoe, Fundamental Research Statistics, Holt, Rinehart and Winston, Inc., New York, 1969.

RESULTS OF TEACHER OPINIONAIRE

The following tables report the results of the Teacher Opinionaire. Teachers at Jefferson School responded to the questionnaire near the end of the 1970-71 school year. At that time they had approximately nine months experience in teaching in the MACOS curriculum and exposure to a number of in-service workshops.

The factual information on the nine teachers responding to the opinionaire are presented in Table 4.8. The answers to the first six questions indicate the range in number of years experience, education, and attitude toward subjects.

Responses to questions eight through fifteen are reported in Table 4.9 in summary fashion. Short capsule statements for each of the teachers' responses to questions 8, 10, 12, 14, & 15 were put into groups. Responses that were similar were then placed under the category of Response (see Table 4.9). Guidelines for categories were determined by the general indications of the responses themselves. Additional guidelines for

TABLE 4.8.--Summary of Teacher Opinionaire. Questions 1 through 6.

1.	Sex: Male	1
	Female	8
2.	Level of education:	
	B.A. (or B.S.) certified	4
	B.A. (or B.S.) not certified	0
	B.A. (or B.S.) and 15 or more hours	4
	M.A. or M.S.	1
3.	Number of MACOS in-service workshops attended:	
	All	5
	Most	4
4.	Years of teaching experience:	
	1-3 years	4
	4-6 years	1
	7-10 years	1
	11-15 years	0
	16-20 years	1
	21 plus	2
5.	When last attended college:	
	1 year or less ago	5
	1-3 years ago	3
	4-5 years ago	0
	5 or more years ago	1
	never	0

6. Subjects rated according to teachers' enjoyment:

English	Mathematics	Reading
1--one	1--seven	1--three
2--six	2--one	2--three
3--one	3--none	3--one
4--one	4--none	4--one
5--none	5--one	5--one

Science	Social Stud.	Other
1--four	1--four	music & gym--one
2--two	2--three	art--one
3--one	3--two	spelling--one
4--two	4--none	
5--none	5--none	

TABLE 4.9.--Summary of teachers' opinionaire questions 7 through 15.

Question	Category of Response	Examples	f*
7. Change in teaching method social studies	1 yes**		4
	2		4
	3		1
	4 no		0
8. Episode to illustrate method change	(a) Methodological techniques	Increased activities--variety; less single book orientation; more questioning and discussion.	7
	(b) Role of teacher	Discussion guide; maintenance of multiple activities.	6
	(c) Classroom organization	Intensive small group work; multiple activities.	7
	(d) Role of student	Increased participation; students eager.	4
	(e) Little change	Open atmosphere and activities last year.	1
	(f) No response		1

*f--teachers' responses to these questions were reported in capsule form and then generally categorized. The number of teachers (N = 9 for MACOS; N = 5 for English, and N = 4 for science) who had similar response to each category were tallied.

**A 1-4 scale was used to indicate the degree of yes or no answers. 1 = definitely yes, 2 = yes with some reservation, 3 = no with reservation, and 4 = definitely no.

TABLE 4.9.--Cont.

Question	Category of Response	Examples	f
9. Change in student behavior in social studies.	1 yes		4
	2		5
	3		0
	4 no		0
10. Episode illustrating change.	(a) Atmosphere changed	Awake more; freer to express opinion; more involved.	8
	(b) Change in affective environment	Definite enjoyment; expressed interest; high enthusiasm.	5
	(c) Change in level of class discussion	More response; more versed in subject.	5
	(d) Change in personal qualities	More open minded; more tolerant.	4
	(e) No response		2
11. a. Change in teaching style in English.	1 yes	. . . . .	0
	2	. . . . .	2
	3	. . . . .	3
	4 no	. . . . .	0
b. Change in teaching style in science.	1 yes	. . . . .	0
	2	. . . . .	2
	3	. . . . .	1
	4 no	. . . . .	1

TABLE 4.9.--Cont.

Question	Category of Response	Examples	f
12. Episode illustrating change.	I. English classes		
	A. Methodological techniques	More small group work discussions; more open; more use of imagination.	2
	B. Role of teacher		0
	C. Class organization		0
	D. Role of student		0
	E. Little change	Small groups used last year.	3
	II. Science classes		
	A. Methodological techniques	Questioning techniques increased.	1
	B. Role of teacher		0
	C. Class organization	More relaxed	1
	D. Role of student	Somewhat more involved; somewhat more verbal.	2
	E. Little change	Control in class.	3
13. Change in <u>pupil behavior</u> in English class	I. English		
	1 yes	. . . . .	0
	2	. . . . .	4
	3	. . . . .	1
	4 no	. . . . .	0

TABLE 4.9.--Cont.

Question	Category of Response	Examples	f
	II. Science		
	1 yes	. . . . .	0
	2	. . . . .	2
	3	. . . . .	2
	4 no	. . . . .	0
14. Episode illustrating change.	I. English		
	A. Atmosphere changed	More at east asking questions and relating ideas.	2
	B. Change in affective environment	More exchanging of ideas; desire to work together.	2
	C. Change in level of class discussion	More willing to answer questions.	1
	D. Change in personal qualities	More able to express opinions	2
	E. Little change		2
	II. Science		
	A. Atmosphere changed	Freer, less inhibited.	2
	B. Change in affective environment	Not afraid of being wrong.	2
	C. Change in level of class discussion	More involvement.	3
	D. Change in personal qualities	More independent.	1

TABLE 4.9.--Cont.

Question	Category of Response	Examples	f
	E. Little change	Related well with students before.	1
15. Teaching MACOS next year.	yes	. . . . .	8
	no	. . . . .	1
	no response	. . . . .	1
Reason	a. Flexible-concepts and materials-support	Good supplementary materials; students individually respond; not tied down with one approach.	3
	b. Development of critical thinking ability	Increase in reasoning ability can go in depth.	3
	c. Empathy for others	Concern for others; feeling for all humans.	4
	d. Self-improvement	Lot to offer teachers-learning; new meaning to learning.	3
	e. Student participation; satisfied learning	Children move extensively participate; students enjoy the learning experience.	4
	f. Student interaction with other.	Children help each other.	2

the categories were established from those suggested in the research report by the Cornell team.[5] Specifically, the authors validated the use of the MACOS Opinionaire as one instrument to indicate the child centered behavior of MACOS teachers. Modifications were made in some questions to facilitate the collection of teacher opinions on the impact of the MACOS curriculum on English and science classes.

The responses to questions seven and eight seem to indicate that most teachers felt there was some change in their teaching style in social studies, compared to the previous year, as a result of MACOS. Primarily their responses were indicative of change in method, teacher role and classroom organization (see Table 4.9).

Questions nine and ten also seemed to reflect a change in students' behavior as perceived by the teachers of MACOS classes. Essentially, these changes were noticed in terms of the affective domain. Students were freer to express opinions, showed enthusiasm for the subject and

---

[5]Sue A. Deffenbaugh, Susan M. Dalfen, Richard E. Ripple, An Investigation of an Instrument Battery Related to the Expectancies for Student-Centered Teaching Behaviors in Man: A Course of Study. Dept. of Ed., Cornell University, Ithaca, New York, 1970. Final report Eastern Regional Institute for Education, Syracuse, New York.

were generally more responsive (see Table 4.9) as perceived by the MACOS teachers.

The responses to questions eleven through fourteen seemed to show that teachers perceived little change in their teaching style in English or science class as a result of their exposure to the MACOS curriculum. In addition, little change was perceived in the students' behavior in either of these subjects (science and English). However, teachers did indicate that there was some perceived change in the students' behavior in English class as compared to science class (see Table 4.9). Primarily, the perceived change was seen in students' feeling more at ease to questions and relate ideas in the English classes.

Responses to question fifteen indicated that most teachers at Jefferson School would choose to teach MACOS next year. Generally, they were enthusiastic about the style and diversity of the curriculum (see Table 4.9).

SUMMARY

Chapter IV presented the analysis of data collected and reported the findings of the study. Data were analyzed in relation to three statistical methods: correlation,

t-test, and a two-way analysis of variance. The purpose was to statistically determine if there was any transfer effect of the MACOS process to English or science classes. In addition, the impact of the MACOS curriculum within the MACOS classes was examined. A teacher opinionaire reflected the influence of the MACOS process as perceived by the MACOS teachers.

The combined results of all three statistical computations generally indicated no significance (see Tables 4.2, 4.3, 4.4) regarding transfer effects. The two main hypotheses stated in the null form were accepted. Specifically, there were two notable exceptions between correlations in MACOS and science classes. One, the obtained correlation between the objectives/procedures in MACOS and science class was (.59). This obtained correlation of .59 seems to indicate some degree of transfer effect as reflected in the similarity of MACOS and science class objectives/procedures and compared to the same correlation for time one (.009). A second significant correltion (.96) was obtained between students' scores on MACOS and science class for time one. Contrasting the same correlation for time two (-.15) records a reverse which seems to indicate

a lack of consistent statistical significance in transfer effect from time one to time two.

Comparing mean scores of both teachers and students within MACOS classes, from time one and time two, seemingly indicated the intended MACOS curriculum was operationalized within MACOS classes. However, t-scores calculated between time one and time two revealed no significant statistical gain in mean scores for either teachers' scores or students' scores (teachers $t = .85$) (students $t = 1.24$).

It was statistically concluded that there was little significant transfer effect of the MACOS process to English or science classes. This was consistent with the statistical treatment of the teachers' scores and the scores of students.

CHAPTER V

SUMMARY, IMPLICATIONS, DISCUSSION, RECOMMENDATIONS

Chapter V presents the findings and implications of this study. Since the nature of this research has been exploratory, suggestions for future research are discussed. Recommendations are included to help improve the style and form of this type study for future research.

SUMMARY OF THE STUDY

The purpose of this study has been to examine the transfer effects of Man: A Course of Study, to other elementary subjects. MACOS is a unique social studies approach for elementary teachers and students. The course process is part of an increasing new approach to learning. Researchers previously had not empirically studied the influence of MACOS on other subjects taught in the elementary school curriculum. This gap in the literature is particularly significant because (1) process education in general

is a part of a growing trend and (2) some advocates of MACOS allege that the processes underlying MACOS should underlie the entire elementary curriculum. The sixth grade teachers and students of Jefferson School in Mason, Michigan, experienced MACOS for the first time this year (1970-71). Since the design of the course includes a process that extends beyond the usual school curriculum, specific questions as to the transfer effects of the MACOS process were raised.

Two hypotheses were empirically examined to help indicate the transfer effects of the course.

> H_o1.--There seems to be a transfer effect of the MACOS process as reflected in the teachers' written class objectives and procedures, to English and science classes.
>
> H_o2.--Students who experience developmentally the MACOS process seem to gradually recognize the MACOS principles enacted in their: 1) English classes, 2) science classes, and 3) MACOS classes.

Data in relationship to the two above hypotheses were generated by use of three specifically designed instruments (Appendix A). A list of nine validated MACOS principles were compared to teachers' written objectives/procedures in MACOS, English and/or science classes. A brief form was designed to record the objectives/procedures.

Two specially trained Raters numerically judged each set of objectives/procedures in relation to closeness to the Nine MACOS Principles. Additional numerical data were gathered from a random sample of ten students from each of the three classes (MACOS, English, science) by use of a specifically designed questionnaire (Appendix A).

Scores generated from teachers' written class objectives/procedures and students' scores on the questionnaire were statistically analyzed. These scores were gathered twice during the school year; once in early November and again in early May. Teacher and student scores were independently compared to MACOS principles from time one to time two. Three statistical methods (correlations, t-test, two-way analysis of variance) were used to indicate if there was any statistical significance as to the transfer effects.

Additional information was gathered from a Teacher Opinionaire (Appendix A). Essentially this instrument reflected the teachers' perceived impact of the MACOS process on themselves and their students in MACOS, English, and science classes.

Results of this study indicated that there was little statistically significant transfer effect of the

MACOS process to English or science classes. There was no significant difference when comparing teachers' or students' scores between courses over time and between Raters' judgments and students' perceptions.

The actual mean scores within the MACOS classes seemed to indicate that the course process was in operation in theory. Students' mean scores (see Table 4.6, page 97) on the questionnaire and the Raters' judgments of Teachers' written objectives/procedures from time one to time two seem to indicate this. Analyzed mean scores by use of a t-test indicated no significant gain from time one to time two for either teachers or students.

Results of the Teacher Opinionaire which reflected their perceived influence of MACOS supported the empirical findings. Teachers seemed to feel the course was effective in changing their teaching style in social studies class as compared to last year. Teachers felt they were generally more open and flexible regarding response to students and content. Further, they generally felt students' behavior was changed. Students were more enthusiastic about social studies and more responsive. Regarding the influence of the MACOS process on their teaching style in English-science classes, teachers perceived little

influence. This was generally perceived as true regarding teaching style and student behavior. One exception was that the English teachers reported in their opinionaire that they felt there was a possible change in students. Generally it was felt the students were more alert and questioned more in their English classes compared to last year.

IMPLICATIONS OF THE RESULTS OF THE STUDY

Implications of this study, although not conclusive, seem to indicate that Man: A Course of Study has limited influence on changing the teaching styles of teachers in English and science classes at Jefferson Elementary School, Mason, Michigan. These results appear to be significant in terms of the first year's exposure of the MACOS concepts (represented by the nine MACOS Principles) used to measure the transfer effects. Teachers' written objectives/procedures in English and science class did not have a significant relationship to the MACOS principles practiced in MACOS classes they taught. Students' responses to a specific questionnaire indicated no

consistent recognition of MACOS principles enacted in English or science classes.

Results from within the MACOS classes themselves seem to indicate the principles underlying the course were in operation. Essentially this was reflected in the Raters' judgment of teacher objectives/procedures for MACOS classes and the students' perceptions indicated in their questionnaire. This seems to be consistent with other research and reactions concerning MACOS; therefore, could be considered additional evidence of the effectiveness of the course design to change teacher and student behavior in social studies. Basically, the change is from a teacher dominated, single text, testing approach in social studies to a more open, flexible teaching style; socially cooperative, multi-media approach.[1]

DISCUSSION

In no way can the results of this study be considered conclusive regarding the transfer effects of the MACOS curriculum. The implications of the results impinge

---

[1] Richard Bumstead, "Man: A Course of Study," Educate, September, 1970, p. 22.

on the rapidly developing, complex movement of process education. The MACOS course, with its strategies, is a model within the total movement. From the beginning, the author could not be concerned with cause and effect, but more with the trends and an exploratory examination of the impact of the MACOS course.

Several limitations influenced the generalizability of the implications of this study. Four of the more limiting factors are:

1. It is unlikely that the Nine MACOS Principles used to evaluate the transfer effect could be theoretically operating or projected within a teachers' written objectives/procedures for a given week, in a given class. Therefore, the theoretical maximum score of 90 was hardly possible. However, the correlations computed between MACOS class scores and English, science classes could have been potentially positive. The obtained mean scores of the MACOS classes sompared to the obtained scores in English/Science would be a reasonable comparison. Further, students were not constrained to evaluate only a week's class, thus had the

potential to perceive a number of the MACOS principles in operation.

2. No specific attempt was made to evaluate what MACOS strategies might have been present in the Jefferson School curriculum prior to the inclusion of the MACOS course. It was assumed by a general survey and the unique quality of the MACOS curriculum that little of the strategies were previously enacted.

3. Attempting to measure the transfer effects during the first year's exposure to MACOS may have not been totally feasible. Primarily because of the complex nature of the course strategies and the rather extensive shift required of teaching learning styles.

4. The experimenter made little attempt to evaluatively observe classroom operations. Reliance was placed on teachers' projecting in their class objectives/procedures evidence of the MACOS strategies. Classroom observations might have produced further evidence to substantiate the implications

of this study. However, consistency of the independent data gathered from the students and teachers were in agreement. This would give reasonable support that the implications are valid.

5. The statistical design of this study has been to analyze combined principle scores. Analysis was directed toward statistically examining what portion of the total MACOS principles may have transferred to other courses. The statistical treatment used may have obscured the individual transfer of one or more of the Nine MACOS Principles. A preliminary survey of the scores per item recorded on teachers' objectives/procedures does not seem to indicate this.

The amount of time, resources available, and the complexity of the MACOS curriculum precluded the extensive, tightly controlled design which would expand the generalizability of the results. These limitations were accepted within the context of the researcher's objectives of an exploratory study into a rapidly expanding elementary course of study.

Much of the process approach to learning in general places emphasis on assisting the learner in the discovery, acquisition, organization, and application of information.[2] A process approach to learning requires considerable shift in emphasis compared to the more usual cognitive, achievement based approach.

Process curriculum or learning is an extensive concept. In part it combines such theories as inquiry, discovery, and child-centeredness. Like most new educational concepts, process learning is elusive and generally defined from differing viewpoints. There is uniformity in that many authors (Bruner, Gagne', Skinner, Williams, Piaget, Guilford, Crutchfield)[3] agree that the new curriculum includes acquiring intellectual skills rather than the specific acquisition of knowledge. Gagne' has referred to these skills as "learning capabilities," "intellectual skills," statements of "what the individual can do," and "intellectual activities."[4] Bruner also calls them "skills"

---

[2]Henry P. Cole, "Process Curricula and Creativity Development," The Journal of Creative Behavior, Vol. 3, No. 4, Fall, 1969, p. 243.

[3]Ibid., p. 244.

[4]Ibid., p. 244.

and "intellectual habits."[5] Skinner calls them "self management behaviors"; Williams, "processes"; Guilford, "operations"; and Piaget, "logical operations."[6]

In this author's view, Process Education in general and as specifically emanated in MACOS, will continue to develop. Presently, the movement provides a rational guideline for some of the major problems facing education. This seems especially true in relationship to the dilemma of what and how to teach within an extensively changing, developing bank of knowledge. The strong emphasis on the affective domain or the human factor promotes involvement on the part of teachers and students. This should help to overcome the feeling of apathy or state of powerlessness so often evident in students today.[7] Further, the flexibility of the approach, especially as advocated within the MACOS curriculum, established a dignified means of helping teachers and students gradually make the transition from the more usual teacher directed learning mode to the more socially cooperative learning mode. In a recent article

---

[5] Ibid., p. 244.

[6] Ibid., p. 244.

[7] Rollo May, Love and Will, W. W. Norton and Co., 1969, pp. 14-15.

Henry Cole, regarding justification for Process Education, stated:

> The only feasible approach is to help the student acquire some of the more relevant and central information and those intellectual skills which will enable him to adapt and expand this limited knowledge acquired in his formal schooling.
>
> The acquisition of essential intellectual skills insures an individual who can successfully solve problems and this leads to a healthy and productive personality.
>
> Intellectual skills are more widely applicable than knowledge. If we wish what the student learns to exhibit broad transfer to all realms of his experience, then by definition we must be concerned with the promotion of intellectual skills.
>
> Intellectual skills are more permanent than other types of learning. It has repeatedly been demonstrated that information which is learned is subject to rapid extinction, but that intellectual skills are frequently life long.[8]

RECOMMENDATIONS FOR FURTHER RESEARCH

As the Process Education trend continues to develop, research on effectiveness and impact will become increasingly necessary but difficult. The multiple variables linked within the affective domain may be impossible to

---

[8]Henry P. Cole, "Process Curricula and Creativity Development," The Journal of Creative Behavior, Vol. 3, No. 4, Fall 1969, pp. 245-246.

control or measure empirically. Nevertheless, efforts must be attempted to validate the trend. New and imaginative research methods need to be developed in line with the goals and objectives of the movement itself. Else the movement may end up to be only a brief, but fashionable swing on a pendulum.

Regarding the MACOS course, there are a number of recommendations for future research. The nature of this research paper has been exploratory and relatively limited in scope in examining the transfer effect, however, the endeavor was still too macroscopic. The implications and operating theories within the MACOS course need a more microscopic approach. It is suggested that future researchers attempt to isolate smaller portions of the MACOS curriculum in order to examine the impact and the transfer effects.

Research on the MACOS course is recommended in the following six areas:

1. Questioning mode--The framework and type of questioning mode included in MACOS is generally defined in the course rationale therefore examination within the context of the course and possible

transfer to other courses of study is possible. Such an endeavor would include further identifying the style of questioning encouraged in the MACOS classroom and validating it by specific observations or other methods.

2. Teachers' written objectives/procedures--Further research needs to be developed that would more extensively establish the type or kind of objectives/procedures good MACOS teachers write. It is assumed that teachers have a cognitive recognition of the affective domain. Research of this type could include sampling the type of objectives/procedures written by those teachers of MACOS classes deemed exceptional by the MACOS experts. Comparisons between various exceptional teachers could be made to establish what similarities there may be. Once a specific type mode is identified, the transfer effect to other classes should be more easily examined significantly.

3. Values--Part of the MACOS curriculum attempts to sensitize the child to the arbitrary nature of belief and value systems and to recognize them as

the useful products of creative minds rather than to view their own values as absolute standards against which all others should be judged.[9] Further research is needed to substantiate this claim. It would be significant to examine the openness of MACOS students to other divergent value systems outside the MACOS classroom. Comparisons can be made to those students who have not been exposed to the course.

4. Teacher Training--Perhaps the most essential part of the continued success of the MACOS course is the pre- and in-service training of teachers. Continued research is needed to establish the most productive and significant training program. It is suggested that parts of the present training program be isolated. For example, the skill required of teachers in posing and promoting in depth questions could be improved by establishing and then comparing two or more different type in-service programs. This could be done in conjunction with two or more researchers who develop specifically

[9] Ibid., p. 256.

different training designs but agree to the same method of examination of success.

The pre- and in-service training program for MACOS teachers is not specifically designed for transfer of skills and methods to other subjects. This training program could be re-examined in order to specifically include techniques that could be utilized in other subject areas. Methods of research could then be established to examine the degree of transfer of these techniques to other subjects.

5. One of the limitations of this study has been the statistical treatment of combined mean scores. This process may have obscured some of the transfer of specific MACOS principles to other courses. Future research should be directed toward examing each of the Nine MACOS Principles for transfer to other subjects.

6. Supportive Environment for MACOS--The MACOS curriculum does imply rather extensive change in the learning environment especially when compared to the more usual tightly controlled, disciplined,

and high achievement emphasis found in many elementary schools. There was perceived indication by some teachers included in this study that there was a lack of acceptance on the part of the Jefferson School administration of the high activity and change of learning mode. What effect administrative attitude has on teachers and the success of the MACOS curriculum needs further research. It is suggested that elements of receptivity by school administrators of the MACOS curriculum be examined and compared to determine what effect the administration's attitude has on the attitudes of teachers toward MACOS.

SUMMARY

Implications, discussion, and recommendations for future research, based on the findings of this study, were presented in this chapter. Implications were discussed as they related to the transfer effects of the MACOS course and the general trend of Process Education. Further, five different possibilities for research to specifically examine the MACOS curriculum and the transfer effect were

suggested. An additional research suggestion was posed to consider the effects of supportive or non-supportive administrative policy regarding the enacted learning theories of the MACOS curriculum.

Man: A Course of Study presents a challenging new learning mode. Its implications are broad and refreshing. They provide a hopeful sign in a transitional age.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

Bruner, Jerome. On Knowing: Essays for the Left Hand. Harvard University: Kelknap Press, 1962.

_____. The Process of Education. New York: Random House, 1960.

_____. Toward a Theory of Instruction. New York: W. W. Norton & Company, Inc., 1967.

_____, and P. B. Dow. Man: A Course of Study. Cambridge, Massachusetts: Educational Development Center, 1967. A description of an elementary social studies curriculum.

_____, J. J. Goodnow, and G. A. Austin. A Study of Thinking. New York: John Wiley & Sons, Inc., 1956.

_____, R. R. Olver, P. M. Greenfield, et al. Studies in Cognitive Growth. New York: John Wiley & Sons, Inc., 1966.

Deffenbaugh, Sue, Susan M. Dalfen, Richard E. Ripple. An Investigation of an Instrument Battery Related to the Expectancies for Student-Centered Teaching Behaviors in Man: A Course of Study. A Final Report Prepared for Eastern Regional Institute for Education. Department of Education, Cornell University, Ithaca, New York, 1970.

Edwards, Allen L. Statistical Analysis. New York: Holt, Rinehart and Winston, 1958.

Hanley, Janet P., and others. Curiosity/Competence/Community: An Evaluation of Man: A Course of Study. Cambridge, Mass.: Education Development Center, Inc., 1970.

Jones, Richard M. Fantasy and Feeling in Education. New York: Harper & Row, 1968.

Joyce, William W., Robert G. Oana, and W. Robert Houston. Elementary Education in the Seventies. New York: Holt, Rinehart and Winston, Inc., 1970.

Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart and Winston, Inc., 1964.

May, Rollo. Love and Will. New York: W. W. Norton and Co., 1969.

Postman, Neil and Charles Weingartner. Teaching as a Subversive Activity. New York: Delacorte Press, 1969.

Roscoe, John T. Fundamental Research Statistics. New York: Holt, Rinehart and Winston, Inc., 1969.

Periodical Literature

Bruner, Jerome S. "Education as Social Invention," Contemporary Educational Psychology: Selected Essays, Edited by R. M. Jones. New York: Harper & Row, 1967.

_____. "The Course of Cognitive Growth," Contemporary Educational Psychology: Selected Essays, Edited by R. M. Jones. New York: Harper & Row, 1967.

_____. "The Growth of Mind," American Psychology, XX, 12 (1965).

_____. "Needed: A Theory of Instruction," Educational Leadership, XX (May, 1963).

_____. "The Act of Discovery," Readings in Learning and Human Abilities, Edited by Richard E. Ripple. New York: Harper and Row, 1964.

_____, and Elizabeth Hall. "Bad Education, a Conversation with Jerome Bruner," Psychology Today, 4:7, December, 1970.

Bumstead, Richard. "Man: A Course of Study," Educate, September, 1970.

Cole, Henry P. "Process Curricula and Creativity Development," The Journal of Creative Behavior, Vol. 3, No. 4, Fall, 1969.

Ferber, Ellen. "What Makes Humans Human," American Education, May, 1970.

Hicks, Nancy. "10-Year-Olds Encouraged to Think Big," The New York Times, November 16, 1969.

Joyce, William W. "MACOS: A Report from the Inner-City," Social Education, March, 1970.

Kubie, Lawrence S. "The Forgotten Man of Education," Contemporary Educational Psychology, Edited by R. M. Jones. New York: Harper & Row, 1967, pp. 69-71.

Morrissett, and others. "Social Studies Curriculum Development Projects and Problems." National Counsel for Social Studies, Yearbook, 1970.

Sanders, Norris M., and Marlin L. Tanck. "A Critical Appraisal of Twenty-Six National Social Studies Projects," Social Education, Vol. 34, No. 4, April, 1970.

"Teaching Man to Children," Time, 50, January 19, 1970.

Pamphlets

Man: A Course of Study, a pamphlet, Curriculum Development Associates, Inc., Washington, D.C.

Man: A Course of Study--Talks to Teachers, Educational Development Corporation, Cambridge, Mass., 1969, No. 1.

Man: A Course of Study--A Guide to the Course, Educational Development Corporation, Cambridge, Mass., 1969, No. 2.

Introductory Lessons--Salmon, Educational Development Corporation, Cambridge, Mass., 1969, No. 3.

Herring Gulls, Educational Development Corporation, Cambridge, Mass., 1969, No. 4.

Baboons, Educational Development Corporation, Cambridge, Mass., 1969, No. 5.

The Netsilik Eskimo at the Inland Camp, Educational Development Corporation, Cambridge, Mass., 1969, No. 6.

The Netsilik Eskimo on the Sea Ice, Educational Development Corporation, Cambridge, Mass., 1969, No. 7.

Man: A Course of Study--Seminars for Teachers, Educational Development Corporation, Cambridge, Mass., 1969, No. 8.

Man: A Course of Study--Evaluation Strategies, Educational Development Corporation, Cambridge, Mass., 1969, No. 9.

Other Sources

Man: A Course of Study, A tape recording, Eastern Regional Institute for Education, "Introduction to MACOS," narrated by Jerome Bruner.

Herlihy, John G., Henry P. Cole, and Myra T. Herlihy. "The Campus Team--A Change Strategy for Preservice and Inservice Teacher Education," Eastern Regional Institute for Education, Syracuse, New York. (Paper presented at the annual meeting of the American Educational Research Association, New York City, February 6, 1971.)

Ryan, Thomas F. "An Analysis of an Inquiry-Centered, In-Service Social Studies Program for Elementary Teachers." Unpublished Doctoral thesis, Michigan State University, East Lansing, Michigan, 1969.

APPENDIX A

APPENDIX A

BASIC PRINCIPLES OF THE MACOS PROCESS

1. Contrast is a major teaching strategy used to provide a framework for individually discovering and engineering thought. Contrast helps stimulate interest and establish motivation.

2. Multiple activities and experiences are provided as a means to activate and involve the student in the learning process.

3. In the learning environment students should feel free to be spontaneous, willing and compelled to rish their hunches, intuitive thoughts or guesses.

4. Logical comparison of ideas and information and affective comparison of feelings are used as major teaching strategies.

5. Classroom dialogue in response to content is flexible on a personal level between pupil and pupil as well as pupil and teacher.

6. Concepts are developed within a unifying set of conceptual, social, and moral themes.

7. Classroom procedures and control are developed co-operatively between teacher and students.

8. Evaluation of student progress and involvement is individualized and personalized by use of small group discussions on reaction to content and student development of projects that reflect an integration of concepts individually assimilated.

9. The teacher is a co-learner with students and helps in exploring open-ended concepts in depth.

OBJECTIVES-PROCEDURE DIARY

Week of November 2-6--1970

Subject--_____

Instructions--Would you please list below your class objectives and procedures for the week of November 2nd to November 6th. Include as many of your intentions and activities as possible. Statements should be brief and in summary fashion. Under the procedure or activities heading also include the approximate percentage of time the class spent doing the specific activity during the week. Only include in-class time in your estimate. Attached is a sample diary for your convenience as a guide.

Objectives for _____ class--Week of November 2-6--1970

_____

_____

_____

_____

_____

_____

_____

Procedures and/or Activities Approx. percent. of time

_____

_____

_____

_____

_____

_____

_____

STUDENT QUESTIONNAIRE

In my _____ class: DATE _____

	Always true	True most of the time	True about half of the time	Seldom true	Not true
1. The students can tell what they don't like about the materials used (books, film, worksheets, etc.).....	1	2	3	4	5
2. Students have a chance to learn how to listen and understand one another.....	1	2	3	4	5
3. Students make up their own assignments.....	1	2	3	4	5
4. Students learn how to ask questions which need to be talked about for a long time.....	1	2	3	4	5
5. Students discuss things in small groups.....	1	2	3	4	5
6. Students begin the class without the teacher.....	1	2	3	4	5
7. Students play unusual games to help them understand what they are studying about.....	1	2	3	4	5
8. Students can try to guess what the answer to a problem might be.....	1	2	3	4	5
9. Students see and use many things (magazines, films, booklets, records, etc.) to help them think about what they are studying.....	1	2	3	4	5
10. When students guess at solutions to problems other students help them think about their guess.....	1	2	3	4	5
11. The teacher does not know what the right answer is....	1	2	3	4	5
12. The teacher gives students the chance to find many ways of thinking about a problem.....	1	2	3	4	5
13. The teacher spends time helping each student with his or her own special problems.....	1	2	3	4	5
14. The teacher likes students to ask hard questions.....	1	2	3	4	5
15. The teacher can learn from the students.....	1	2	3	4	5
16. The teacher likes students to help run the class.....	1	2	3	4	5

TEACHER OPINIONAIRE

DIRECTIONS: The following opinionaire is part of my research on MACOS. Since you, as the teacher, are essential to the success of any curriculum, I would like to obtain your opinions on certain issues. Please fill out the following questionnaire and attached sheets as carefully as possible.

Thank you very much for your cooperation.

1. Sex-- M F (Circle one)

2. Level of education: (Circle one)

   B.A. (or B.S.) certified

   B.A. (or B.S.) not certified

   B.A. (or B.S.) and 15 or more hours

   M.A. (or M.S.)

   Other _____

3. Number of MACOS in-service workshops attended: (circle answer)

   all

   most

   about one half

   less than one half

   none

4. Years of teaching experience: (circle answer)

   1-3 11-15

   4-6 16-20 other_____

   7-10 21 or more

5. When did you last attend a college or adult evening class that dealt with curriculum development and/or innovations in elementary education? (Do not include your MACOS experiences)

   Check (x) one

   _____ 1 year or less ago _____ 4-5 years ago

   _____ 1-3 years ago _____ 5 and more years ago

   _____ never

6. Please rate the subjects listed below according to how much you enjoy teaching them. Use the following scale:

   1--very enjoyable
   2--moderately enjoyable
   3--neutral
   4--moderately unenjoyable
   5--very unenjoyable

   _____ English
   _____ Mathematics
   _____ Reading
   _____ Science
   _____ Social Studies
   _____ Other (Please specify)

7. Do your teaching methods in MACOS differ from those you used in your social studies class last year?

   (On the following 1-4 scale place a mark on the vertical line that best represents your opinion. (e.g., line #1 = yes; line #4 = no))

   YES |---------|---------|---------| NO
   1 2 3 4

8. If you can provide a descriptive classroom episode that illustrates your response to question #7, it would be most helpful.

   _____
   _____
   _____
   _____

9. Do your pupils behave differently in MACOS than they did in your social studies class last year? (Answer with same method of marking as in question #7.)

   YES ---------- NO
   1 2 3 4

10. If you can provide a descriptive classroom episode that illustrates your response to the previous question, it would be most helpful.

    _____
    _____
    _____
    _____

11. Has MACOS changed your teaching style in your English or Science class? (Please use same methods of marking answer as in two previous questions.)

ENGLISH YES ---------- NO
1 2 3 4

SCIENCE YES ---------- NO
1 2 3 4

12. If you can provide a descriptive classroom episode that illustrates your response to question #11, it would be most helpful.

_____

_____

_____

_____

13. Has MACOS changed your pupils' behavior in your English or Science class? (Please use same method of marking answer as in three previous questions.)

ENGLISH YES ---------- NO
1 2 3 4

SCIENCE YES ---------- NO
1 2 3 4

14. If you can provide a descriptive classroom episode that illustrates your response to question #13, it would be helpful.

_____

_____

_____

_____

15. If you were given a choice would you teach MACOS next year?

_____yes _____no

Why, or why not?

_____

_____

_____

_____

APPENDIX B

APPENDIX B

Dear MACOS Expert,

Presently I am doing a study for my dissertation of the carry-over effects of the MACOS process. Recently Dr. Herlihy and I had a chance to discuss my study. He agreed that some members of the MACOS staff could help, therefore the reason for this paper.

On this page, I have listed some educational principles incorporated in the elementary school social studies program "Man, A Course of Study" (MACOS). These principles have been drawn from literature describing the MACOS Program. This list is not intended to be an all inclusive one; however, it is meant to be a substantial representation of the MACOS principles that would be a part of the teaching process.

The purpose for establishing this list is to provide a base for examining teachers written objectives and class activities in their MACOS class and in their English class. I'm interested in the carry-over effects of the MACOS process on other classes.

Directions

In the blank space before each principle place the number 1, 2, or 3.

If the statement is a clear representation of a MACOS principle place a number 1 in the blank space.

If the statement is a good representation of MACOS but should be reworded place a number 2 in the blank space preceding it. (If rewriting is necessary please feel free to make the corrections in the space below the statement.)

If the statement is not a representation of a MACOS principle place a number 3 in the blank space.

_____ Contrast is a major teaching strategy used to provide a framework for individually discovering and engineering thought.

_____ Multiple paths to learning are provided as a means to activate and involve the student.

_____ Safe environment where students are spontaneous and willing to risk their hunches, intuitive thoughts or guesses.

_____ Teacher is co-learner with students and helps in exploring open-ended concepts in depth.

_____ Classroom dialogue in response to content is on a personal level and flexible.

_____ Evaluation personalized by small group interviews and integrative projects.

_____ Classroom procedures and control are developed co-operatively with teacher and students.

_____ Comparison is used as a major teaching strategy to help extend the dimensions of a concept.

_____ Concepts are developed in an interrelated and on-going way.

_____ The classroom provides a laboratory experience for the study of learning and the teaching process.

WHEN YOU HAVE COMPLETED THIS PLEASE RETURN IT TO JOHN SO HE CAN RETURN IT TO ME. THANK YOU VERY MUCH FOR YOUR HELP.

Ron Hager

SAMPLE

Objectives for Science Class, Week of November 2-6

Have students explore the implications of weather

Encourage students to gather ideas concerning effects of weather

---

Provide different media for information

	1	2	3	4	5	6	7	8	9
principles related to degree of relationship									

Activities or Procedures Used to Meet Objectives

Students have choice to use media for information--film, filmstrip, recording, radio, pictures, weather game 50%

Students work in small groups to generate ideas 30%

Individual sharing of ideas with class 20%

	1	2	3	4	5	6	7	8	9
principles related to degree of relationship									

SAMPLE

Objectives for English Class, Week of November 2-6

Explain to students parts of speech--verb, noun

Write sentences identifying parts of speech

Evaluate students understanding of parts of speech

	1	2	3	4	5	6	7	8	9
principles related to degree of relationship									

Procedures or Activities to Meet Above Objectives

Teacher lecture 40%

Worksheets in class on noun & verb 20%

Class discussion 10%

Tests 30%

	1	2	3	4	5	6	7	8	9
principles related to degree of relationship									