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AUTHOR Thomas, Robert G.
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ABSTRACT

In the spirit of educational reform, this paper discusses school restructuring and proposes a model for making education more responsive to the needs of urban youth by fostering competence built upon unique cultural resources and individual skills already possessed. The proposed project would target the middle school, which is considered an ideal starting place for structuring change because it is at this level that the gains of the elementary school are thought to be lost. The following structural changes are proposed: (1) redesign of the self-contained classroom; (2) professional diversification through the use of teachers as craftsmen, specialists, and artists; (3) the use of teaching teams; (4) the incorporation of group processing and problem-solving skills for both students and teachers; (5) a less hierarchical management structure; and (6) increased monitoring of performance through the use of advanced technologies. The three instructional strategies being considered are teacher-assisted instruction, team-assisted instruction, and computer-assisted instruction. The effectiveness of these strategies will be related to the core subjects of reading, mathematics, and science to assess academic achievement. (Contains 22 references.) (LL)

THE EFFECT THAT METHOD OF INSTRUCTION HAS ON ACHIEVEMENT IN CORE ACADEMIC SUBJECT AREAS

ROBERT G. THOMAS, PH.D.

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Abstract

The reform movement in education has been spurred by dialogue which suggest the failure of the American schools to perform their traditional role of responding to the immediate needs of society (Firestone and Corbett, 1988). Herein is proposed a model for restructuring which will provide a means for making education more responsive to those needs for the present as well as the future. These needs are viewed as economic as well as social. There has been an urgent call for educators to prepare today's youth for the immediate future. Reluctance or resilience toward responsible reform on the part of present-day practitioners results in the placing of new wine into old skins–an act that preserves the *status quo* but does little to improve choice, access, and educational opportunities for the majority of the nation's youth (Elmore, 1987). This proposal sets forth a radical design which is viewed as necessary if indeed the Great Experiment is to be extended to include education as the march toward progress continues.

Children and youth have always been the key to America's future. Now that America's future is clearly seen as inexorably tied to minority youth, it is time for educational leaders to address this critical issue.

With the support of funding agencies such as the Ford Foundation, this proposal may be possible. This proposal is designed to create and test a productive, efficient and just school model to meet the needs of America's urban youth and the broader needs of American society. It is the aim of this writer to direct a model school project that focuses on fostering competence in urban youth by building upon the unique cultural resources and individual skills already possessed. The target level of such testing is at the middle school. The middle school is an ideal starting place for structuring change in that it is at this level of schooling where the gains of the elementary schools are thought to be lost. The structural changes or restructuring of the middle school might include: (1) the redesign of the self-contained classroom; (2) professional diversification through the use of teachers as craftsmen, specialists, and artists; (3) the use of teaching teams; (4) the incorporation of group processing and problem-solving skills for both students and teachers, (5) a less hierarchical management structure; and (6) increased monitoring of performance through the use of advanced technologies.

Since competence is what is presumed to drive our politico-socio-economic system and 1/3 of our school age youth soon will be minority the moral and ethical implications, have become issues of survival. The survival of our free, libertarian, and democratic society, like urban youth, is at risk. The failure to provide competence, tools of survival, and access of opportunity for today's youth is to continue to act irresponsibly as a nation.

INTRODUCTION

A dynamic, progressive, and democratic society must be supported by a populous that has the capacity and is free and willing to participate in the dynamics of that society and to impact its institutions in positive rather than negative ways. The democratic concept of freedom is dependent upon that populous having the capacity to actively engage in the principles of free thought, free enterprise, and free choice. Freedom of thought, freedom of choice, and the free enterprise, as inalienable rights of that populous, carry the prerequisite of literacy (Kearns and Doyle, 1988; Pollrand, 1989). Therefore, for the principles of free thought and free enterprise to succeed in providing opportunities for freedom of choice, the populous must be educated and done so in the most efficient and productive manner possible.

The schools are the institutions in our society charged with the responsibility for providing access to literary capacity by providing a quality education which includes wide dissemination of what society values as useful and worthwhile knowledge. This study hypothesizes that present school structures lack the capacity to respond to the needs of today's cogno-technical society and subsequently need to be changed. Schools are unresponsive to new demands because they were designed to support the needs of an industrialized and mechanistic society. There can be little denial that these structures have been instrumental in carrying out their mission. However, schools face a new mission and must be redesigned now to include a vision toward present-day polities, economics, culture, and technologies.

Schools are faced with an imperative to establish and achieve greater production goals through efficiency, accountability to standards, and an

overall improvement in academic achievement. The purpose of this study is to determine what effects, if any, various instructional strategies have on learning measured through curriculum content and attitudes of significant others. The three instructional strategies being considered are (1) teacher-assisted instruction (TAI), (2) team-assisted instruction (Team-AI), and (3) computer-assisted instruction (CAI). The effectiveness of these strategies will be related to the core subjects of reading, mathematics, and science. Each core subject will consider the development of student social skills measured by change in student attitudes and behaviors. Independent of student attitudes, the change in attitudes of teachers, parents, and building administrators will be measured. While the major emphasis of this study will focus on instructional strategies, curriculum content, and learning, some attention will be given to adaptations made within the school environment to accommodate these programs. While many studies exist that incorporate content, and learning, some attention will be given to adaptations made within the school environment to accommodate these programs. While many studies exist that incorporate specific curriculum and instructional designs directed at measuring achievement, few include organizational design as a necessary adaptation. To address this need, the present study attempts to provide some degree of synthesis to these components for the purpose of examining organizational effectiveness. The organizational components considered in this study include the administration and management of organizational (1) goals, (2) structure, (3) systems, (4) curriculum and instruction, (5) induction and retention, and (6) client satisfaction. There is evidence to indicate that these are some of the critical issues with which schools are faced.

SUMMARY STATEMENT OF THE PROBLEM

The objectives of this study are concerned with the effects of several types of instructional strategies on curriculum and instruction, learning, induction, and attitudes of teachers, parents, and building administrators toward the program. The independent variable in this study is method of instruction. The dependent measure is curriculum (explicit and implicit). The explicit curriculum consists of the core subjects (i.e., reading, mathematics, and science), The implicit curriculum consists of social skills which include student attitudes and behaviors. Five levels of the independent variable will be tested. They are TAI only as control and combinations of Team-AI and CAI as treatment groups. The effectiveness of the explicit curriculum will be measured by recording scores received on reading, mathematics, and science tests. The implicit curriculum will measure student performance on social skills tests designed to measure changes in attitudes and behaviors. As an independent measure, the influence of significant others will be measured by the attitudes held by teachers, parents, and building administrators. These measures will be correlated using the appropriate scale. The target population selected for this study are junior high school children from randomly selected schools throughout the State of Ohio.

SPECIFIC PROBLEM AREA

More specifically the concern is to determine the effect that method of instruction has on achievement in core academic subject areas.

DEFINITION OF TERMS

The definitions referenced in this study focus upon teaching, learning, course content, and achievement. These four concepts, while related one to the other are also related to sociological factors as well as organizational components which also have an effect.

Teaching is described in this study as the art of establishing the proper fit between knowledge delivery systems and areas of course content in a natural environment where knowledge can be transmitted (Gagne, 1985). Therefore, in this study, the ultimate goal of teaching is viewed as the transmission of knowledge. Knowledge delivery systems and course content are the means of accomplishing this complex task.

Knowledge delivery systems are a means of transmitting valued knowledge from one individual to another individual or a group of individuals. Knowledge delivery systems include methods of instruction as well as course content. Methods of instruction include an array of possibilities. Some of these possibilities are listed. They are: computer-assisted instruction (CAI); directed discussion; discovery learning; educational audio visual aids; educational field trips; group instruction; instructional media; artificial intelligence; lecture method; lesson plans; textbooks; worksheets; Montessori method; mastery learning; motion pictures; non directed discussion; open classroom method; peer tutoring; programmed instruction; programmed textbooks; teaching machines; team teaching method; televised instruction; tutoring; videotape instruction; bilingual instruction; questioning; and individualized instruction. Each of these knowledge delivery systems is validated to varying degrees by dearth of research. The terms that will be used in this study include teacher-assisted instruction, computer-assisted instruction, and team-assisted instruction as independent variables. The dependent measure is curriculum which includes the core subjects, social skills, and attitudes of significant others. Organizational components which require some explanation are goals, structure, systems, curriculum and instruction, induction and retention, and client satisfaction.

Organizational goals include considerations for production, efficiency, and standards. It should be made clear that a school's organizational goals cannot be considered separate from the bottom-line regarding achievement–effective teaching and learning. Organizational structure relates to the broader issue of mission. The relationship between schools and society is considered in this context. An historical perspective is used in this regard to demonstrate the corollaries that have existed between the needs of society and the schools' response to those needs. Included in systems management are the notions of schools operating either as open or closed systems. Possible partnerships between business, industry, and community agencies are discussed in terms of potential support.

Course content in this study is limited to the three core ares–reading, science, and math. Learning is described in this study as the art of discovering the proper fit between knowledge retrieval systems and interests in an environment constructed so that knowledge may be efficiently retrieved. Thus, the ultimate goal of learning is the retrieval of knowledge. A proper match between knowledge retrieval systems and interests are the means by which learning may take place (Gagne, 1985).

Knowledge retrieval systems are a means of retrieving valued knowledge from one individual or collective. Knowledge retrieval systems are interactive with learning style as well as interest. Achievement as defined in this study is related to quality of teaching and levels of student mastery. Achievement is varied more or less depending simultaneously upon the quality of teaching and level of mastery. Simultaneous and optimum performance in these two areas constitute what is called excellence.

Sociological factors are defined in terms of external and internal influences. The external sociological factors, for teachers include the influence of peer teachers, building administrators, and the overall school culture. The external sociological factors affecting students include peer students, parents, and the home culture. Internal sociological factors which affect learning are described as attitudes, values, norms, morale, and satisfaction.

The organizational factors are described as the organization's goals, structure, and environment. Organizational goals are concerned with the organization's internal processes, its systems resources, and constituency satisfaction. Organizational structure includes organizational size and degree of formalization and/or centralization. The environment will be considered in terms of the task environment and the general environment (Daft and Steers, 1986).

HYPOTHESES

Achievement is influenced by quality of teaching and level of mastery in learning. When a proper fit exists between teaching and learning, there is a positive effect on achievement. To increase both quality of teaching and level of mastery, sociological and organizational components must be attended. Thy hypotheses in this study will reveal achievement has little to do with method of instruction or content and more to do with other factors. Three hypotheses will be tested. The null hypothesis in this study is that the treatment groups and control group will show no significant difference in achievement. The alternative hypothesis to tested is that the treatment groups and control group will differ significantly on achievement. It is further hypothesized that the control group will show a lower achievement level than treatment groups.

ASSUMPTIONS

The assumptions upon which this study is based are listed as follow:

(1) Given that–

- Method of instruction as a knowledge delivery system does not in and of itself affect learning.
- Content as a knowledge delivery system does not in and of itself affect learning.
- Method of instruction and content delivered simultaneously contribute to teaching effectiveness but do not necessarily affect learning directly.

(2) It would logically follow that–

- The learning style, as a knowledge retrieval system is not in and of itself affected by teaching.
- Student interest, as a knowledge retrieval system is not in and of itself affected by teaching.
- Leaning style and interest together contribute to learning but are not affected by teaching directly.

(3) Teaching and learning are influenced by other factors which include sociological, the organizational, and technological. Therefore, the following are also assumptions of this study.

- Both internal and external sociological factors have affects on teaching and learning. Internal factors impacting teaching and learning include attitudes, values, norms, morale, and satisfaction. The external factors include the influences exerted by peers, building administrators, and the school culture.

- Organizational factors which have an affect on teaching and learning relate to organizational standards of production and efficiency in both the general and the task environments. Most typically these factors relate to effectiveness and manifest themselves as organizational goals, structures, and systems.

- Technological sophistication of instructional media has a direct affect on both teaching and learning because of the way it manifests itself in the classroom. The classroom teacher has an array of delivery systems available for the dissemination and transmission of valued knowledge. These include, but are not limited to directed instruction, lecture-method, peer tutoring, CAI, individualized and instruction. It is assumed that present-day technologies are of sufficient enough sophistication to facilitate teaching and learning, while at the same time reducing costs and increasing production and efficiency.

- Teams, when used in conjunction with knowledge possessed about the nature of teaching, learning, technology, and the organization will produce significantly superior results in the area of achievement.

- Achievement increases in direct proportion to teaching and learning. By determining the degree to which these vary, one can observe levels of mastery and quality of teaching. Optimum performance on both teaching quality and levels of mastery translate into excellence.

(4) For any of the foregoing to be effective, organizational size, structure, and resources must be assessed and developed in sufficient enough proportions to support such a system.

LIMITATIONS

The study may not be possible without considerable commitment of technical, financial, and human resources from those who have a vested interest in the quality of the teacher-learner relationship. While the major emphasis aims to view teaching and learning environments, a more functional application would be to consider the school as a comprehensive unit. The availability of sufficient information on student interests and learning style is also a limitation of this study.

SIGNIFICANCE OF THE PROBLEM

While some educational technologists report that method of instruction results in no significant improvement in achievement levels (Clark, 1983). Others have disagreed with these findings (Petkovich and Tennyson, 1984). Here it is suggested that method of instruction be related to academic content and tested in the general environment if improved achievement for the purpose of increasing organizational effectiveness is the goal. Teaching and learning are complex and dynamic (Fullan, 1982). Method of instruction alone is not sufficient in and of itself to result in increased achievement levels. However, method of instruction, when coupled with

specific content and interrelated criterion will yield significant results. As a corollary, report after report suggest that teachers' creativity is limited by organizational components (Peterson, 1983). For the sake of internal and external validity many research experiments typically view teaching and learning in environments which are contrived and do not make allowances for the environmental influences on both teacher and learner. Many studies on teaching and learning attempt to achieve experimental isolation to control external and internal validity. One important issue to consider in this regard is that academic achievement and teaching effectiveness are related to the organization's goal (Daft and Steers, 1986). Educational institutions are constructed so that each locality maintains control over its schools (Council for Economic Development, 1985). This very fact contributes to the unique and diverse character of America's schools. In using Design 6, it is hoped that the proposed innovation will be delivered to students as a single natural package (Campbell and Stanley, 1963). There is evidence that funding support is available for such a study (Peterson, 1983 and Kearns, 1988).

REVIEW OF RELATED LITERATURE

Just as the schools of the late 19th-century were structured to accommodate an agro-industrial society and 20th-century schools were structured to optimize the economic effects of an industrial-scientific society, the schools of today require restructuring to continue the march toward progress and the creative economics of a scientific and cogno-technical society. Competition among individuals, schools, and cultures is not a new concept in American educational ideology. However, as schools are faced with the challenges of the 21st-century, educational alternatives that will yield the greatest benefits to America's youth in the most

productive and efficient manner possible must be considered. Increased productivity and efficiency are critical if America is to meet the challenges of tomorrow using its most prized resource–the youth in today's schools. The present system of eduction and prevalent business practices in the United States are often compared to those of the Japanese system in several ways. It has been reported that (1) the Japanese attend schools 240 days per year compared to 180 days in the United States; (2) Japanese businesses are structurally more flat or less hierarchical than the American counterpart and (3) Japanese schools concentrate on process skills (Kearns and Doyle, 1988). In American schools, while incorporating skills and process, there is considerably more value placed on standards which favor critical thinking and inquiry. To achieve these standards effectively, schools must begin to operate as open systems and take advantage of the many partnerships available for accomplishing the tasks at hand (National Governors' Association, 1986). Partnerships must be established and maintained among concerned business and community interests and education to increase the academic market share of America's youth through a technologically progressive education. No longer can America afford to teach yesterday's skills for tomorrow's technology. Education must be for the future. Advanced technologies are a part of that future. The technologies associated with this study have been designed to optimize instruction and learning of the core disciplines–reading, mathematics, and science. To accomplish this goal, TAI, team-AI, and CAI as instructional strategies, are viewed as mere tools that aid in the dissemination of specific knowledge as well as those skills and attitudes which form a basic first principle upon which the American experiment was designed to perpetuate–the democratic process.

It would have been unrealistic to have expected the one room school house, developed to accommodate the agro-mercantile society of the Puritan era, to contribute significantly to the industrialized society of America's progressive era or that of the Great Society (Naumburg, 1928; Kilpatrick, 1933; Vaughn, 1972; and Elmore, 1987). It is equally unrealistic to expect present-day schools, designed to accommodate industrialization and standardization, to make significant contributions to a cogno-technical society (Conant, 1962; Vaughn, 1972; Sizer, 1983; and Karier, 1986). In each technological era, schools have been structured to accommodate the prevailing technology of that period. The factory model caused schools to be structured to include an array of specialized classrooms with the teaching of specialized subjects having little or no apparent regard for learning as a holistic process. Synthesis was the responsibility of the student. Schools are now faced with yet another task–to restructure and provide students with the necessary tools which will accommodate synthesis for the present technology (The Holmes Group, 1986; National Governors' Association, 1986; and Kearns and Doyle, 1988). There is an imperative for constructive dynamic change not just reform, but a transformation–a restructuring (Sizer, 1983). Such a transformation or restructuring calls for an accompanying change in structure, technology, and the overall management of the school environment.

Related literature with top-down management schemes designed to alter the manner in which services are delivered to students is voluminous. Many of these schemes fall short partially because they fail to consider the unique relationship developed between the teacher and student. They also fail to consider the interaction of these critical players as they impact the

implicit and explicit curriculum. Restructuring must be concerned necessarily with the enhancement of this relationship if educational institutions are to be successful in meeting the challenges of education and the needs of today's youth as well as those of the broader society. Reform effort after reform effort report that when teachers are not involved in the critical decisions which impact the classroom, planned innovations fail. Several ethnographers cite cogent reasons for this apparent failure. Elmore (1987) reports that the proposed innovations are *incongruent* with what teachers perceive to be *practical alternatives* to instruction. Literature on teacher belief systems and attitudes toward proposed alternatives reveal two underlying themes which contribute to teacher apathy. These themes focus on the dynamics of control and uncertainty. The teacher seeks to reduce uncertainty by increasing classroom control. Areas wherein teachers report they are more certain are those areas that are closest to the classroom (Eisenhart, 1983). In the classroom, the teacher seeks to remain in control of the learning environment. And like other social entities, the teacher resists outside influence. While it is believed that control of classroom activities must remain in the classroom, the classroom structure, size, and environment must be altered to accommodate the increase in demand. To increase control and decrease uncertainty, teachers must be provided access to critical decisions which impact the classroom and availed of the necessary resources capable of aiding the individualization of instruction.

DISCUSSION

Presently, the most widely used method of instruction in education remains that of the traditional variety where a single teacher provides classroom instruction for an entire class of 20-30 students in a a self-

contained classroom (Glass, et al., 1982). In a self-contained classroom where a single teacher is used, the usual method of instructional delivery is that of lecture-demonstration. The use of small groups is the exception rather than the rule. Teachers, in these settings, most typically teach to the normal population and the needs of students on the two extremes of the normal-shaped curve largely go unmet. Widely disseminated delivery systems for special education and gifted education programs are testimonies to this practice. Additionally, individualization of instruction seldom, if ever, becomes a reality.

The use of teams in educationals settings has been receiving a great deal of attention. Teams in the medical and allied professions have provided a wide range of benefits. Teams are also used in business and industry as an organizing tool. Teams in educational settings have been promoted in a variety of models aimed at improving classroom teaching and instruction and consequently children's learning. The present use of teaming in the middle school is an exemplary concept worth investigating.

Significant improvement in cooperation, problem-solving, and critical thinking has been reported as contributing to the overall affect when using teams for collaborative consensus building (Argyris, 1962).

Advanced technologies have impacted every aspect of American and World culture. While most of these advances have had a direct affect upon business and industry, a similar impact is envisaged for the educational processes of teaching and learning. Many studies have been developed with just as many applications and report a wide range of successes as well as failures (Time, 1989). The time has come to take the risk out of education.

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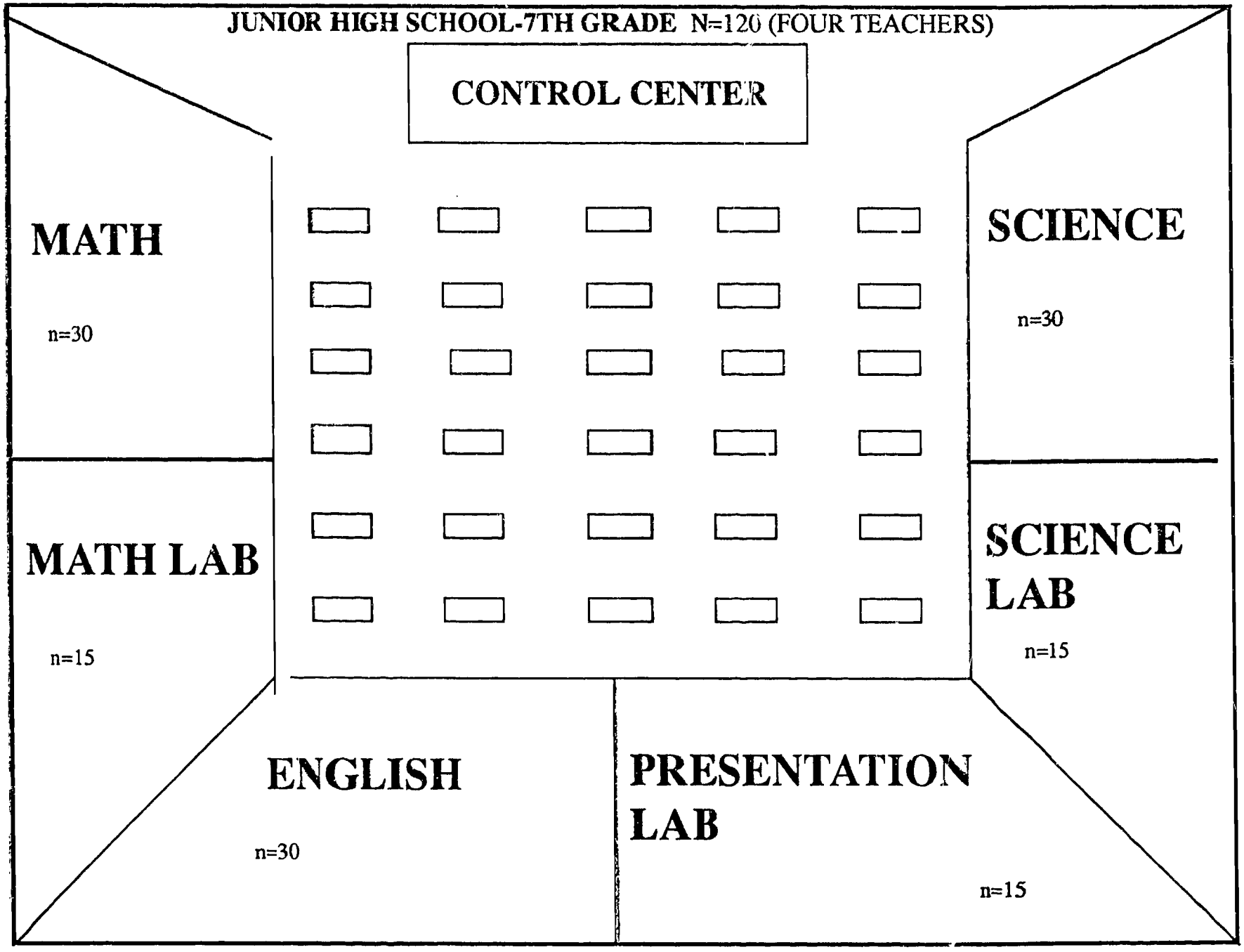
JUNIOR HIGH SCHOOL-7TH GRADE N=120 (FOUR TEACHERS)
CONTROL CENTER
MATH
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PRESENTATION LAB
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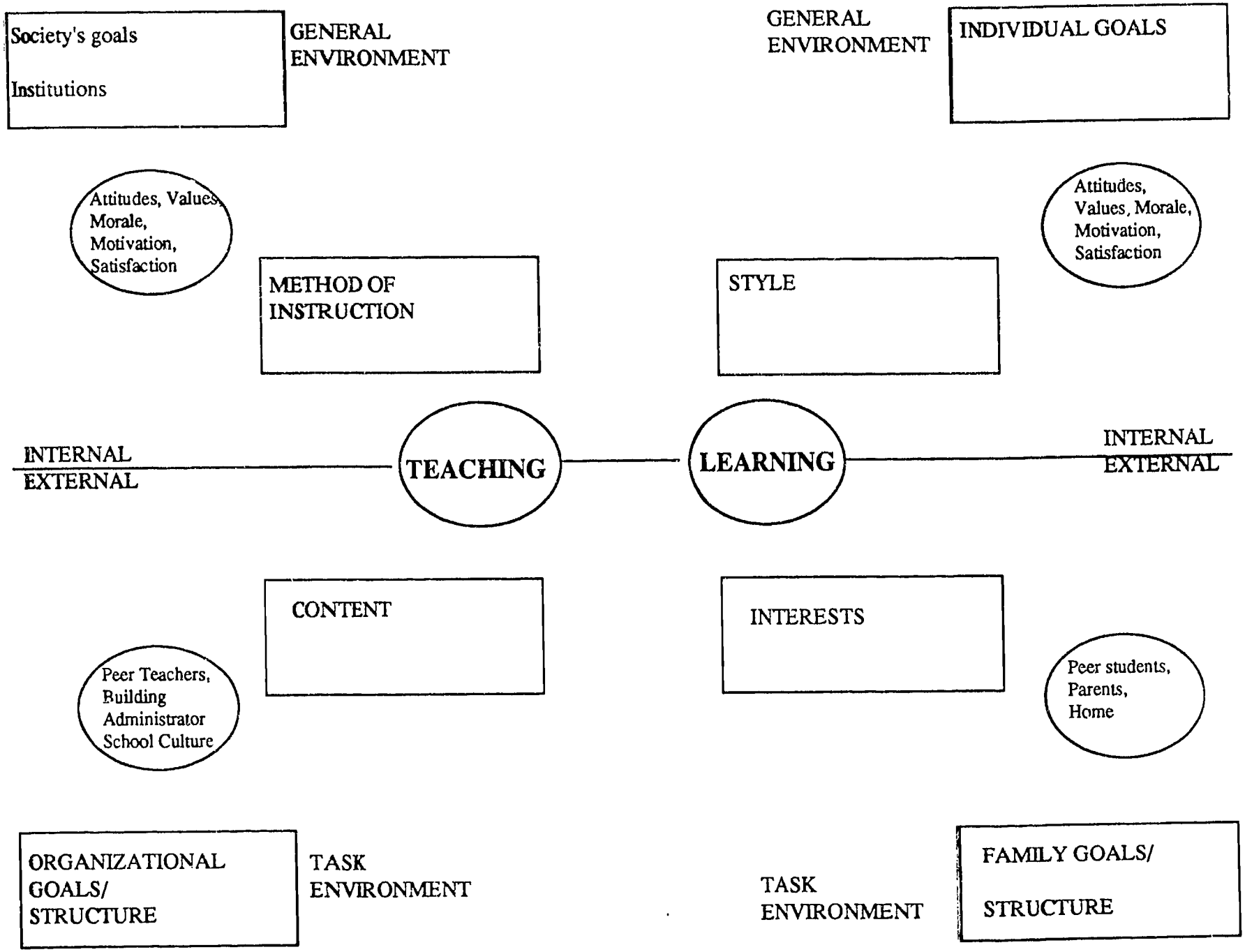
Society's goals
Institutions
GENERAL ENVIRONMENT
GENERAL ENVIRONMENT
INDIVIDUAL GOALS
Attitudes, Values, Morale, Motivation, Satisfaction
METHOD OF INSTRUCTION
STYLE
Attitudes, Values, Morale, Motivation, Satisfaction
INTERNAL
EXTERNAL
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EXTERNAL
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ORGANIZATIONAL GOALS/ STRUCTURE
TASK ENVIRONMENT
TASK ENVIRONMENT
FAMILY GOALS/ STRUCTURE