A CONCEPTUAL MODEL FOR MAP SKILLS

CURRICULUM DEVELOPMENT BASED

UPON A COGNITIVE FIELD

THEORY PHILOSOPHY

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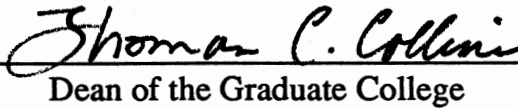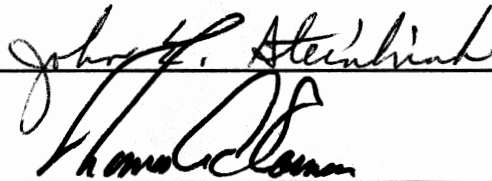the requirments for
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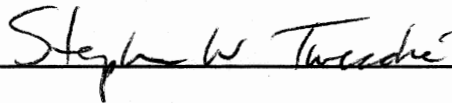DOCTOR OF EDUCATION
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PREFACE

I would like to express my most sincere appreciation to the faculty and graduate students of the Geography Department at Oklahoma State University. The support, friendship, and guidance has been an inspiration for which I am extremely grateful. I would like to thank Dr. Tweedie for his ongoing support. His concern for my best interests throughout my stay at OSU is greatly appreciated. Thanks also goes to Dr. Mathews for the integrity he has shown me during my doctoral program and as a teaching associate. Dr. Steinbrink deserves a special thanks for the insight he offered, particularly during the latter stages of the dissertation process. I would like to offer thanks to Dr. Hecock for his input and leadership during the early stages of the research. Thanks also goes to Dr. Karman for his advice and guidance, and for serving on my dissertation committee. Susan Shaull and Kim Cundiff deserve a note of thanks for their help and enthusiasm.

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iii

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

PROBLEM STATEMENT

Introduction

Public school education in America has undergone considerable criticism in recent years. Politicians, community groups, and parents are demanding that schools become accountable for the education of our nation's youth. Geographic education has been the recipient of a considerable portion of that criticism. The response by geographic educators has been substantial, aided by leadership and financing from the National Geographic Society. Map skills occupy a vital part of geographic education in elementary and secondary schools. Consequently, much of the response to the criticism levied at geographic education has focused on improving map skill programs.

An abundance of literature is available on the acquisition of map skills by students of all grade levels. Considerable attention has been directed toward student map and globe skill deficiencies.[1] These authors also express concern about the lack of improvement by our nation's students regarding map skill acquisition, despite the enormous amount of research on the topic. Over forty years ago Whipple and James noted: "instruction in map reading in the

elementary school is generally out of harmony with the facts of child growth and development".[2] Thus, there has been awareness of the shortcomings in map skill acquisition curriculum spanning the past five decades, with little indication of improvement. What has been done to address this issue?

A review of the research on the topic indicated the issue of deficient map skills curriculum and instruction has been addressed by reductionist methods: reducing it into variable component parts for analysis. Six component parts have been identified through the literature as contributing factors to map skill acquisition curriculum: 1) learning theory as it relates to map skill curriculum; 2) teachers' knowledge of map skills; 3) the demonstration base used in the classroom, including texts, related materials, and maps; 4) instructional strategies for imparting the curriculum; 5) supervision and coordination of the map skill curriculum, within and across grade levels; and 6) proper sequencing of map skills. Solutions to the map skill acquisition problem often address one, or combinations of these components, without regard for synthesizing the solutions within the context of a map skills curriculum. Why have these solutions failed to improve the acquisition of map skills by students? What does cognitive field theory have, as a philosophical base, to offer to possible future solutions?

Purpose of the Study

The purpose of this study is to develop and appraise a

conceptual model of curriculum development for map skill acquisition in grades kindergarten through eight based upon cognitive field theory. A cognitive field theory (commonly referred to as field theory) approach to education embodies educational principles such as a process rather than product orientation toward learning; focusing on the student's interaction with the environment; individualized and small group instruction; student empowerment; and more subjective modes of evaluation. Field theory has strong support from science, a point which adds validity toward founding curriculum design on its principles.

To base a curricular model upon an educational philosophy inconsistent with the prevailing philosophy in schools today certainly invites criticism. A subsequent purpose of the research is to suggest reasons why the prevailing philosophy, behaviorism, and other significant philosophical positions, have contributed to the lack of improvement in map skill acquisition among our nation's youth.

In order to develop the model a conceptual framework will be established and described based upon the first five contributing components to map skill acquisition. General map skill areas, established through a review of the literature, will be sequenced in a hierarchical manner and displayed according to grade levels. These sequenced skills will be integrated with the conceptual framework to form the conceptual model for this dissertation.

A subsequent purpose of the research is to evince ways the

conceptual model can be implemented within our nation's schools. To accomplish this purpose the model and scenarios will be developed to demonstrate application of the conceptual model at the classroom level. Scenarios will include practical examples for teaching specific skills at selected grade levels. The conceptual model will then be compared with nationally recommended curricula to indicate areas of similarity and incongruency.

Justification for the Study

Despite the research and demonstration base, there is persistent evidence that this nation's students are poorly prepared regarding map skills and the general field of geography.[3]

Miller's statement suggests the existence of a gap between research, generally associated with universities, and practice, associated with the curriculum and instruction being implemented by educators in public and private schools. Map skill deficiencies exhibited by students for the past five decades are partially a result of this gap between research and practice. Research supports this contention, indicating that increased resources and knowledge have failed to improve student performance in the area of map skill acquisition.[4] Why does the gap exist, and what can be done to improve the transfer of research efforts to the practical realm of our schools?

A review of the literature suggests that map skill acquisition is likely to decline. Mehlinger indicates that a possible standardization

of exams on a national level could impel teachers to rely upon commercially produced texts and materials which can better prepare students for the sole purpose of passing the tests, rather than the learning and application of skills.[5] He states that our nation's continuing preoccupation with accountability may have a negative impact on map skill education; higher level thinking skills, problem solving, and high interest content may be of secondary importance, as teachers seek to prepare their students for examinations.

A gap appears to exist between the wealth of research in the area of map skill acquisition curriculum and subsequent implementation of that research at the classroom level. This gap also appears to be a contributor to the map skill deficiencies depicted in this chapter. There is evidence that the problem may be intensifying due to nationwide trends toward accountability through standardized examinations. Theorists complain that research is not being implemented at the classroom level while teachers, who are responsible for imparting curriculum according to their own value system and range of expertise, find little time to conduct the implementation.

Reductionist approaches to research in the area of map skill acquisition and related topics have contributed to the gap between research and practice. Researchers, in many instances, who have focused on component and subcomponent analysis of the map skill curriculum have neglected to effectively integrate their findings into

a framework for implementation. The result is a wealth of completed analysis with little emphasis on bridging the research to practice gap; demonstrating how their research could be synthesized within the curriculum in a practical and appropriate manner. Overburdened classroom teachers continue to pursue their own agendas, scoffing at research which falls significantly short of meeting their practical daily needs. Diligent researchers pursuing answers to curriculum shortcomings offer theoretical solutions with little regard for application at the practioner's level. As the gap continues to grow between research and application, map skill acquisition by our nation's youth continues to suffer. A central theme of this research suggests that the responsibility for bridging this gap between research and practice lies with the researcher.

The need for a practical map skill acquisition curriculum based upon the wealth of research and material available is significant. Integration and application of the substantial research base within a cognitive field theory philosophy will help reduce the gap and improve student performance on map skill acquisition by individualization of the curriculum and changing the role of the teacher from imparter of knowledge to facilitator of learning. Strategies for implementing such a model in a realistic and practical manner are also needed to bridge the implied gap between theory and practice. Successful completion of this study will fulfill these tasks and, hopefully, meet significant needs for readily applicable

theory at the practitioner's level in grades kindergarten through eight.

Organization of the Dissertation

To accomplish these purposes a rationale for basing the curriculum in cognitive field theory will be developed. Secondly, past and existing map skill curriculum research will be reviewed by analysis of the contributing components described in this dissertation. The analysis will include research on the topic from the fields of geography, cartography, education, and psychology, with the intent of identifying input to an applicable conceptual framework. The results will indicate explanations for the persisting map skill deficiencies assessed in this study, and possible solutions to the dilemma.

A conceptual framework will be developed that is comprised of the five identified contributing components (1. learning theory as it relates to map skill curriculum; 2. teacher's knowledge of map skills; 3. the demonstration base used in the classroom, including texts, related materials, and maps; 4. instructional strategies for imparting the curriculum; and 5. supervision and coordination of the map skill curriculum, within and across grade levels). Proper sequencing of map skills, the sixth contributing component, will be integrated with the framework and applied to specific classroom and general instructional situations to form the conceptual model. Integration of the components will be addressed, along with applicability at the

classroom and building levels. The model will then be appraised in regard to philosophical congruency, educational viability, and other possible entanglements to ensure practicality and feasibility of success at the classroom level.

Comparisons will be made between the model and selected national curriculum recommendations. The intent is to delineate incongruencies between the model and the selected curriculums. The final chapter will consist of a summary of the study's results, and a conclusion regarding the significance of the study and possible areas for further research in the field.

Endnotes

[1]Roger M. Downs, Lynn S. Liben, and Debra G. Daggs, "On Education and Geographers: The Role of Cognitive Developmental Theory in Geographic Education," Annals of the Association of American Geographers 78(4) (1988): 680-700; Michael L. Hawkins, "Map and Globe Skills in Elementary School Textbooks," Journal of Geography 76 (1977): 261-265. A. David Hill, "The Western PLACE Conference: Teaching Models For the Renaissance of Geography," in Placing Geography in the Curriculum: Ideas From the Western PLACE Conference A. David Hill. (editor). (Boulder: Center for Geographic Education and the Colorado Geographic Alliance, 1988) 1-5. Duane M. Giannangelo and Bruce M. Frazee, "Map Reading Proficiency of Elementary Educators," Journal of Geography 76 (1977): 63-65; Donald O. Schneider, "The Performance of Elementary Teachers and Students on a Test of Map and Globe Skills," The Journal of Geography 75 (1976): 326-332.

[2]Gertrude Whipple and Preston E. James, "Instructing Pupils in Map Reading," Social Education 11 (1947): 205-208.

[3]Jack W. Miller, "Teaching Map Skills: Theory, Research, Practice," Social Education 49 (1985): 32.

[4]Downs,Liben, and Daggs; Anne Geissman Canright, "Elementary School Cartographics: The Creation, Use, and Status of Social Studies Textbook Maps," diss., U of California at Los Angeles, 1987; Schneider; Monique Laurendeu, and Adrian Pinard, The Development of the Concept of Space in the Child (New York: Houghton-Mifflin Co. 1964); Whipple and James 205-208.

[5]Howard D. Mehlinger, "American Textbook Reform: What Can We Learn From the Soviet Experience?" Phi Delta Kappan 71 (1990): 29-35.

CHAPTER II

BACKGROUND TO MODEL DEVELOPMENT

The purposes for this study are to: 1) develop and assess a conceptual model of map skill curriculum for grades kindergarten to eight based upon cognitive field theory; 2) suggest reasons why prevailing educational philosophies have contributed to the lack of success in student map skill acquisition; and 3) to indicate ways the conceptual model can be implemented within our nation's schools.

To accomplish these purposes a review of educational philosophies and their applications to school curriculum was undertaken. A case will be made in this chapter that past educational philosophies have negatively influenced map skill curriculum and instruction in grades kindergarten through eight. Once the case is established, an argument for cognitive field theory as a philosophical base for map skill curriculum and instruction will be developed.

Following the establishment of the model's philosophical base, explanation and review of the six identified contributing components to map skill acquisition will be undertaken. These components include: 1) learning theory as it relates to map skill curriculum; 2) teachers' knowledge of map skills; 3) the demonstration base used in

the classroom, including texts and related materials; 4) instructional strategies for imparting the curriculum; 5) supervision and coordination of the curriculum; and 6) proper sequencing of map skills. A section of this chapter is devoted to each component, including literature reviewed from the disciplines of geography, cartography, education and psychology.

Philosophical Base and Curriculum

The most important factor in curriculum development and application is the individual classroom teacher. Teachers make continual curricular and instructional decisions in their classrooms which are based on their personal values and their educational philosophy. Rarely are these continual decisions questioned in the practical setting. Personal experience indicates that during the course of a typical school year, a teacher may be observed and/or evaluated by a superior for an amount of time often less than two hours. In many instances one-half of the observed time is prearranged, to allow the teacher ample time to organize instruction in a manner conducive to positive evaluation.

Time constraints and responsibilities have forced administrators to limit their classroom contact time with teachers, thus removing administration from their assumed role as instructional leader within the schools. With lower degrees of administrative-induced accountability for what occurs within the classroom setting, teachers are freer to pursue curriculum implementation with few constraints.

To effectively develop and implement curriculum, educators must take into account the significant role the teachers play in the schooling process. Decisions made by teachers, based upon their values and educational philosophy, will supersede curriculum recommendations from outside the classroom in most instances. Therefore, a vital component of curriculum development must include a rationale for selling teachers on the importance of understanding their educational philosophy as it relates to the curriculum they impart. Any efforts to change individual teacher philosophy must take into account that motivation for change, from a field theory perspective, is a phenomenon internal to the learner.[1] Change becomes an educational endeavor based upon: an understanding of various philosophies; self identification of where the teacher philosophically exists; the impact of that individual's philosophical position on the curriculum and instruction within the classroom; and the realization that the particular status quo philosophy is incongruent with the desired educational process. These understandings are followed by an internal desire to transform in a self-determined, suitable manner. If resulting change is congruent with the teacher's values and school's educational goals, then success is possible.

Philosophical Congruency

The general importance of philosophical congruency in teaching

and curriculum development is discussed in the literature.[2] Dobson asserts that teachers' values and beliefs form the foundation of the decisions they continually make.[3] He contends that most teachers maintain an incongruent educational philosophy, manifesting probable inconsistencies between what they believe and what they do. Such inconsistancies can have detrimental effects on the curriculum and instruction within their classrooms. Teachers must reflect a consistent educational philosophy regardless of instructional methods used in order to maximize their teaching effectiveness.[4]

Incongruent, or eclectic philosophies, exist among teachers who internalize and implement values and beliefs from a variety of different philosophies.[5] Such conflicting values and beliefs can cause confusion for parents, students and peers within the schooling process.[6] If, for example, a teacher explains to parents and students that their primary goal is to help the individual students reach their maximum potentials, but evaluates and grades according to standardized, objective examinations, then a mixed message is being delivered. Parents and students would learn quickly that individualization is not valued in that classroom, and that for each student to gain "good" grades they must master an identical curriculum.

Teachers without a consistent and congruent philosophy show little evidence of long range planning in their teaching, and are prone to burnout.[7] If teachers believe in individualization of instruction, but are forced to use methods against their beliefs, the incongruency

between belief and practice will cause severe conflict and possibly burnout.

Table 1 shows a brief analysis of the characteristics of four common educational philosophies. These philosophies, or combinations of these philosophies as in the case of eclecticism, have dramatic influence on the curriculum imparted in our schools. A brief review of Table 1 will indicate possible problems teachers may encounter as they maintain, or are forced within an eclectic educational philosophy. Teachers with humanistic values, who believe that mistakes are learning experiences, will encounter severe problems in a school administered with a mental discipline philosophy. If forced to teach in a way incongruent with their beliefs, teachers will suffer and send mixed and confused messages to their students and community.[9]

Further analysis of Table 1 indicates the significant differences between the philosophies, particularly in some areas such as curriculum. Since a purpose of this study is to suggest reasons why prevailing educational philosophies have contributed to the lack of success in student map skill acquisition, an argument will be developed here which depicts why the mental discipline, behavioral and humanistic approaches have not helped to solve the problem. While the majority of educational approaches in schools today are eclectic, an approach whose negative attributes have previously been described, a discussion of mental discipline, behavioral and

TABLE I

CHARACTERISTICS OF SELECTED EDUCATIONAL PHILOSOPHIES [a]

Characteristic	Mental Discipline	Behaviorism	Cognitive Field	Humanism
1. Moral nature of people	Bad	Neutral/ passive-reactive	Neutral/SMI	Good
2. Personality of learner	evil/corrupt	None: all character is learned	Curious/ Problem solver	Humane
3. Goals of learning	Externally preordained	Set by society	Jointly determined by learner/teacher	Totally internal
4. Impetus for learning	Guilt/fear of punishment	External reinforcement	Interest/curiosity/ negotiation	Interest/ curiosity
5. Nature of truth	Transcendental	Empirical	Conditional	Immanent/ personal
6. Purpose of education	Curb bad impulses	Learn specified curriculum	To function in a problem filled society	Develop personal truth
7. Teacher's role	Authority/ punisher	Behavior shaper/designer of instruction	Facilitator	Arouse curiosity/ interest
8. Curriculum	Secondary to disciplining the mind-classics	Teacher selected, linear- sequential	Problem centered/ negotiable	Student selected
9. How information is acquired	Rote memory/ drill	Responses reinforced	Discovery leading to insight	By doing
10. View of mistakes	Moral backsliding	Non-reinforcing events	Part of learning/ natural consequences apply	Learning experience

[a]David S. Lane, Jr., and Kay Sather Bull, Learning Theory: A Practitioner's Approach (New York: Forthcoming, to be published by Harper and Row Publishers, 1991).

humanistic approaches as applied to map skill curriculum and instruction will improve the argument for cognitive field theory.[10]

Mental Discipline Philosophy

In the mental discipline philosophy, as applied to map skills education, learning map skills would be subservient to learning the classics. The learner's role would be to memorize maps, place locations, and those map skills necessary to better understand the classics. The mere knowledge of those skills as learned within the confines of the classics, would allow the learner to apply those skills to new situations as they arise. Consideration for learners and their unique perspectives, abilities and qualities would be of no concern, for all learners should be subjected to the same curriculum and in the same manner.

Teachers theoretically based within a mental discipline philosophy function as authority figures and imparters of the curriculum, which places those teachers in an arduous role: they must have all the knowledge necessary to direct the instruction within the classroom. Current research clearly indicates that in the area of map skills instruction few teachers have the necessary knowledge to be placed in this demanding position.[11] As the wealth of knowledge continues to increase in geometric proportions, the possibility of training enough teachers sufficiently is unlikely.

Proponents of the mental discipline philosophy would argue that map skills are ameliorative and applied skills which can be easily

learned outside the classroom as the need arises, especially if the learner has a sound background in a core curriculum founded in transcendental knowledge.[12] If forced to teach map skill curriculum, the mental discipline based teacher would resort to drill and practice along with memorization. The love of maps, the application of map skills to students' lives and problem solving, or adjusting the map skill curriculum to meet individual and diverse needs would be of no concern. After all, students are evil and knowledge must be drilled into their minds with threats of punishment.

I have never witnessed a congruent mental discipline approach to education by a teacher or administrator. I have often witnessed eclectics with some mental discipline characteristics. The arrangement of desks within a classroom, typically all in neat rows facing the teacher's podium, is a classic example of a mental discipline influence in our schools. Memorization of map facts and places is still a common method for imparting a map skill curriculum and also reflects the mental discipline approach to education. If memorization composes the entire or majority of the map skill curriculum, as it does in many schools, then the acquisition of higher order thinking skills will certainly suffer.

Mental discipline contributions to map skill curriculum and instruction has certainly contributed to map skill deficiencies in our nation's youth. The literature indicates that mapping curricula rarely

reflect research on cognitive spatial abilities and developmental capabilities.[13] Further study indicates a lack of application of map skills and knowledge to the learner's world.[14] Map skill curriculum must attend to the individual needs of students, as clarified through an understanding of cognition and developmental psychology. The mental discipline approach to learning shows no evidence of concern for the individual abilities of learners and has therefore contributed to the poor condition of map skills programs in our nation.

Behavioral Philosophy

The behavioral philosophy of education is theoretically based in Newtonian Science.[15] A theme of Newtonian Science is the ability to reduce beings and events to explainable, predictable and mechanistic phenomena. God is perfect and he makes perfect things. Therefore, all things have an order. Behavior in this mode is explainable and predictable in terms of cause and effect. This emphasis on the ends-means relationship is best exemplified by the mechanized reproductions of animals' physiologies as depicted in the seventeenth and eighteenth centuries. Gough states that "It should be clear that any educational theories that derive from eighteenth-century conceptions of the physical universe should be treated with considerable caution."[16] He prefers that educators base their philosophy upon more modern scientific theory such as quantum mechanics and the type of time-space continuum envisioned by Einstein.

A simple explanation of the behavioral philosophy indicates a lack of concern over internal processes within learners. Only what is empirical is valued, because it can be observed while the internal processes of a human can not. The behaviorist knows that any behavior can be evoked given the proper stimulus. Brain-washing is a common example of behaviorist actions taken to the extreme. Guilford contends that "Behaviorism's efforts to account for all behavior solely in terms of stimulus-response sequences have definitely made their contributions, but this approach has been able to go only a limited distance. It is becoming more generally recognized that organisms actually create their own effective stimuli."[17] The limitations of behaviorism also include the reliance on explanation of phenomenon entirely in terms of analysis of its parts, a reductionist approach.[18] Critics of behaviorism view the whole as being greater than the sum of the parts, and prefer to concern themselves with the myriad of complexities the individual learner brings to the learning environment.[19]

Schools in the behaviorist mode have a factory type of atmosphere, where children are raw material to be formed into products which can contribute to society. Teachers in this scenario are shapers of behavior. When desired outcomes are not obtained from particular students, then task analyses, remedial programs, behavioral modification, and/or other curative steps are pursued until the desired outcome is realized. Motivation for learning is an

external phenomenon, with teachers providing the proper stimulus to get the desired response.

The curriculum for the behaviorist is a linear-sequential program. Each learner is expected to succeed within the same program. Inevitably this involves focussing on the textbook as the source for content and instruction. Curriculum objectives are written in an outcome based manner and are often referred to as behavioral objectives. The curriculum is drawn from a series of measurable behavioral objectives, often determined by objective examinations.

Map skill curriculum would be taught in a step-by-step process for all students within the group. This instruction usually takes place as part of the reading or social studies curriculum, typically coinciding with a textbook. The emphasis on textbooks, which are generally written for large market areas, makes the transfer and applicability of knowledge to the learner's immediate environment more difficult. The motivation for learning the material is externally applied by the teacher. Rewards are given for mastering material and incentives are offered as a means of instigating the learning process. The behaviorist's view of students as passive learners purports a classroom climate where each student is enticed to complete an identical curriculum, and to be subjected to identical evaluations.

Teachers' evaluated within this philosophy learn to "teach to the

test" so that their students will master the desired material and perform admirably on the assessments.[20] Students taught within this philosophy learn to focus on that material which is necessary to perform well during objective evaluations. Lower level thinking skills become emphasized at the expense of higher order skills such as application, synthesis and evaluation.

Finally, a primary reason why the behaviorist approach has failed to contribute positively to map skill acquisition is the disregard for individual traits and abilities. When teachers from a behavioral mode impose a scope and sequence upon whole classrooms and expect each child to meet minimum criteria of behavioral objectives, many slower students become lost while advanced students may be bored. Children are not all at the same developmental level, nor are they from the same environment with the same experiences and opportunities. In the world of the behaviorist, little effort is spent on the unknown internal processes involved in learning material. Special education and Title I classes are available for those children who are unable to master the intended material within the regular classroom. Because of a lack of funding, gifted and advanced students who are bored by the slow pace of the curriculum may become complacent and perform well below their capacities. Creativity within this mode is also deemphasized, a point which has strong negative implications for map skill applications within problem solving situations.

Humanism Philosophy

The basic components of humanism as an educational philosophy involve the innate goodness of the learner, individualization of education, and student selected curriculum. Humanists believe that if given a choice students will choose appropriate curriculum to study, thereby increasing motivation and interest, and enhancing the learning process.[21] In practice there are few examples of this philosophy toward education so aptly recommended by educators such as Dewey and Macdonald. Montessori education may be the closest example of a humanistic approach in this country.[22] Montessori education is most commonly found in early childhood education and primary grade levels, but typically outside of the public school setting.

A teacher whose philosophy is based in the humanistic school of thought would devote a tremendous amount of time to organizing the classroom for experiential and exploratory learning. Students would enter the classroom and be exposed to a variety of well planned and high interest activities designed to help the child develop their personal potentials.

A map skill curriculum taught from this perspective would involve a variety of activities designed to help the child explore, use and internalize various map skills experientially. If children choose not to work on map skill related activities then they would not do so. Humanists believe that given freedom learners will make good

choices. They also believe that young children are excited about learning, and will normally choose to explore a wide variety of phenomenon with a high degree of learning and motivation. Humanists argue that prevalent philosophies which depict children as either bad or neutral, create non-motivated students with accompanying low levels of learning.

Opponents of humanism argue that not all children will choose the right decisions within the expectations of schools and society.[23] They refuse to accept that the goals of learning are totally internal, and demand some type of accountability. The best argument against humanism alludes to its misuse. Great humanistic teachers tend to be great, while poor humanistic teachers tend to be very poor. Such misapplication of the philosophy to the classroom has been found to be prevalent, a point which has brought about much negative publicity in respect to this approach toward education.[24]

While good points appear to exist, it is unlikely that schooling and curriculum based upon humanism's characteristics is salable, or viable in today's society. How can the best characteristics of humanism be modified and applied to education in a manner conducive to success? I believe the answer lies in cognitive field theory.

Cognitive Field Theory

The philosophical base chosen for this research is cognitive field theory (or field theory). Cognitive field theory examines behavior as

a function of a person interacting with the environment.[25] People have individual histories, traits and perceptions, which affect how they will interact with the environment.[26] Lane and Bull contend that a simultaneous mutual interaction occurs between a person and the environment causing change for the person and the environment, as well as the person's perception of the environment.[27] The emphasis on simultaneous mutual interaction has significant overtures for the school setting. The individuality of the learner indicates, according to field theory, that learning should be individually organized, with the student having some input into what will be learned and how it will be accomplished.[28] The authors further state that learning is accomplished "through purposive involvement in problem finding and solving. Insight is the outcome of learning."[29]

Motivation for learning within a field theory philosophy is an internal process where teachers: set the stage for learning to occur; help the learner as needed; lend support for trial and error learning; and emphasize small group and individual instruction.[30] "Generally speaking, the gestalt-field theorist, thinks of learning as an attempt to reduce tension, or to restore equilibrium, through gaining insight into the solution of a problem."[31] Teachers must try to emphasize the whole before considering the parts, and to drill only when deemed necessary.

Cognitive field theory emphasizes a process approach to

education. Evaluation is less a summative operation in field theory, and can be shared or given to the student, thus becoming a formative phenomenon. Evaluation, congruent with this philosophy is less objective and standardized, and relies on more subjective and time consuming processes. Instead of a focus upon the acquisition of specific skills, education must fixate on learning structures and how they are related, thus developing general understandings of knowledge which can be applied to a wide range of situations or problems.[32]

Hergenhahn associates field theory with Gestalt psychological theory. "The content of thought (consciousness) comes to us already organized; it is organized by the brain before we experience it or as we are experiencing it."[33] He states that field theorists view man as an active participant with and in the environment, with change occurring for both as a result of interactions (as in the case of simultaneous mutual interaction[34]). He also views learning as a facilitated, rather than directed, phenomenon, especially when evoking the application of higher order thinking skills.[35]

Brown believes that most current curricular and instructional applications are centered in Newtonian Science and its associated behaviorist philosophies.[36] He feels curriculum and instruction must undergo significant change toward a philosophical base in line with modern scientific thought, particularly quantum mechanics and the work of Ilya Prigogine. Such a change would impel schools to

become more process oriented and people centered, and less mechanistic and deterministic.[37]   Both the new science theories mentioned by Brown and supported by field theory encompass philosophies which emphasize or allude to individualization of education in an effort to assist students to reach their maximum potential.

The application of new science to education, relies heavily upon the work of Prigogine and Stengers.[38]   Conclusions regarding curriculum based in the new science indicate strong association with cognitive field theory. Doll argues that such a curriculum would: emphasize the internal organizational and structuring attributes of the individual student; allow time for spontaneity; have loose structure, allowing for student input toward alternatives and insights; and increase student involvement in the planning and evaluation procedures.[39]   He views the relationship between teacher and student as a sharing one, with each learning from the other. Doll contends, "In this matrix, places where one begins and ends are far less important than how well one explores the myriad connections, logical and personal, inherent in the matrix. In regard to daily lesson plans the focus would be not on closure but on flexibility for alternative yet productive pathways. Lesson plans would be designed to provide enough disequilibrium that students would develop their own alternatives and insights."[40]

Doll addresses the works of Jean Piaget, and believes that Piaget was misinterpreted by the behaviorists, stating that a Piagetian

curriculum can not be developed within a behaviorist framework.[41] This argument has significant ramifications for map skill curriculum and instruction, considering that most map skill research and implementation strategies are based on Piaget's work, and is imparted in a behaviorist or traditional mode. "Man was now seen to be, and always would be, one step removed from the phenomena of the world. The interfering medium, of course, is man's own human constraints."[42] Doll's quote indicates the importance of man's interaction with the environment in the learning process. The individuality brought to the environment which is manifested by man's human constraints, typifies man as an active agent in the learning process, a point supported by field theory and rejected by behaviorists.[43]

Schwartz and Ogilvy assert that complexity and unpredictability in our world will cause us to develop more reliance on human processes and development. Because of the chaotic nature and complexity of humans and their environment, it becomes virtually impossible to predict behaviors and actions of individuals.[44] Applications of their work to education seem innumerable. Most significantly is the need to individualize instruction and curriculum, and assist each student in those processes which will help them function successfully in an ever changing and unpredictable world. Forcing every child through an identical curriculum in preparation for statewide or nationally standardized examinations, despite their

unique and individual characteristics, is behaviorist in nature, and inconsistent with the demands of our current society. Each child is unique and brings different traits to the schooling system. Schools should assist the educational process for each student dependent upon the history and traits of the student in order to maximize the potential of the individual.

Evaluation is the most powerful entity in our educational system today. It determines our curriculum and instructional strategies; for when schools increase their emphasis on test scores from standardized examinations, it becomes more and more necessary for teachers to prepare their students for those exams. In this scenario teaching to the test takes precedence over problem solving and critical thinking skills. Objective and summative evaluation is also deeply steeped in the behavioral school of psychology, a school perpetuating the standardization of American education. Field theory, on the other hand, humanizes the schooling process and deemphasizes evaluation, especially from an objective and summative perspective.

Summary

> Therefore it is incumbent upon educators to begin gravitating toward a philosophical position that will assure each student the opportunity to be that which he always should have been in the teaching/learning process - a producer, contributor, creator and consumer.[45]

This section of the literature review has attempted to identify

the need for establishing a congruent philosophical base for undertaking the research for this dissertation. Secondly, an attempt has been made to support cognitive field theory as the philosophical base, a philosophy contrary to other reviewed theories impacting our schools today.

The application of field theory to the development of a conceptual model for map skill acquisition has significant overtures for the dissertation. As the model will focus on a student-centered individualized curriculum, and means for instructing that curriculum, each of the contributing components will be affected. Because of the contradictions between field theory and the dominant philosophies impacting schools today, the model developed as a result of this research will offer a significant and contrary prescription. Therefore, strategies for implementing the prescribed model will receive considerable attention in the dissertation.

The research has indicated strong support for field theory based curriculum and instruction in education. Recent research has been cited from geography, education and psychology to support the decision to utilize this theory as the philosophical base for this dissertation. Perhaps more importantly, research has been cited from the sciences indicating application of new science to education and general support for cognitive field theory based educational philosophy. Collectively, support has indicated that field theory is a growing force in education. The need to prepare children for an ever

changing and unpredictable world demands schooling which focuses on process and the positive nurturing and growth of unique individuals in our school systems.

Contributing Components to Map Skill Acquisition

The six contributing components were derived primarily from the work of Muir.[46] She identified four educational problems associated with map skill acquisition: "the nature of commercial maps used in schools; teachers' inability to use maps; poor instructional practices; and curricular issues related to limited scope and sequence."[47] Scope and sequence was adjusted to encompass coordination and supervision of the map skill curriculum. The nature of commercial maps was expanded to include the demonstration base used in the schools including texts. Two components were added to Muir's list of four components: learning theory as related to the map skills curriculum and the proper sequencing of skills. These additions are substantiated in the literature.[48]

Learning Theory

The learning theory component of the conceptual model involves psychological aspects of how knowledge is learned by students in the classroom. An established scope and sequence of map skills for schools can not be effectively created and imparted without consideration for how students acquire and structure new information. This section will address how kids learn new

information, and how awareness of this process by educators can contribute to the conceptual model.

Downs, Liben and Daggs expressed the need to integrate ideas from geography, education and child development in order to evoke successful reform of geographic instruction in our schools.[49] The authors examine Piagetian theory as a theoretical structure for developing curriculum and instruction in geographic education. Despite a detailed explanation of young children's map reading abilities and the suggestion that other psychological theories (the theories of Bruner and Vygotsky) have much to offer in terms of educational reform, the authors appear to be too ends-means oriented in their prescriptions, calling for better structuring of materials and curriculum, and placing less heed to the internal and unique structures of individual learners.[50] Their explanation and adaption of Piagetian theory to map skill education is well conceived, but does not address criticisms leveled toward applications of Piagetian theory by other researchers.[51] The concern of these authors alludes to problems associated with the strict levels of Piaget's stages of development and the applications of those levels to map skill education.

An abundance of geographic literature addresses the issue of Piagetian stages of development, particularly in the area of when particular skills can be introduced to children.[52] Blades and Spencer contend that three year olds can use maps to locate places, and children at the age of four and one-half can use a map to follow a

correct road.[53]   They further state that such findings are contrary to psychological research which dominates traditional learning theory. Bluestein and Acredolo, in experiments with children aged three to five, found that while three olds had difficulty inferring position of an object after rotation of the associated map, five year olds were generally successful.[54]   The authors conclude that all the children in the study displayed map reading skills typically assumed to be beyond their level or stage of ability.

A study by Savage and Bacon involving two groups of first graders in Seattle, focused upon teaching map skills through abstract and concrete means.[55]   The authors discovered that no difference existed between the two groups and their respective abilities to learn the skills involved.   They concluded that first grade children are able to begin study of map skills at a more abstract level than was previously assumed and supported through psychological research.

Downs states that: "Cartography is a 'natural' way of thinking. The use of spatial expressions is fundamental to the structure of language and thinking."[56]   He believes that a child's map should be viewed as a legitimate source of data, a manifestation of the child's perspective of a representation of a reality.   Identification of the meaning of maps, and what they represent to map readers and map makers, is central to this research.   Essentially it is deriving meaning from print, which is a basic goal of reading curriculums.   This relationship to reading has strong implications for this study.   Winn

believes that maps convey meaning in many ways, with the purpose being to make the usually confusing concrete world more abstract and less ambiguous.[57] The lack of a "bridge" between the concrete world of the child, as manifested by their representation of that reality, and the abstract world of maps is where the communication problem exists. Solutions to improving the bridge between concrete and abstract, and between map reader and map maker, must consider the age and individual developmental characteristics of the reader.

Eastman discusses the difficulty of structuring a common cartographic language as an aide to improving map reading.[58] He asserts that the order of reading a map is unimportant since there is no sequence of perception. Therefore, he believes that cartographers should abandon disguided and behavioristic approaches to mapping, which view map reading as a systematic, linear-sequential activity. He concludes that the map reader needs to be considered as an active agent in the map reading process. Eastman's work holds particular relevance to the conceptual model being developed through this study. If there is no preferable order for teaching map skills then children should be exposed to mapping activities and assisted through difficulties when needed. Individualization of instruction via experiential activities allows learners to interact with the environment, within their realm of ability and motivation.

Bailey offers perceived support for Eastman's contentions

regarding map reading.[59] He believes that map reading is best learned through motivational and relevant activities. He quotes Carl Rogers: "The only kind of learning which significantly influences behavior is self-discovered or self-appropriated learning-truth that has been personally appropriated and assimilated."[60] Bailey's emphasis on the active role of the learner and individualization of learning experiences is strongly aligned with the cognitive field theory philosophy.

The absence of spatial sequencing in maps was also addressed by Head, who discusses the individual structures brought to the map reading process by readers.[61] He believes experienced map readers develop their own structures because none are available. Schlictman in his discussion of Head's article, deals with the complexity of the map reading process.[62] He states: "Years ago map symbolism looked to me like a straight forward calcula, but it has become increasingly clear that we are dealing with a highly complex and even somewhat disorderly semiotic system."[63] Complexities of map symbolism, coupled with the complexities and unique characteristics of individual map readers, adds insight to the difficulties involved for those attempting to bridge the communication gap between map maker and map user. The variation between individual learners, coupled with the complexities within the learning process, adds substance to the argument for individualization of map skill instruction.

Wood addresses the complexity of the map reader in his study

of hill symbols with young children. He concludes that map readers are "complex organisms with a memory freighted with cultural (and other) baggage, among which as streamer trunks and values of graphic symbols constituting a pre-existent context within which a given cartographic symbol is evaluated and interpreted."[64] He believes that symbols used by children to emulate hills on maps are more cultural products than perceptual mechanisms. He sees education as the process which forces a merger between the two. The merger between new knowledge and that which the learner already knows can best be addressed in an individualized curriculum.

Gardner discusses three primary factors relating to school problems in America today.[65] Of specific interest to this study is his concern with psychological factors within the learning scene. He believes that specific developmental, cognitive, motivational, and/or neurological conditions may interfere with schooling and literacy. His concern lies in the cultural diversity within our country, and the individual and unique differences which arise from that diversity. The diversity exists not only in cultural and individual differences, but also between disciplines.[66] His comments on the emphasis of Piagetian theory in education are significant; as he alludes to the exclusive, universal nature of Piaget's domains of knowledge, stating that we need more specific focuses in our pluralistic society.[67] These comments substantiate the need for individualism in our

curricula and instruction.

In his commentary on the work of Downs, Liben and Daggs, Gardner addresses the influence of Piaget's research.[68] With respect to Piaget's universal portrait of human cognitive development, Gardner states: "Much of development, however, takes place with respect to domains that have been formulated within one or more cultures during recorded history. I claim that geography as a domain, and certainly maps as symbol systems, are representatives of domains which are cultural rather than universal."[69] He further urges Downs, Liben and Daggs to look beyond Piaget into the efforts initiated and developed from Piaget's established foundation.

Bale alludes to the natural ability of children to read maps at ages as young as three.[70] He states that children may be able to read maps before they can read words. His understanding of the differences between the sexes in regard to childrens' ability to read maps has significant implications for many concerned educators. He believes that differences between girls' and boys' map reading skills may be attributed to parental power, and restricted mobility of girls due to fear of molestation.[71] His conclusions regarding the correlation between boys' mobility and extended outdoor playing range has important implications to map skill education and the importance of young children getting familiar with their local area. The importance of utilizing children's local area is substantiated by Cohen.[72] Much has been written regarding differences between

boys and girls with regard to map skill performance.[73] Individualized instruction built upon students' knowledge of their immediate environment would go far beyond the mere differences between the sexes, and address the primary concern every educator should possess: the differences between individual learners.

Canright, in her study of cartographics in fifth and sixth grade classrooms, conducted interviews with some of the children as part of her research.[74] Her results indicated that children rarely reflect the rigid stages as depicted by Piaget. She discovered that children were very interested in maps, but found their knowledge of map skills to be low. This suggests that motivation and interest is probable, and that proper instruction implemented at earlier ages than previously thought to be appropriate may be successful.

The work by Muir and her associates, has particular importance to this study.[75] These studies utilize Piagetian theory, along with the work of Jerome Bruner as a basis for establishing methods of assessment, and sequencing of map skills. Though the works are based in these psychological theories, there exists a loose framework from which to structure the proposed application of the theories. Muir and Frazee provide the best example of this "loose" structuring of applied theory in their discussion of hierarchical arrangement of map skills.[76] They believe there is no universal agreement, and that map skill education should be hands-on, concrete at early ages, and anti-task analysis oriented. Muir and her co-authors provide a

flexible hierarchy of skills as a guide to assist teachers when individual problems occur.

Miller indicates that spatial orientation begins at birth and follows a sequential pattern of experiences, cognitive crises and mental reorganizations.[77]   Thus, learning is an active process whereby the structures within the learner adapt and reorganize through interaction with the environment.   He states that many psychological and educational studies test what children know not what they can learn, and thereby underestimate student potential.[78]

Literature on learning theory in relation to map skill acquisition implies that different spatial skills can be introduced at earlier ages than previously thought, or indicated by the research.[79]   Meyer finds that childrens' symbolization abilities develop early, but abilities to orient spatially and to use concepts of scale and external frame of reference appear later, around ages nine to ten.[80] Rushdooney concurs with Meyer's view on the concept of scale, but finds that children can abstract at an earlier age than previously thought.[81]   Miller found that of 150 kindergarten through sixth graders tested, children aged nine through twelve were capable of coordinating perspective.[82]   He further claims that different map skills require different mental abilities, thus further research into individual skills are deemed necessary.

The relationship between creativity and problem solving has been established in the research by Csikszentmihalyi and Weisberg.[83]   They suggest that creativity is more than a function of

IQ and can be enhanced through problem solving activities. Curriculum and instruction emphasis on these higher level thinking skills has significant application to map skill education in terms of utilization of maps to solve problems, and creation of maps to communicate information. The importance of teaching and encouraging such higher level thinking skills is well established in the educational psychology literature, despite efforts to standardize and behavioralize the schooling process.[84] The desire to encourage higher level thinking skills can be fostered through the application of skills to the real problem solving situations within the learner's environment.[85]

Anderson's findings indicate support for Bale's contentions regarding in-taught ability to read and use maps in children at age three.[86] Anderson finds that verbal ability is not a significant factor in the performance of young children on map skills. Her results from the study of kindergarten children indicate the pitfalls of psychological research: psychologists are interested in what a map represents, not in the physical nature of a map and how it achieves its function through the use of perceptual variables.[87] Thus, she contends, inferring map skill ability from psychologically based examinations designed to study process may not be valid. She further states that Piaget's stages of development may not be valid guidelines for introducing skills. It should be reiterated that recent research on Piagetian theory asserts that his stages of development

were far too stringently followed, particularly by the behaviorists, a conjecture Anderson does not elaborate upon.[88]

Doll believes Piaget sees the child's mind as the beginning of all knowledge and learning; it is the framework within which all teaching and learning must take place.[89] Knowledge must be constructed by the learner through active interaction with the environment. "Those wishing to develop a curricular model based on an organismic view of growth and change must consider dialectical interaction between internal and external forces. Nothing is more important to Piaget's theory of cognitive development."[90] Focusing on the unique and individual structures of each learner as they interact with external forces in the learning process is central to cognitive field theory, and contrary to behavioral theory prominent in education today.

Liben sheds further doubt on education which is based on age appropriate indicators developed through psychological researchers.[91] She believes great caution should be exercised by educators seeking to apply these indicators to large scale cognition activities. She contends that study needs to be conducted on cognitive strategies used to organize and extract spatial information to determine how these change with development.

Nelson discusses the implications of children's social cognition, and the impact of highly structured scripts on that social cognition.[92] He states that students typically subjected to advanced and complex

scripts developed and implemented by adults have difficulty learning and restructuring new knowledge. He concludes that serious consideration should be given to bringing the scripts down to the complexity level of the child, and that adult models should be used to help the learning occur.

Cooke attempted to develop a predictive tool for determining when children are ready to begin map study.[93] The purpose of the study was to investigate relationships between spatial cognition development levels and the achievement of map skills and concepts. She used the Iowa Test of Basic Skills, standardized subtest of map skills, as a predictive yardstick against selected variables. After skill levels were identified, she utilized the SRA Map Skills kit to treat the children's deficiencies. Her results were puzzling, with unclear indications regarding the application of Piaget's stages of development, and with the application of the SRA kit. Her conclusions allude to individualization of curriculum and instruction, and the uniqueness of individual learners with respect to presentation of new map skill material.[94]

Fishbein, Lewis and Keiffer discuss the concept of social cognition and define it in terms of coordination of perspectives (the ability to perceive other viewpoints, distinguish from their own, and be able to coordinate with their own): Social - child's understanding of the relationship between their perspectives and the perceptions of others; and, cognitive - child's ability to deal with the projective

internal relationships between three objects.[95] The definitions depict the relationship between internal and external forces with regard to the concept. The authors support other previously cited research indicating that educators should be extremely cautious when applying age designation to any stage of thinking, thus alluding to the need to consider the unique characteristics of the individual.

Laurendeu and Pinard conducted a study of 700 children aged two through twelve, and found that less than twenty percent of children less than nine could consistently coordinate perspectives.[96] The results of their study indicate that this ability increased rapidly after age ten. These results support the point that individual differences do exist among learners, and that instruction should be individualized.

Summary of the Learning Theory Component.

> It is interesting that around the turn of the last century the conception of the learning process as depicted by psychology gradually shifted away from an emphasis upon the production of general understanding to an emphasis on the acquisition of skills.[97]

The need to understand knowledge structures and apply the newly acquired information to related situations is vital to the learning process. Ideally, schools should allow individual students to go as far ahead in different subjects as rapidly as they can, applying new knowledge to different situations in attempt to develop a general understanding of content.[98] The ideal described by Bruner requires individualization of instruction within a child-centered curriculum.

The focus upon important psychological research which has formed the foundation for most of the map skill curriculum and instruction used in our schools in recent decades has been shown to have particular pitfalls, primarily in regard to the rigid application of stages of development to the learning process. Other research has indicated that Piaget's theory, which forms the most significant part of the research base supporting current and recent curriculum and instruction in the field, has been misinterpreted by behaviorists, causing misapplication of his theories.

An attempt has been made to support the contention that learning by students is a function of the interaction of external and internal phenomena in the learners environment. This interaction is simultaneous and mutual.[99] Motivation is an internal process, just as is the structuring of knowledge. The key is the uniqueness of each individual. To maximize the potential of each individual, education must be individualized in line with the philosophy prescribed by field theorists. We must break away from the constraints provided by traditionally interpreted, educational psychology and assist learners to learn material they are individually ready to acquire. This requires a break from teacher directed instruction and a reorientation to a student-centered/individualized curriculum.

There are as many individual learning differences among learners as there are individual learners. Whether it be sex, motivation, cultural background, environment, or heredity (to

mention a few characteristics), the uniqueness of the individual within the classroom setting can not be aptly addressed without individualization of instruction. A review of the literature in learning theory supports the uniqueness and diversity of learners. The significant differing opinions regarding learners as indicated by the literature suggests that if learners are to maximize their own individual potentials within our schools, then their school oriented learning must be addressed according to their individual needs.

Teachers' Knowledge of Map Skills

An important component of the conceptual model involves what teachers know about the map skill content area. If they are to be placed, as they typically are, in the position of imparter and interpreter of knowledge, then it is vital that they are knowledgeable in the subject area. Unfortunately, in most circumstances, this is not the case. Most teachers responsible for teaching map skills are not knowledgeable on the topic, nor are they likely to become knowledgeable particularly in light of their duties and growing responsibilities. What can be done to address this issue?

Downs, Liben and Daggs raise important questions regarding the role of teachers in geographic education. They identify the need to understand the expectations and knowledge of the teacher when addressing the issue of improving geographic and map skills education.[100] Attempts to improve the curriculum and instruction must include those individuals who make the critical yearly and day

to day decisions in the education process, particularly teachers and teacher groups. They call for an integrated effort, utilizing ideas from geography, education and psychology.

Giannangelo and Frazee tested sixth graders and their teachers on selected map skills.[101] The results of their analysis indicate significant deficiencies for both student and teachers. 34.4 percent of the teachers tested scored below the sixth grade level on the same test administered to students.[102] They conclude that little research has been completed on teachers' mapping skills and the relationship to student performance.

Frazee examined map reading skills for both teachers and students at the intermediate grade levels utilizing the Iowa Test of Basic Skills, section W.[103] The results indicated that teachers generally scored only two grade levels above the level they were teaching. He recommended that a study focusing on teaching techniques to determine if methods of instruction were appropriate to the skills being taught and the associated grade level.

Schneider attributes lack of student improvement in map skills to the limited geographic knowledge of teachers.[104] The results of his study indicate that few teachers are required to take geography courses in their college program. On tests given to sixth graders the results were comparable to those found in other studies: poor map skills. He discovered similar problems with teachers, but to a lesser extent. He states that: "If teachers through lack of academic

background or practice do not have a solid grasp of map and globe skills themselves, then to expect them to devise systematic and appropriate instructional strategies, or to make maximum use of map-related instructional materials, seems overly optimistic."[105] He adds that further data is needed about the extent of teachers' knowledge and skills.

In a study conducted by Weiss, results indicate that the status of geographic education in northern Kentucky was very poor.[106] Of the 25 schools surveyed, only three of the 25 administrators had any type of geographic training in college, and only 15 of the 25 schools in the study offered classes on the subject.[107] His results indicate that teacher preparation in the field of geography was weak, and that the quality of the students opting to take geography courses was below average. He attributes the low quality of students enrolling in geography courses to poor instruction, and the opinion that better students were opting for more college preparatory courses.

Stanhope, Dorow and LaSota conducted a study of teacher training and geographic illiteracy, focussing on pre-service preparation.[108] They reported that requisites for teachers have declined steadily since 1934. They contend that "Uninteresting geography presentation by ill-prepared teachers may well indicate how deficient geography teacher training has contributed to the decline of geographic literacy." [109] McKinney conducted a study of 124 undergraduate elementary education majors.[110] He tested the

students in six content areas including map reading, with the results indicating poor overall performance by the students. Salter also cites concern over teacher knowledge and preparation with regard to teaching map skills.[111]

David Gardner, past President of the University of California, Berkeley, stated that in 1982 of the 5,000 secondary teachers (grades seven through twelve) of geography in America, between 20 and 30 percent had taken no classes in geography during college.[112] 30 percent had minored in geography, and only ten percent had majored in the discipline.[113] The lack of familiarity with the subject of geography is a primary concern to educators, one that the National Geographic Society, through its alliance activities, has been addressing in recent years.

Summary of the Teacher Knowledge Component. With the exception of the National Geographic Society's alliance network efforts, little appears to be done in regard to improving teacher preparation in geographic education and map skill proficiency. Research has been examined which establishes deficiencies in teacher knowledge of map skills. Evidence has been presented which indicates pre-service training of teachers has involved a declining amount of geography requirements.

It appears that the utilization of the current demonstration base dictates that teachers must improve their knowledge of map skills in order to interpret and teach the material to their students. Placing

teachers in the position of a classroom expert, who are responsible for directing the learning experience for all children, demands that teachers are masters of the content they teach. Considering the variety of content taught by typical kindergarten through eighth grade teachers, mastery of this breadth of content is unlikely.

The options are numerous, but generally center on four possibilities: continuation with the status quo; making more content and pedagogical demands on teacher via pre-service and continuing education requirements; reduction of the amount of comprehensive classrooms, in effect have content oriented instruction for all levels (social studies teachers for kindergarten through high school); or implement a curriculum and instructional change which removes teachers as "expert-directors" of learning in the classroom, and replaces them with teachers who assist and become part of the learning process. I propose the latter possibility.

An issue not addressed in the literature is the amount of teacher training necessary to impart map skills knowledge when utilizing an alternative philosophical base. A map skills curriculum based upon a cognitive field theory philosophy may require less teacher training, due to the emphasis on individualization and working with more familiar environments before moving to higher levels of abstraction, as demonstrated by commercially generated materials. If the demonstration base is causing so much difficulty, perhaps the utilization of local materials and student generated maps would reduce the abstraction and difficulty of the teaching task.

An intent of this study is to establish a model which uses a more applicable demonstration base and is therefore more easily taught. A result of implementing such a model in a school is less pre-service preparation required for teachers and a more effective program, with more successful results.

Demonstration Base

The demonstration base includes those materials, typically commercially generated, used in the schools to portray geographical information. These materials include textbooks, maps, globes, graphs, consumables and other related resource materials. While the focus of the dissertation is on map skill acquisition, it is understood that associated materials can affect the processing of the information portrayed by maps in the schools. The following review addresses research in the demonstration base used in schools from the fields of geography, cartography, and education. No literature was discovered from the field of psychology relating to this section, though literature from other fields was found to have varying degrees of psychological applicability.

Steinbrink and Jones indicate that up to 90 percent of classroom instruction is provided by textbooks and associated curriculum materials.[114] They believe that the emphasis on textbooks is slightly lower at the secondary level. This is likely considering the prevalence of self-contained classrooms at the elementary levels,

which demand a much wider command of content areas. A secondary teacher may teach only one or two subjects, while many elementary teachers are responsible for over seven subjects and can be as diverse as health, science, physical education, reading, math and social studies. In such instances teachers rely on texts for content and instructional guidelines, particularly in content areas outside their realm of expertise. Furthermore, the authors present evidence that evaluation vehicles provided by the textbook publishers are poorly aligned with provided texts.[115] They call for more teacher involvement to help align tests and texts, for they envision no effort from publishers in the near future to accomplish this needed task.

Hawkins describes massive deficiencies in student map and globe skills, and attributes much of the problem to the quality of textbooks available.[116] He states that textbooks will continue to be the primary instructional tool for teaching geography and mapping skills, remarking that teachers are dependent upon texts due to their lack of personal skills in these subject areas. He calls for more care and attention to textbook development, the skills being taught and how the skills are sequenced.

Carswell and Deleeuw describe problems with children's atlases, and call for a successful match between such atlases and the curriculum.[117] The authors believe that in the design of childrens' atlases, cartographers must seek input from curriculum researchers, teachers and geographers. Winn discusses the significance of atlas

design in regard to childhood education. He feels that mistakes in the way cartographers present information in atlases can have serious consequences for children, including misinterpretation, over frustration, the development of poor map reading habits and generally negative attitudes toward maps.[118] Winn believes that the purpose of a map is to convey the usually confusing and concrete world in a more abstract, but less ambiguous manner. Rushdooney describes commercially prepared maps as among the highest levels of abstraction and, therefore, not an effective tool for most elementary teachers.[119]

Petchenik discusses the complexities of maps, and states that maps must be used repetitively in order to be learned.[120] In her study of a selected group of childrens' atlases she identified extreme complexities, and inappropriate matches between maps and student levels. In her 1985 study she considers that 70 percent of student time in class was spent using textbooks, and that map use was typically textbook associated.[121] Furthermore, because publishers want to publish textbooks which have the widest appeal, they are standardizing education for the entire country, based upon markets in particularly large areas with statewide textbook adoption policies (particularly Texas and California). She believes map and textbook purchasers have the most impact on publishers, not children in the classroom. Petchenik asserts that those involved in textbook and map purchasing must consider the child's perspective and needs, and

purchase accordingly.[122]

The need to produce appropriate map related materials for children is supported by other authors in the literature. Blades and Spencer, Eastman, Wood, Head, and Gerber all express concern regarding the lack of communication between the cartographer and the map reader. Wood and Head address the issue of a map reading language which must be learned.[123] That language is cartography and exhibits extreme complexity and variability among cartographers and map readers. Such variability makes the creation of an appropriate demonstration base a significant issue with regard to the improvement of childrens' map skills.

Canright examined 95 maps for fifth and sixth grade social studies textbook series in her dissertation, and discovered that the commercially produced products scrutinized in her study were not grade appropriate and needed significant improvement.[124] Cooke notes the importance of sequencing map skills properly, but concludes that such sequencing is not consistent among publishers and does not reflect current research on the topic.[125] Miller and Muir also cite concerns regarding poor maps and demonstration base materials available in our nation's classrooms.[126]

Mehlinger, in his article on American textbook reform, portrays an extremely dim picture of American education and the role of textbooks in its future. He contends that as we move toward an era of more accountability and standardization, texts may be selected for

their applicability to standardized examinations, not for their depth of context or interest.[127] A recent article in the Daily Oklahoman reiterated the proposal of the President's Education Policy Advisory Committee to create national standards and tests to measure student performance.[128]

Summary of the Demonstration Base Component. The literature on the demonstration base from the fields of geography, cartography, and education indicate a consistent concern toward inappropriate textbooks and maps in our schools. Reasons behind the development of an inappropriate demonstration base have centered on the communication gap between cartographers and map readers, and on the influence of profit driven publishers and the power they exert on the educational process.

The scenario created is a dim one, and one that will likely persist given the influence of the publishers, lack of communication between cartographers and readers, and heavy reliance on textbooks in the classrooms. Such a portrait depicts an environment where the possibility of improving the map skills of our students is extremely difficult, unless dramatic efforts are made to educate an enormous number of educators. Considering the versatility demanded from typical kindergarten through eighth grade teachers, such education is seemingly unlikely, given the competition from other subject matter in pre-service and graduate level teacher education.

The model developed in this study will focus upon local areas for

meaningful and relevant maps and activities, thereby allowing students and educators the opportunity to develop a map language based on their immediate environment. Once developed, this language can be applied to student generated and commercially developed maps with more ease and success.

Instructional Strategies

Instructional strategies deal with actual implementation of the curriculum within the school. The focus here, therefore, is on application of map skills learning to the practical realm of the classroom. Within a cognitive field theory philosophy, instruction should be experiential, individualized, problem oriented, and student-centered. Instruction in this setting can not be divorced from the curriculum.

Kliebard offers the opinion that curriculum developers must be concerned with what is taught and how it is taught.[129] He believes what we learn has a great effect on how we think, just as how we think has an impact on what we learn. The literature reviewed in this section deals with instruction which can be applied to a map skill curriculum. The intent is to review strategies which may contribute to the conceptual model proposed in this dissertation.

Brown discusses mapping skills instruction for younger children. He cites and agrees with Jerome Bruner that teachers do not let children struggle with dilemmas and impasses long enough to search out and internalize answers, a valuable process to learn.[130] From an

individualized instructional perspective, struggling is permissible if students are given appropriate material to learn. The struggle may involve a general understanding of a concept, the learning of its structure and how it relates to other phenomena.[131]

The Joint Committee for Geographic Education, in their Guidelines for Geographic Education, provide an explanation of the five themes of geography, and include a scope and sequence for geographic education for grades kindergarten through twelve.[132] They contend that: "This section has been organized to suggest desired levels of achievement for two to three grade levels. This is by no means a rigid structure, but it indicates how students should progress logically from concept to concept."[133] Their organization of skills is essentially linear-sequential, indicating strong association with the rigid, teacher-directed philosophy of the behaviorists. Within the scope and sequence are continual references to map skill objectives. Twenty of the thirty suggested learning outcomes presented for kindergarten through second grade are directly related to map skill acquisition. Though a disclaimer certifying the suggested learning outcomes as "loosely structured" is given, it appears clear that typical elementary teachers with little geographic knowledge would present the related material in a rigid mode.

Ottosson contends that the knowledge children already possess about the world around them should be the starting point for map education and use.[134] In otherwords, children should begin with

familiar territory before moving to unfamiliar areas. He believes that introducing maps to young children by using the "view from above" metaphor is inadequate, and offers evidence to support his claim. He feels that presenting maps as miniatures is a far better way. Introducing new skills as they appear relevant to individuals, and promoting discovery learning are examples of Ottosson's commitment to student-centered education. Winn also alludes to the need for individualization of instruction.[135] He notes that though research strategies are growing quickly, the general consensus is that students should become more effective at selecting their own strategies.

The need to perpetuate a holistic approach to teaching map reading skills is defended by Head.[136] He believes that since there is no spatial sequence of maps, map reading strategies should be individualized to meet the unique needs of learners. Gerber believes that age is not significant in the research on map reading abilities.[137] Because of this, he feels that teachers must be aware of individual differences and individualize accordingly. Materials should be provided which are congruent with the levels of the individuals in the class.[138]

Bailey contends that the fundamental problem in teaching map skills is to convince pupils they need them.[139] If needed, then sufficient internal motivation is present to actively learn the skills. He further states that map learning should be applied at the personal level, should be localized, applicable to the individual, and relevant.

The use of the discovery method by children to discover the concept of visual order and its application to problem solving was studied by Gimeno in his work with elementary children in France.[140] The children made and judged maps utilizing trial and error methods as part of the problem solving process. He found that students were able to adjust symbols to different maps when differentiation occurred, specifically when confronting difficulty in discriminating light from dark symbols. He concludes that examination of this program indicates that children were highly motivated and problem oriented, especially when using maps as working instruments to solve problems, a point supported by Eulic.[141]

The education literature indicated a great deal of information regarding instructional strategies for the classroom, many of which have direct application to map skills instruction. Gardner indicates that students must develop the capacity to continue learning out of school.[142] To accomplish this we must individualize education: "But there is no reason why children should all have to study the same subjects at exactly the same time and in precisely the same way".[143] In teachers' quest to maximize the individual potential of each student, they must empower students, and assist them to deal more efficiently with the inevitable disjunctions and confusions which are a part of the learning process.[144] He further contends that when students struggle through frustrations they are developing

integrated skills which bring about higher levels of learning and understanding, therefore higher possibilities of application. The concern with integrating the schooling process with outside schooling experiences is also supported by Yager.[145]

"Doubt and suspicion are the hallmarks of a good student, the inquisitive questioner, the inquiring mind."[146] Hawkins discusses the research of Phenix and the concept of "constructive doubt" which is needed to foster, according to Hawkins: selective attention; sustained analysis; drawing analogies; suspending closure; and avoiding presumptions. He contends that students need to be taught to constructively question information they encounter throughout their lives. Teachers can perpetuate this skill by modelling and by assisting individuals through this constructive process.[147]

Doll supports the need to individualize instruction in our schools.[148] He states that the growing amount of information available demands that teachers provide students with assistance in processing and judging information. The curriculum of the future must address important reform problems: excessive competition in classes; tracking; unreasonable pressures; single textbooks; single scope and sequences; and teachers' unwillingness to accept part of the blame for pitfalls of education.[149] He believes educators need to use varied methods and materials (a point supported by Ross[150]); treat pupils humanely; empower and encourage students to get involved in learning objectives and evaluation (a position supported

by Shuell[151]); and prize creative thinking. Doll discusses these beliefs within the context of our changing times. He foresees a refocusing on values education, and the growing impact of our multicultural society on education.

Muir and Cheek in their research on assessing childrens' mapping skills and problems, reinforce the need to individualize instruction in our schools.[152] They conclude that assessment of spatial abilities is needed to design and improve map skill instruction, and state that it is reasonable to expect teachers to assess students as problems occur. Though they propose the development of a model for curriculum, they do so in a loose fashion, stating the need for a loose scope and sequence, with assessment capabilities, to provide a framework for individualization. The authors insinuate the value of scope and sequence within the framework of individualized instruction.

For the purposes of this study this is a key point: the emphasis on individualized instruction, with an accompanied scope and sequence and task analyses, to assist teachers in addressing individual student problems as they arise. Such a structure, with alternate forms of adaptive instruction available for remedial use as suggested by Ross, would provide teachers with the tools to assist students to reach their maximum potential within an individualized curriculum.[153]

Resnick addresses the differences between school learning and other forms of learning.[154] Currently, she sees little applicability for

school learning to other environments. Knowledge and skill development and their use are often decontextualized in schools, and are learned in the absence of a shared intellectual functioning such as we see in our best work environments.[155] She concludes that the most effective programs for teaching higher level thinking skills have decidedly out-of-school characteristics. Many of these programs have levels of apprenticeship mainly organized around specific subject matter.

Current methods typically utilized in our schools for teaching place location are not effective and are not motivating.[156] Forsyth believes that learning is more efficient when the learner is actively involved in the process. He feels that map color activities are not good examples of instruction. Map of errors activities created by Boehm and Peterson[157] are also lacking in sufficient, active problem solving applications.[158] He feels map skill education needs less teacher directed activities and games, and more guided tours, route finding, hypothetical trips, computer assimilated trips, and adventure games. Experiences should be associated with familiar areas to ensure better transfer of knowledge and applicability.

Bale reiterates the need, especially for younger children, to begin map skill instruction with maps rooted in the known.[159] Once familiar with maps, students can make the transition to small-scale maps and use the elements described in continental and global scales (eleven year olds and above). The importance of beginning map skill

instruction in the known before moving to more abstract mediums is supported by Frazee, and Meyer.[160]

Miller proposes a more structured organization of map skill curriculum activities. He contends: "school systems need to lay out, require and supervise the teaching of a careful sequence of activities that incorporate the use of maps and mapping techniques."[161] Conceptual materials should be introduced in the physical mode of representation, especially for younger students.[162] He believes that construction of maps of local areas using tangible items such as boxes is a good example of instruction for younger children. While he promotes a structured curriculum, his earlier research indicates the need for map skill curriculum to be individualized before a program can be implemented.[163] His statements regarding early age abilities to coordinate perspectives, and the need to focus on cognitive processes[164], coupled with later contentions regarding cultural differences[165], indicate the uniqueness of individual students.

Rushdooney makes a good point when discussing the pitfalls of using manipulatives without an associated, concrete learning experience.[166] Simply allowing children to play with manipulatives in hope of learning skills is not sufficient. Cohen, in his discussion of activities for children involving multiple views of the environment, also alludes to the importance of purposeful instruction, stressing more analysis beyond simple movement through an area.[167]

Rushdooney believes that the concept of scale is too complex for many children to learn[168], a position which supports other research on the topic.[169]

Csikszentmihalyi in his discussion of creativity deals with the interaction between the field (peers, groups, sets of social institutions), the domain (the culture which preserves and transmits new ideas and forms or generalizations), and the individual (who brings about change in the domain, a change that the field will consider to be creative).[170] He believes that creativity is, therefore, the result of the interaction between these three systems. Csikszenmihalyi sees many variables within each of these systems, especially in our pluralistic country. From a schooling perspective, early experiences will have significant input into creativity, and problem finding/solving on appropriate and creative tasks show evidence of increasing creativity.[171] His work provides doubt in the likelihood of the development of a common, teacher-directed curriculum for all students. While the need for individualization of curriculum and instruction is supported by Csikszenmihalyi's research, the point that creativity can be fostered through appropriate tasks has relevance for map skill instruction.

Anderson believes that map skills at early ages should be taught in a concrete manner, emphasizing the immediate environment.[172] Kindergarten children are capable, especially if provided appropriate materials, of doing some map activities without instruction, though

some navigational tasks may beyond their scope.[173] The emphasis on moving instruction from the familiar to the unfamiliar is also presented in her work, and is supported by the work of Fishbein, Lewis, and Keiffer.[174]

In Cooke's study of childrens' spatial cognition development and map skills achievement, she found that students of superior and competent ability in particular map skill areas did not profit from map skill instruction.[175] She discovered that better students did better than their instructed counterparts, indicating that when learners are competent in an area further instruction may lead to boredom. Cooke concludes that there is no need to delay the presentation of skills previously thought to be too far advanced for particular age levels, a position asserted by Bruner.[176] Results from the research by Fishbein, Lewis and Keiffer on childrens' coordination of perspectives supports the caution which should be taken when attempting to apply age destination to any stage of thinking.[177] Cooke's work evokes support for individualized curriculum and instruction for students in our schools, instruction which addresses the unique differences between individuals within the classroom.[178]

An individualized, student-centered curriculum can not be implemented without an appropriate and conforming attitude toward evaluation. Harris and Longstreet write in regard to the influence of standardized examinations that, "What is more, they have become so important in the attitude formation of politicians and the public that

the de facto classroom curriculum is molded in their images."[179]
The authors continue, indicating that the use of standardized
examinations has increased dramatically during the 1980s into a
multi-billion dollar industry. Changing this trend will involve
addressing educators, as well as those parties with monetary and
power interests who prefer to keep assessment centralized and
controllable.

Alternatives to standardized evaluation include open-ended
questions; authentic performances; and portfolio collections.[180]
Harris and Longstreet cite: "A basic characteristic of this group of
models (i. e. alternatives to standardized assessment) is the capacity
to deal productively with indeterminacy and uniqueness of
outcomes."[181] The success of portfolio assessment as an alternative
to standardized examinations is supported by Rief.[182] She describes
in great detail techniques for implementing portfolio assessment and
conditions which must be present for it to be effective. Such
alternative modes of assessing student achievement are vital to the
conceptual model being developed in this study.

<u>Summary of the Instructional Strategies Component.</u> The
conceptual model for this dissertation will include a loosely
structured scope and sequence, supporting a variety of instructional
methods to teach map skills. The purpose of the structure is to assist
teachers to help those students who have difficulty learning
particular skills. It is important to note that individualization of

learning does not mean allowing students to do what ever they choose. It does mean, within a field theory context, that the student has input into what and how material is learned: they are empowered. When problem solving, creativity and discovery learning are featured, internal motivation of students is increased. Utilization of topics which are relevant and familiar, before moving to more abstract topics also increases interest and motivation. In such a scenario, map skill acquisition is acquired through application of the skills. Due to the uniqueness of individual students, it is imperative that teachers have access to a variety of instructional strategies which can assist students to master particular skills. If a student can present and defend an alternative way for acquiring and applying the skills deemed significant, then they are encouraged to follow through via negotiation and assistance with the teacher. Access to strategies can be maintained by reference materials, pre- and/or post-service education, and available topical experts.

I have long believed that the most powerful determining energy within education today, in effect education's "driving force", is evaluation or assessment. Our nation's obsession with standardized examinations is driving the curriculum. The disadvantages include: non-alignment to goals, such as developing contributing members of society; an exaggeration of the significance of specific facts; and ignoring higher level thinking skills.[183] If educators wish to encourage life long learning, higher level thinking skills, problem

solving ability, and other characteristics enabling students to function in a global and ever-changing society, then we must assess our students in a manner which is congruent with our educational goals. The conceptual model will address evaluation mechanisms designed to encourage human interaction, group processing, problem solving and higher level thinking skills.

There exists a need to address alternative modes of instruction congruent with the need to individualize instruction, and to make it more relevant and interesting. But how can teachers with 30-35 students per classroom successfully individualize instruction? This dissertation will address the issue of creating an individualized, relevant and interesting map skill program within the constraints of class size.

Supervision and Coordination

Supervision and coordination of map skill curriculum and instruction involves the role of administration and leadership in the organization, implementation and evaluation of the curriculum and instruction across grades kindergarten through eight. I believe that development of a conceptual model for map skill acquisition would be futile without significant regard for the importance of administrative factors to the model. Decisions made within a school, but outside of the classroom, have vital effects on curricular and instructional matters.

Map skills can be taught in a variety of subject areas, from math,

to science, social studies, language arts, and even music or art. Without proper supervision and coordination between subject areas, some skills may be over emphasized, while others may be omitted. At the primary and elementary grade levels, especially in comprehensive classrooms, many teachers are responsible for teaching all subjects. Teachers in these classrooms typically have academic specialties which they excel at, and other subjects where they do the best they can. In most classrooms of this type, map skill instruction is text oriented, and teacher knowledge is at a minimum.

Further problems encountered regarding supervision and coordination of map skill curriculum and instruction involve grade to grade, building to building, district to district, and state to state coordination and supervision. In a highly structured curriculum, missing particular skills along the way can severely impair progress for students who change schools, move to different areas, or even advance to higher grades. In this section of the literature review the study will focus on these issues, and address the role of field theory within the context of the prescriptive model, with respect to coordination and supervision.

Kirman asserts that geography needs to be integrated into other disciplines in our public schools.[184] He feels that competition for school time is already crucial, and that geography has more to offer as a component of other classes, rather than by itself. He believes the idea of geography linkage to other areas of the school curriculum

needs to be brought to schools, and be sold to those who make the curricular decisions. Within a structured framework for schooling, where teachers are responsible for directing the learning experience for all children despite their individual abilities, the thought of expecting teachers with expertises in fields other than geography to be able to effectively direct map skill instruction is tenuous at best. Currently in some elementary and most junior high schools, teachers instruct subject matters in which they have some expertise. Expecting a seventh grade English teacher to have the necessary skills to lead direct instruction in map skill areas may be beyond reasonable expectations.

Geographic knowledge has been shown to be limited by both teachers of geography and administrators who supervise and coordinate the curriculum in some areas[185], indicating that geographic illiteracy among our nation's geography educators goes beyond the realm of the classroom and the teacher.[186] The literature indicates that integration of map skills into other fields is a viable alternative.[187] However, with demonstrated lack of knowledge in the field by secondary geography instructors, elementary and primary teachers[188], as well as administrators[189], who is available to provide leadership and supervision to the discipline, let alone teach it?

Gardner believes that education is encountering difficult times, with solutions which do, or do not address the true nature of the

problems at hand. He sees negative support for education in this country, which is manifested by politicians and the media, exemplified by the glorification of "street smarts" and the sadistic way "eggheads" are treated and get their "comeuppence" in television and the media.[190] In addition, efforts to standardize education and evaluation in our country are adding to the problem: "...in my view, current efforts to restore order and discipline and to promote greater learning in the primary and secondary schools of America have taken inappropriate forms and are unlikely to work."[191] He states that three primary factors underlay difficulties in schools today: 1) psychological (developmental, cognitive, motivational, and/or neurological conditions interfering with schooling and literacy); 2) secular trends (many aspects of our schools combine to make school an unattractive place for many children); and 3) value systems (tension between traditional and progressive values and circumstances).[192] He believes that until we properly address these factors neither traditional/behavioristic, or progressive attempts to solve the problem will be successful. Properly addressing these factors would require efficient coordination by leadership beyond the realm of the classroom, resulting in significant impact on schooling and, subsequently, map skill curriculum and instruction.

American teachers need more time to prepare, organize and coordinate their efforts for the classroom and school.[193] This point is further developed by Ross when he calls for more collaborative teaching in our schools.[194] Additional and purposeful preparation

time could be a primary contribution to solutions to map skill deficiencies among our students. Teachers with little expertise would have structured opportunities to meet and share curriculum and instructional ideas with other educators. Unfortunately a strong trend toward teacher empowerment in many areas of our country is increasing the duties and responsibilities of many teachers. With increased obligations comes time commitments which may place severe restrictions on curriculum planning, instruction and overall classroom preparation.

Aieta, Barth, and O'Brien discuss the existence of what appears to be a managerial revolution against traditional hierarchical models of management in American schools today.[195] The authors state the need to decentralize power in the schools, add more flexibility and encourage shared decision making. They further contend that all educators must become comfortable with ambiguity and with process-oriented education. The problems associated with the traditional framework of management in schools is also discussed by Doll.[196] He believes that teachers and administrators with conflicting philosophies can seldom work in close proximity for any length of time.

Miller comments on the need for coordination and supervision of map skill programs, but offers no insight on how it should be accomplished.[197] Resnick views educational programs emphasizing higher level thinking skills and those which adopt apprenticeship

type characteristics, as good models for coordination of curriculum.[198]

Schubert sees supervision as an ongoing process, usually involving a variety of people in leadership roles.[199] He states that an ideal style and character of leadership is widely disagreed upon. Of the styles examined by Schubert, the closest to field theory is the collaborative style of supervision. In this style, those persons affected by the supervisory process are involved in the decision making within that process. Again, the increased involvement may take its toll on classroom instruction and preparation.

In his book entitled "Thriving on Chaos," Peters discusses the managerial revolution taking place in many parts of the world today.[200] Many of the characteristics of this revolution have direct application to the supervision and coordination of our schools. Peters believes that businesses must be customer oriented, indicating that schools should be student and community oriented. He further discusses other business revolutions which are proving to be successful in our ever changing world, which have high transferability to education: perpetuation of bottom-up management; preparing for and promoting change; having well paid, well trained, and empowered workers; a major reduction of the levels of bureaucracy; the promotion of thoughtful failures and prototypes, which contribute to the quickening of the idea to implementation time; and rewarding innovation.[201] These ideas

have strong characteristics of cognitive field theory.

Peters believes that the uncertainty of the world can be dealt with only if the organizations can fall back upon the certainty and value of people and groups.[202] The issue of the uncertainty of change in systems is further brought out in the work of Brown, Prigogine and Stengers, Schwartz and Ogilvy, and Kuhn. In Peter's model employees are empowered and valued. Application of Peter's model to schools would require that teachers, parents and students become empowered. Such application would have important implications for management, supervision and coordination in our schools.

<u>Summary of the Supervision and Coordination Component</u>. Two primary items have been identified through this section of the literature review as having significance to the conceptual model being developed: the importance of providing structured and purposeful time for teachers and educators to coordinate curriculum and instruction; and applications of a current managerial revolution to supervision and coordination of the schooling process.

Purposeful and structured preparation time for educators would allow for sharing of information regarding curriculum and instruction in classrooms. From an individualized, student-centered perspective, this would allow teachers who have limited knowledge in an area to collaborate with others who have particular expertise. Teachers in this scenario are facilitators of the learning process, not directors.

Schools operating within this model would seek to hire educators who could complement their staffs, offering needed skills and expertise not available within their school.

Applications of the managerial revolution have significant carry-over capacity to education. Fundamentally it involves empowering those who are directly affected by the educational process: teachers; students; parents; and community. With current attitudes toward education indicating a communication gap between school and community, steps must be undertaken to close the gap and empower participants.[203] Doing so should increase relevance of the curriculum and applicability of learned material through individualization.

Research needs to be conducted in the area of alternative supervision modes within schools. Research in a variety of fields has indicated the need for organizational change in our schools, but application of such changes appear to be absent. Experiments need to be conducted in this area to determine possible adoptions of parallel organizational models, and the application of theory to practice. The model created in this study will suggest implementation strategies for undertaking such an adaptation. Doing so will provide a framework for implementation and experimentation at the classroom, school building, or district level.

Sequencing Map Skills

Distinguishing individual skills described by researchers, and

investigating how those skills should be sequenced for students, are significant areas to explore in this review. This section contains an examination of the subskills or proficiencies composing the map skill curriculum, and recommendations for sequencing those skills within the curriculum. Suggestions for integrating the organized scope and sequence of skills within the conceptual model will also be addressed.

Anderson states that: "The issue of how to structure the introduction of mapping to younger children has also been largely ignored."[204] Downs, Liben and Daggs address the issue of integrating education, geography and psychology in the effort to properly develop and effectively structure map skill education.[205] The significance of properly structuring map skill curriculum and instruction has been well covered in the literature.[206]

Brown describes four general map skills to teach: 1) map vocabulary; 2) cognition (patterning, matching, embedded figures, puzzles, mazes, and tangrams); 3) sorting and graphing; and 4) scaling (size, shape, and distance).[207] Though not elaborating on the skills and their sequencing, he addresses the issue of instruction and the need to develop universal thinking skills.

The Joint Committee on Geographic Education provide guidelines organized around the five fundamental themes of geography for grades kindergarten through twelve. They state that: "Geography in grades 7-12 should build upon, review, and reinforce the geographic

concepts and suggested learning outcomes outlined for grades K-6".[208] Of the 84 suggested learning outcomes given for grades kindergarten through sixth, 40 are directly related to map skills. The Joint Committee indicates the need to implement the prescribed outline with knowledge of stages of children's development, while drawing upon the rich and varied experiences of the child.

Particular map skills addressed through this source include the knowledge and use of map related terms, knowing directions, making maps of local areas, and comparing maps with pictures, at the kindergarten through second grade level, to mapping trade routes, working with latitude and longitude, and recognizing distance, direction, scale, map symbols, and the relationships of maps and globes, for the fifth and sixth grade levels.[209] It is important to note that the suggested learning outcomes signified by the Joint Committee do not provide detailed sequencing of skills.[210]

Kohn claimed that it is desirable to teach map skills in proper sequence, and at the proper time.[211] His work attempts to delineate and sequence map skills for teacher use in instruction. Kohn identifies six map skills for instruction: 1) the ability to orient the map and note direction; 2) recognition of map scale and computation of distance; 3) location of places on a map and globe using a grid system; 4) recognition and expression of relative locations; 5) use of real symbols and the ability to "look through" maps to see realities for which the symbols stand; and 6) correlation of patterns that appear on maps and making inferences concerning the association of

people and things in particular areas.[212]   He believes that children at earlier ages should make maps and utilize familiar features.

Whipple and James discuss stages of child development and sequencing of map skills in their research, implying that map skill instruction is incongruent with knowledge of child development.[213] The authors suggest seven map skills for which instruction needs to address: 1) promoting readiness for understanding maps and globes; 2) teaching various map perspectives; 3) understanding the concept of a map and what it represents; 4) teaching map symbols and what they stand for; 5) knowledge and application of longitude; 6) knowledge and application of latitude; and 7) use and application of map skills.

Ottosson believes that map skill sequencing should be child-centered, focusing upon the individuality of the student.[214]   Early map use, according to Ottosson, should include comparing familiar areas to maps representing those areas; introducing new symbols and their meaning as they appear to be relevant; and map alignment and orientation applied to the actual environment and terrain.   Focus on the individual as the basis for sequencing skills is supported by Eastman and Head.[215]

Gerber states that the process of competence and performance in cartography has two components: 1) identification (being able to label objects by their look); and 2) comprehension (including: a) knowledge of symbol in context; b) knowledge of symbol out of

context; c) understanding of concept represented by symbol; and d) making inferences using information derived from symbol).[216] Gerber believes that map skill instruction should be individualized, with teachers being aware of each pupil's level of ability.

Muir and Cheek, in their examination of different means of assessing childrens' map skill abilities, identify seven spatial map skills: 1) perspective (bird's eye view, and a skill decidedly missing from most curriculum and instruction); 2) location (grids, including use of simple coordinate systems, as well as longitude and latitude); 3) direction (real world and on flat maps); 4) distance (calculation in terms of direction); 5) elevation (vertical distance, reported in intervals or in feet/meters); 6) relief (topography or contour); and 7) scale (size of the reproduction, reality to map, and proportion).[217] They assert that a loose organization of skills is appropriate for curriculum and instruction, as well as individualization.

Muir and Frazee discuss eight map skills including the seven addressed by Muir and Cheek, and interpreting symbols.[218] The authors contend that no universal hierarchies of map skills exists. They believe that the utilization of hands-on activities, manipulatives, and concrete learning experiences are important, especially for younger children. Muir discusses the seven map skills supported by developmental theory.[219] These skills are similar to those indicated in the work of Muir and Frazee, with the exception of including elevation as component of the relief skill. The seven skills

used by Muir are also utilized by Muir and Cheek.[220]

Frazee discusses five basic map skill categories for map skills curriculum: 1) direction; 2) scale and distance; 3) location; 4) symbols; and 5) globes.[221] In relation to the skills identified by Muir, Frazee eliminates relief from the skill categories, but alludes to perspective as a part of other skills. He provides an excellent explanation of each skill, and includes associated activities to be used when teaching the skills.

Ediger and Bale allude to the need to have purposeful and interesting activities, within an appropriate sequence of materials.[222] Bale identifies six map skills which should be included in a map skill program: 1) perspective; 2) position and orientation (grid and relative location; 3) scale (models and different scales); 4) map content; 5) symbols (key/legend use); and 6) additional information.[223] He also provides a structure for imparting the map skills sequenced.

Canright states that: "Although so far the results have been inconclusive; it seems clear that a hierarchy of map use abilities (and tests), however loose, must exist, one dependent on both cognitive development and factors of experience and training."[224] She cites five map skills which need to broken down into a scope and sequence: 1) representation; 2) location; 3) measurement (scale, and to scale); 4) scale; and 5) symbols. She believes no hard and fast sequence for skill acquisition truly exists, but there is a need to focus on a systematic sequence of subskills within these prescribed

fundamental skills.

A hierarchical sequence for map skill instruction is also offered by Meyer.[225] She developed a model outlining the hierarchy of map skill acquisition from early primary grades to early secondary grades. She contends that map skill instruction: "should help the child develop: 1) the ability to make a map; 2) the ability to "read" or get information from a map; and 3) the ability to interpret the information presented by a map."[226]

Meyer conducted a detailed survey of relevant literature on the topic and applied that background to the development of the model. Early primary skills to develop included learning to observe carefully, conserving distance identity, and applying the concept of symbolization.[227] She admits that many children may have developed these skills prior to entering kindergarten. Late primary skills include: utilizing manipulative ability; applying concept of measurement; and using own point of view exclusively (which later develops into conservation of space, and the ability to distinguish own viewpoint from that of others).[228] These abilities form the foundation for the hierarchical development of other abilities leading up to the ability to determine distance, direction, location, and to identify what is being illustrated by a map. She contends that "map-making and map-reading skills have almost entirely the same prerequisites in the sequential structure, although map-making also requires prerequisite manipulative abilities and information-

gathering abilities."[229] She identified critical requisites necessary for establishing an accurate hierarchy of skills, but acknowledged that further knowledge and understanding of the prerequisites needed to be completed, and was beyond the scope of her study.

Savage and Armstrong describe eight basic map and globe skills within their text.[230] They establish and emphasize a "loose" hierarchy of skills, indicating that a general simple-to-complex pattern is preferable; complementing the wide range of student abilities.[231] Of particular interest is their focus on interpretation of maps and globes.

Summary of the Map Skill Sequencing Component. Of particular interest to this study in regard to sequencing of map skills, is the work of Muir and Cheek, Bale, Savage and Armstrong, Muir and Frazee, Muir, and Meyer. The development of the map skill curriculum will rely heavily upon the sequences presented by these researchers, but will also consider the work of other researchers reviewed in this section. In the model building stage of this dissertation, considerable attention will be given to sequencing of the selected skills, coordination of prerequisite skills within the selected skills, implementation strategies, and instructional techniques and activities.

Summary of the Literature

The literature review has covered the philosophical base for undertaking the dissertation research, and the six components

identified as contributors to map skill acquisition within the school framework. The results of the review indicate a significant amount of research completed on this topic from a variety of disciplines.

Authors have identified a notable amount of research that needs to be undertaken in areas relevant to this study. In the area of cognitive field theory, studies need to focus on application of the philosophy to schooling. Doing so would allow refinement to occur, along with actual measurement of success. Literature on this philosophical base indicates strong possibilities for successful application to map skill programs. However, implementation of such a philosophically based program would be a major undertaking, one which would challenge our eclectic based, and behavioristic influenced systems of schooling.

Literature focused on the six contributing components to map skill acquisition is also abundant. Researchers have expressed, and alluded to, the need for more study in the areas of alternative demonstration bases, alternative modes of instruction, and teachers' and administrators changing roles and responsibilities with respect to such alternatives. The issue of individualization and student empowerment has arisen numerous times, evoking interest in schooling change, and the repercussions of such changes. Research needs to be completed in these areas, research which addresses effectiveness of the change, and change repercussions.

Research in the area of map skill sequencing indicates the need

to further study the sequence of skills and subskills. Skills need to be broken down further into prerequisites. But how will the further reduction of map skills into subcomponents contribute to map skills instruction, within the philosophical base proposed as the foundation for the dissertation's model? Research needs to be conducted on application and implementation strategies for integrating contributing factors to map skill education within a philosophical base.

We are entering new and challenging times for education in America. Demographics are changing, perpetuating the further diversity of our pluralistic society. As we enter deeper into the "information age" and the "global society," new demands are being placed on our education system. Schools must respond to meet these demands. Map skill education must respond within this framework, a framework with high expectations for assisting each student to reach their maximum potential, and to effectively meet the challenge of our ever-changing world.

Endnotes

[1]David S. Lane, Jr., and Kay Sather Bull, <u>Learning Theory: A Practitioner's Approach</u> (New York: Forthcoming, to be published by Harper and Row Publishers, 1991) Chapter 2, 19.

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[3]Dobson, et. al. 88.

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CHAPTER III

DEVELOPMENT OF THE CONCEPTUAL MODEL

Introduction

The conceptual model was developed in three stages, all congruent with the philosophical base chosen for this study. The three stages include: establishment of the hierarchy for each of the eight identified map skills for grades K-8 (1. understanding symbols; 2. developing an aerial perspective; 3. understanding direction; 4. understanding distance; 5. locating places; 6. map scale; 7. reading relief; and 8. map interpretation); creation of a conceptual framework for curriculum development based upon a cognitive field theory philosophy; and an explanation of how the hierarchy of map skills is integrated with the conceptual framework shown in Figure 1 to formulate the conceptual model for this study. The third stage focuses upon the application of the model within schools and classrooms, indicating how the map skills can be imparted at the practioner's level. A section of this chapter will be devoted to each of these three stages. A conclusion will follow these sections, addressing possible implementation strategies at the district and building levels.
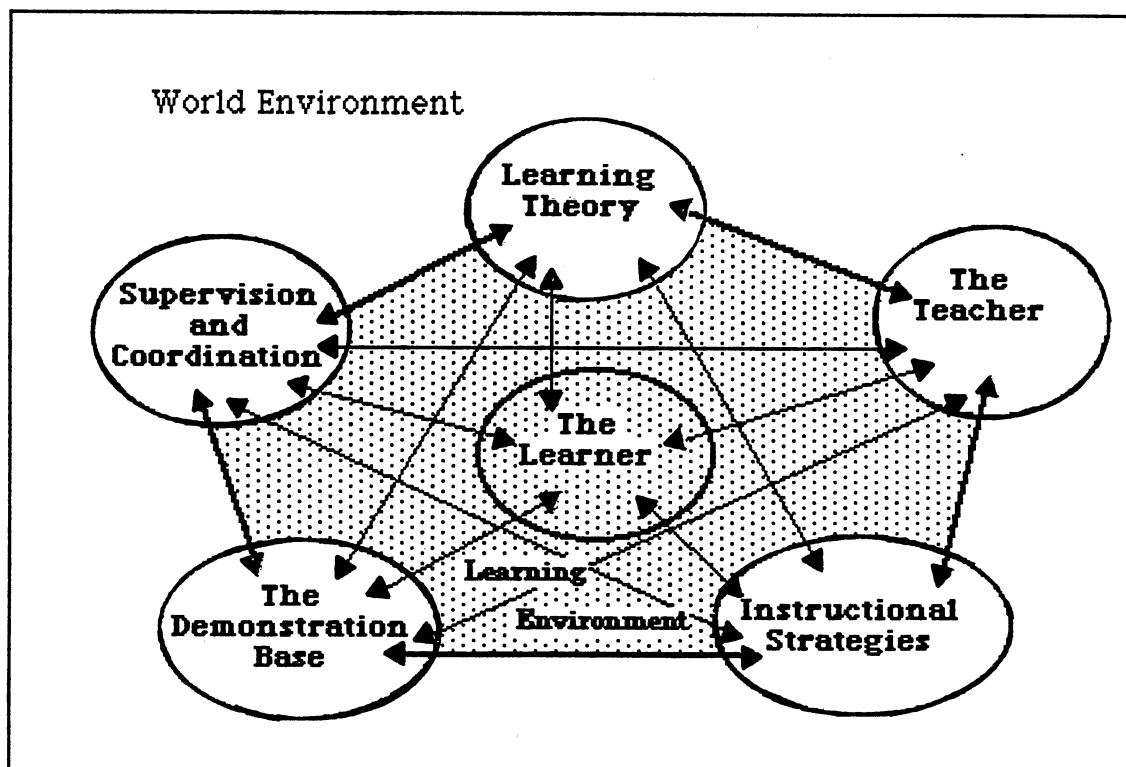
Figure 1. The Conceptual Framework

, Hierarchy of Map Skills

Research on sequencing map skills is abundant in the literature. Between the years 1960 and 1966 there were in excess of thirty-seven studies focussing on this topic.[1] Review of the literature suggests that the enthusiasm toward this topic has not dwindled.

For the purpose of this dissertation, several map skill sequencing studies were selected for their detail and consistency.[2] These studies contain collections of map skills and proficiencies (or subskills), with hierarchical references included. The collections were individually scrutinized, and then integrated into a sequence of map skills for this study. The eight general map skill areas delineated for the dissertation are skills which should be mastered by students before entering high school. The intent is to encourage a deductive approach to understanding and teaching these eight general skills. This does not mean that kindergarteners should be taught in a rigid whole-part-whole mode. It does imply that kindergarteners should know why they're learning particular things, and how that knowledge fits into a simplified, yet larger picture.

The organization of a set of proficiencies within each of the map skill areas in this study evokes a "loose" and flexible hierarchy of objectives, with indications of when to introduce the subskills. It can also serve as a prescriptive device. When a student cannot grasp a particular concept, the hierarchy provides the teacher with a general reference of plausible, prerequisite concepts for learning the task

being challenged.

In a field theory oriented classroom, the curriculum is problem based and student-centered. New concepts must be introduced, and accompanying activities should be designed to allow learners to apply those new concepts to problem solving situations. The established hierarchy of skills allows insight into when the skills should be introduced, and possible learning remedies for specific learning problems which occur during the course of developing the proficiencies.

Each of the eight map skills are sequenced in a concrete to abstract manner. At the primary level skills reflect the emphasis on the child's immediate environment. Children learn about shapes, colors and other simple concepts. They eventually move on to more advanced and abstract concepts necessary to fully utilize map skills in the more demanding content areas, and problem solving situations encountered in high school.

The following sections of the map skill sequencing component will include a brief introduction to each of the eight general skills, followed by a hierarchy of proficiencies, with indications of what level the proficiencies should be presented. Grade levels are categorized as primary (kindergarten through second grade); intermediate (third through fifth grade); and middle level (sixth through eighth grade). Grade categorization accentuates the flexibility characteristic of the map proficiency hierarchy.

Teachers may find their classes, or students within their classes, to be advanced or decelerated in regard to particular proficiencies. In such instances adjustment and/or individualization must occur to meet the specific needs of the learners. The hierarchy of skills and recommendations for introduction are meant to be flexible; a framework for reference. It is a "loose" framework designed to assist teachers to facilitate map skill learning in a manner congruent with the conceptual model, cognitive field theory, and the best interests of children.

Skill One: Understanding Symbols

Symbols should be taught, as in the case of the other skills, in a concrete to abstract progression of difficulty as children progress through the grade levels. This skill involves learning simple and complex forms of shapes and colors. The hierarchy is based upon six levels of difficulty: 1) real objects; 2) three dimensional objects; 3) detailed drawings; 4) simplified pictograms; 5) child generated representations; and 6) cartographic symbols.[3]

Table 2 displays the hierarchy of proficiencies within this skill area. Developing proficiency in the use of map symbols is essentially a reading task: learning the meaning of symbols in print and utilizing that knowledge in more complex situations. Symbols are a convenient "shorthand" for phenomena which exist in the real world.[4] Symbols, therefore, represent an abstract form of communication. Exposure to such abstractions at the primary levels

TABLE II

GENERAL SKILL ONE: UNDERSTANDING SYMBOLS

Primary Grade Proficiencies

Recognizes and uses colors and symbols to represent simple and real things.

Recognizes and uses terms to express size and shape (big/small, larger/smaller).

Recognizes the Earth as being basically round.

Verbally describes their environment and understands pictures can represent it.

Reads/understands simple map legends, and simple color/shape symbols commonly used.

Uses pictorial symbols for common items in their environment (desks, homes, schools...).

Recognizes the meaning of commonly encountered signs (Stop...).

Uses map symbols instead of labels when creating a simple map.

Compares pictures and maps of the same, familiar area.

Recognizes the basic shapes of the continents and oceans.

Intermediate Grade Proficiencies

Recognizes and uses symbols for the major landscape features on maps and globes.

Recognizes and uses traditional symbols for cities, railroads, rivers, and highways.

Recognizes the shapes of smaller land masses, such as islands, peninsulas, and deltas.

Recognizes the shapes of smaller bodies of water, such as lakes, bays, and sounds.

Middle Grade Proficiencies

Utilizes the symbols on special-purpose maps.

Recognizes that the same symbol may mean different things on different maps and globes.

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must be concrete. New concepts must be directly associated with phenomena in the child's environment. At early ages childrens' environments and understanding of their environments are limited. Exposure to abstract concepts, such as those encountered when learning about symbols, must consider the extent of the child's current life space.

Skill Two: Developing an Aerial Perspective

"Perspective is the ability to recognize or imagine objects from various points of view."[5] Proficiency in this skill usually develops in three stages: 1) children depict images as profiles rather than aerial viewpoints;   2) children realize other perspectives exist but are unable to describe them accurately;   and 3) they correctly envision all possibilities.[6]

Table 3 indicates the hierarchy of proficiencies for the three levels. The immediate environment, hands-on experiences, and utilization of aerial photographs are emphasized in learning this skill. Personal experiences using aerial photographs with sixth graders exemplified the powerful learning opportunities evoked with this instructional tool. Using aerials to instigate problem solving is a wonderful and high interest way to apply proficiencies in learning situations.

Skill Three: Understanding Direction

Table 4 shows the hierarchy of proficiencies for understanding

TABLE III

SKILL TWO: DEVELOPING AN AERIAL PERSPECTIVE

Primary Grade Proficiencies

Recognizes and uses terms relating to perspective (over, along-side).

Observes surface features on local trips and relates to maps.

Compares pictures and maps of same, local area.

Draws a side view of a land feature and compares to a local map.

Builds a clay or plaster representation of local area and describes an aerial view of the representation.

Intermediate Grade Proficiencies

Understands that an object can be represented from different viewpoints.

Compares aerial photos of local environment to maps and field trip visits of the area.

Middle Grade Proficiencies

Creates maps of local area depicting a correct aerial view point.

Interprets aerial photos of known and unknown areas, discerning probable profile views of land forms, and water identification and flow direction.

Compares aerial photos of unfamiliar areas with maps of the same areas.

TABLE IV

SKILL THREE: UNDERSTANDING DIRECTION

Primary Grade Proficiencies

Knows and uses terms related to direction (up, down, left, right).

Follows and gives verbal directions (here, there, left, right).

Knows/uses cardinal directions ("go four steps left"/and general directions: N, S, E, W.).

Traces routes within their local environment using a variety of maps.

Intermediate Grade Proficiencies

Describes the locations of continents in terms of directional locations from one another.

Locates the Prime Meridian and the Equator on the map and globe.

Uses intermediate directions (NE, SW).

Integrates longitude and latitude with cardinal directions on maps and globes.

Uses a compass to locate directions.

Middle Grade Proficiencies

Uses a compass to orient a map.

Recognizes distance and the relationship with maps and globes.

Utilizes intermediate directions to provide precise information about locations and paths of travel on maps and globes.

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direction. Direction refers to the ability to orient oneself within the environment, and eventually to more abstract representations such as maps and globes. Understanding direction develops through stages as children mature. There is a fundamental need to learn and internalize specific vocabulary and then apply that knowledge to situations within the environment. It is vital that environmental and personal directions are mastered before moving on to global directions, a point adamantly made by Muir and Frazee.[7]

Skill Four: Understanding Distance

Table 5 displays the hierarchy of proficiencies for understanding distance. The skill is computationally based; involving measurement and eventually ratios. Skill development progresses through three stages: 1) knowledge and application of relative distance; 2) understanding of conservation of length; and 3) ability to use spontaneous forms of measurement (map scales).[8] Muir states: "Few students can perform map skills that use standard measurement with understanding before grades five or six."[9] She also indicates that non-standard measurement (use of string for example) is much easier to master than scale-of-distance measures.

Skill Five: Locating Places

Table 6 displays the hierarchy of proficiencies for locating places. Location involves both relative (locating a place in relation to another) and absolute (use of a coordinate system to compute exact

TABLE V

SKILL FOUR: UNDERSTANDING DISTANCE

Primary Grade Proficiencies

Compares relative distances between familiar places using terms (far, near, close).

Uses simple measuring devices to compute distance (inches, ft., miles, and metric).

Compares relative distance (time/space) between local places in environment and maps.

Relates non-precise measuring to precise measuring (paces to feet).

Begins to recognize the need for scale to find distance on simple maps.

Intermediate Grade Proficiencies

Understands relationship between time and distance between places.

Recognizes that scales indicate distance on a map in relation to the real world.

Uses map scales to determine distance between places.

Computes highway mileage on a highway map.

Understands difference between distance and area (one vs. two dimensional-mile vs. km).

Compares routes/modes of transportation between places/depicts shortest or fastest.

Estimates distance, then checks accuracy using a mileage scale.

Middle Grade Proficiencies

Understands great circles routes on a globe.

Learns approximate distances between lines of latitude.

Understands/applies relationship between relative distance from the equator and climate.

Understands/applies relationship of relative distance from large bodies of water and climate.

TABLE VI

SKILL FIVE: LOCATING PLACES

Primary Grade Proficiencies

Knows and uses terms related to location (there, right, front).

Knows location of home and school in relation to neighborhood.

Identifies location of school in relation to other places in the community.

Uses simple classroom and local area maps to locate familiar things.

Locates community, state and nation on maps and globes.

Locates other neighborhoods studied on maps.

Uses a simple coordinate system ("Battleship" game).

Intermediate Grade Proficiencies

Locates and describes major geographical features and regions.

Location of places on a map or globe in relation to the Prime Meridian and the Equator.

Describes the location of their state within the nation.

Identifies the location of their community within the state.

Works with longitude and latitude on a map and globe.

Middle Grade Proficiencies

Improves understanding of absolute and relative location in terms of maps and globes.

Identifies the relative location of any place on the globe.

Identifies locations in terms of degrees of latitude and longitude.

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location). Early grade instruction should focus on development of relative location skills, particularly with regard to the child's known environment.[10] Absolute location proficiencies should be taught slightly later, involving simple coordinate systems before advancing to mastery of longitude and latitude in the middle level years.

Skill Six: Map Scale

Table 7 shows the hierarchy of proficiencies for the map scale skill. Map scale refers to the size of a map's representation, not the relationship between distance and the map. This is an abstract concept which can be confusing for children, especially when viewing several maps of the same area, but of differing scales. "It requires the ability to perceive that an area's size remains constant when it is represented by larger or smaller scales on different maps."[11] Mastery of this skill involves understanding the "conservation of space" within the child's immediate environment, before moving on to unknown areas.

Skill Seven: Reading Relief

Table 8 displays the hierarchy of proficiencies for the reading relief skill. Relief refers to the topography and terrain of an area as depicted on a map. It also refers to elevation, and how to compute elevation using contours.[12] The creation and use of three-dimensional models to depict familiar landscape at early grade levels is an appropriate instructional strategy for this skill. Comparing those models to maps of the same area can help children develop a

TABLE VII

SKILL SIX: MAP SCALE

Primary Grade Proficiencies

Understands and uses the basic terms "larger" and "smaller."

Identifies objects of different sizes in pictures.

Recognizes simple increments of measure (city blocks).

Observes, describes and builds simple models of school and home neighborhoods.

Makes and uses simple maps of classroom, school and neighborhood.

Differentiates between maps and globes.

Compares pictures and maps of same area.

Understands and verbalizes conservation of space relationships when encountering enlargements and reductions of original objects.

Intermediate Grade Proficiencies

Recognizes that scale may vary from map to map and globe to globe.

Relates similarities and differences between maps and globes.

Recognizes the basic differences between simple large and small scale maps.

Middle Grade Proficiencies

Understands the differences between more complex large and small scale maps, and is able to apply that knowledge to problem solving situations.

TABLE VIII

SKILL SEVEN: READING RELIEF

Primary Grade Proficiencies

Knows and uses terms related to relative relief (lower, steep, flat).

Knows and uses geographical terms related to relief (hill, lake).

Distinguishes between land and water on a map and globe.

Draws side views of landforms and describes their features.

Creates model landscapes of their immediate environment indicating relief, and describing their features.

Intermediate Grade Proficiencies

Distinguishes terrain features on large and small scale maps, and globes.

Uses relief maps of areas to help explain their characteristics.

Understands contour lines and can apply that knowledge to simple descriptive situations.

Middle Grade Proficiencies

Applies knowledge of contour and relief to more complex problem solving situations (water flow, flood areas, human movement).

Evaluates possible relationships between relief and climate, population distribution, and movement on the Earth's surface.

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sense of relief, as well as evolve an aerial perspective. Later children apply knowledge of contour and relief to problem analysis using maps and globes.

Skill 8: Map Interpretation

Table 9 shows the hierarchy of proficiencies for developing map interpretation skills. Savage and Armstrong believe map interpretation is the broadest skill, stating: "It is perhaps the most important for elementary social studies programs because it establishes a purpose for many of the other map and globe skills."[13] Development of map skills within a cognitive field theory oriented classroom demands application of skills to problem solving situations.

Map interpretation forces learners to apply all the skills, in various combinations, within the problem solving mode. From a deductive perspective, interpretation questions can become problems; encouraging learners to acquire skills needed to solve them. Hence, a whole-part-whole scenario is created: the whole picture is presented in the form of a problem; significance of learning independent skills is encouraged to solve the problem; and synthesis of those skills into a functional mode for application to the problem is evoked. Philosophically the process is congruent with field theory, making the map interpretation skill a fine vehicle for introducing the other general skills.

TABLE IX

SKILL EIGHT: MAP INTERPRETATION

Primary Grade Proficiencies

Makes simple observations on field trips in local environment.

Makes verbal descriptions of information from simple pictures, maps and globes.

Makes and interprets simple maps of classroom, school, home and local area.

Compares simple maps with pictures of same area.

Realizes friends and others live in other places which can be located on maps and globes.

Makes simple maps and models of local environment, and verbalizes a description.

Understands there is more water than land on Earth's surface.

Intermediate Grade Proficiencies

Relates similarities between maps and globes.

Describes simple distributions of phenomena depicted on maps.

Understands different uses of maps and globes (business, sports).

Creates topical maps with proper information (title, key).

Explains basic causes of climate by referring to information found on maps.

Interprets charts, tables, graphs, and more advanced maps and pictures.

Understands simple Earth-Sun relationships (latitude and climate).

TABLE IX (Continued)

Middle Grade Proficiencies

Uses charts, graphs, maps and tables to display data.

Understands Earth-Sun relationship and relation to climate.

Discusses the location of places and phenomena in terms of where and why.

Maps relationships between phenomena on the Earth's surface (sports and climate, population and relief) and interprets.

Explains geographical constraints on historical or current events through reference to maps.

Understands and applies the concept of regionalization to maps and globes.

Summary of the Hierarchy of Map Skills

A hierarchy of proficiencies has been "loosely" established for the eight general map skills identified for this study. A loose structure was necessary to best meet the needs of individual differences among students within classrooms. In general, the hierarchy was developed in a simple to complex, and concrete to abstract format. The research strongly supports the need to organize learning experiences within familiar environments to children before advancing on to more complex and abstract concepts. The hierarchy developed in this study reflects this concern.

Many of the proficiencies displayed relate to more than one general skill, indicating the interrelationships of the subskills. Truly the whole, synthesized collection of proficiencies and skills is far greater than the sum of those proficiencies and skills. This "gestalt" in regard to the skills necessary to read maps, is the likely answer to map skill acquisition deficiencies: map skill education has failed to encourage synthesis of all the individually taught proficiencies (when and if they were taught in a reasonable way and order), and application of that synthesized knowledge in a fashion conducive to solving problems.

This section of the model development has alluded to ways in which map skill acquisition in our nation's schools can be improved. The conceptual model will build upon this basis for improvement; broadening the spectrum to encompass other contributing

components having significant impact on the curriculum.

The Conceptual Framework

Figure 1 shows the conceptual model for curriculum development for this study. The figure is designed to be a mutable model, and alterable or changable under slight pressure from any of the involved components. Components include five of the six contributors identified in this study: learning theory; teacher knowledge of map skills; the demonstration base; instructional strategies; and supervision and coordination. Map skill sequencing will be integrated with the framework in the next section of this chapter, thereby constituting the conceptual model. The components are enclosed in a rectangle, which represents the world environment including time. The components are joined by arrows, which indicate interaction and influence of the components on one another. Each component evokes some degree of influence upon other components within the framework.

All of the components' borders are fluid. If one component alters, its change evokes a "ripple-effect" felt by the other components in a variety of ways and degrees. An increase in the power and demands of the supervision and coordination component will likely cause the teacher component to contract; resulting in less teacher influence on the learner, the learning environment, the demonstration base, and instructional strategies. Fluidity also indicates movement of all the components through the model space

according to situational dynamics. In effect, time is not linear: the learner's path may adopt many courses and changes within the environment.

This is the nature of a student-centered curriculum within this model: learners functioning within their environment at varying levels of skill and accomplishment. The learner's environment is composed of all things exposed to the learner during the course of his or her ongoing life. As time proceeds, learners' environments typically expand, barring any unforeseen catastrophe. Within their environment they encounter a tremendous amount of teacher input, which is often influenced to varying degrees by outside influences, including supervisors, and/or other sources outside the school.

Despite the considerable amount of influences on learners and their environments, they maintain the option to choose what they do and do not do within their environment. Instructional strategies imparted may not be responded to, or they may be responded to at a later time. This is the choice of the learner, despite the philosophical base of the classroom. If a learner chooses not to attend school the learning environment still exists, but the contributing influential components alter significantly.

Different philosophical beliefs exerted upon the learning environment will dramatically effect the components and learning that occurs. A mental discipline based classroom will contract the learners' environments (that part which is classroom and school

based), in an effort to limit learners' exposure to a specific liberal arts curriculum, with limited and direct instructional strategies.

A behaviorist based classroom will contract the learner's environment in a similar fashion, but in an effort to evoke particular behaviors. Emphasis on standardized examinations (an evaluation technique within the instructional strategy component and emphasized within a behaviorist philosophy), devalues knowledge gained outside the realm of standardized expectations. Students in this scenario learn to shrink their own school-oriented, learning environment according to desired outcomes, or socialize themselves out of the formalized schooling process.

The humanist based classroom would give more power to the learner, thus contracting the influence of supervision and the teacher. As mentioned in Chapter II, this can be a wonderful environment for learning, given the ideal teacher who has the ability to facilitate the process properly. Unfortunately, great humanist teachers tend to be few and great, while poor humanist teachers tend to be many and very poor.[14]

The conceptual model shown in Figure 1 is a curriculum development model because it depicts the framework with regard to where and how learning occurs. Simultaneous mutual interaction resulting from constant interaction within the environment elicits behavior changes (learning) within the learner. As the "core" of the model, the learner is both the focus and the source for curriculum

development. Curriculum development, in the field theory based classroom/school focuses on core concepts, which must be mastered and applied in conjunction with the individual needs, interests and abilities of the learner. This relationship between desires of the school and individuals is best described as a "dance of agendas" which results in consensus, which becomes curriculum.

The remainder of this section regarding the conceptual model development, will describe each component of the model and its function within the context of cognitive field theory. Description will include the relationships between each component, the model, and the other factors involved. A summary of this section will follow the descriptions.

Learning Theory

The learning theory component depicted in Figure 1 exerts most of its influence upon the learner via interaction with the world, and influence upon supervisors and teachers. This denotes the difference between learning theory and learning. Typical elementary students have no knowledge of learning theory: it is an entity outside their realm of understanding which influences their learning environment significantly, in covert ways via instructional strategies, teachers, supervision and coordination, and the demonstration base. In the conceptual model, learning theory influences many components, but the influence is often not reciprocated.

In the cognitive field theory based classroom, the vast

differences among learners are addressed through individualization. When learning difficulties arise, students are empowered to "gravitate toward a path of least resistance;" to seek out ways to learn material more congruent with their learning style. Successful pathways toward proficiency may be discovered with the help of others in the environment, including teachers, and other support personnel. Help may come in the form of knowledgeable advice based upon sound learning theory, designed to meet the specific needs of the individual student.

Learning theory has a dramatic influence on all of the contributing components in the model. School districts attempting to implement the model must be able to justify it in terms of sound learning theory. If such justification can not be given, then the other components will likely be subjected to mutation, as unjustifiable change within a school will be questioned, and eventually realigned with a more dominant model. For example, if a school elicits a field theory based change in their curriculum and instruction, but can not defend the deemphasis of textbooks, standardized testing, and teacher directed instruction via sound learning theory explanations, then the change will likely be unsuccessful.

Learning theory is the justification, the foundation and the glue for the conceptual model and its philosophical base. Without sound understanding of learning theory in regard to a cognitive field theory based model for curriculum development, success is unlikely.

Educators within a system evoking such a change must be prepared to educate the community in order to perpetuate successful change.

Teachers' Knowledge of Map Skills

This contributing component of the conceptual model provides a variety of interactive, facilitative, and interpretive functions within the field theory based system. As interactors within the model, teachers collaborate with supervisors, support personnel, learners, and a variety of parties from the world environment. Interaction in the conceptual model focuses on meeting the needs of learners with regard to school generated objectives, as well as student generated goals. If a student needs information or help the teacher assists personally, or by accessing information from an outside source. Teachers also interact continually with their students; providing bits of direct instruction as needed; facilitating the learning process for the class; and meeting individual needs of students as charged.

Teachers in the field theory mode operate as facilitators of the learning process. If material or knowledge is needed to fulfill specific needs within the learning environment, teachers should facilitate its acquisition through outside sources, via students with varying degrees of guidance, or by his or herself. In this philosophical base, the teacher is not the expert-director, and is not responsible for knowing all content encountered. The realm of possible knowledge entering the combined learning environments of an entire, field theory based classroom of students, is much larger

than the sphere of knowledge encountered in a behaviorist or mental discipline based classroom: students who are given more freedom will choose from a wider base of knowledge, thus creating a larger collection of materials and resources. Teachers in this mode discover the need to master information gathering and processing, rather than information giving.

As interpreters, teachers have the ability, access, and experience to encounter and disseminate information for their students. Advanced education has provided teachers with more knowledge and skills which enable them to assist and teach their students as needed. Teachers have more access to information than students because of their affiliations, peers and other sources they have developed over a longer life span. Teachers also have a longer life span to draw information and experiences from, which, if used properly, can benefit their students.

Teachers within a field theory based classroom do not need to be experts in content areas. They do need to know how and where to get information, and they need a framework for introducing particular skills, and ideas for applying skills to problem solving situations. Most teachers in grades kindergarten through eight have poor map skill knowledge, but sources and knowledgeable people exist in most geographical areas, which can serve as needed resources. School districts should do their best to hire staff members which complement the entire staff, in an attempt to cover all the

content bases, and provide resident experts in all content areas.

The teacher's knowledge of map skill components will impact the model according to the degree of knowledge individual teachers maintain. If it is low, then the supervision and coordination component will evoke more input into the learning environment through the teacher. Student input into evaluation will likely increase, as will their input into instructional strategies, as they seek out solutions to problems with less direct, content assistance from their teacher. Teachers with low map skill content knowledge are forced to rely more upon the demonstration base for assistance, which increases the influence of the demonstration base in the model.

Teachers are the interpreters, facilitators and interactors in this field theory based, conceptual model. They bring experience and skills to the map skill content area. Usually they do not bring much content knowledge. This can be worked out successfully in the field theory model (not nearly as well in a behavioral or mental discipline based classroom). Teachers with little knowledge of map skills need only use their abilities and rely upon other factors in the environment.

Demonstration Base

The demonstration base contributing component intersects with all environments and components in the model. Information in the form of data, books, maps, texts, and charts can be found anywhere.

Of greater significance are student generated materials. Such contributions to the demonstration base are the most valuable, particularly at the primary level.

The map skill demonstration base within a field theory based classroom reflects three things: the need to introduce certain concepts via limited direct instruction; the need to have a wide variety of materials available to learners as resources for solving problems; and the continual need to have students add to the demonstration base by creating maps, models, charts and graphs.

Textbooks are deemphasized in a map skill program based on field theory. Many of the concepts involved in developing map skill proficiency are abstract and complex. Textbooks are typically not in alignment with the learning needs and characteristics of learners. Having kids create representations of their known environment, and verbalize their creation is much more psychologically sound.

In relation to the other components and the conceptual model, the demonstration base is a much more influential factor in a field theory based curriculum. As the learner grows, so does the demonstration base they associate with; they are exposed to more materials, create more materials, and acquire skills giving them the ability to access more materials and resources as needed. In the life-long learning process, the demonstration base is second only to the environment (people included) itself, as a resource for information.

Instructional Strategies

The instructional strategy component of the conceptual model includes strategies implemented to impart the curriculum, and means of student assessment. Teachers and supervisors are more knowledgeable about strategies due to their education and experience. In the model, such strategies are imparted from these sources, particularly in times when new concepts are being introduced. Students have little input on such strategies because of lack of experience. The goal is to provide students with minimal skills so they can be applied to problem solving situations and mastered.

Past this initial phase of concept introduction, learners play an important role in the development of instructional strategies. As empowered and active participants in the learning process, they have input into how they acquire proficiencies deemed important by themselves and/or the school. Instructional strategies, in this scenario, are individualized to meet the needs and desires of the learners. In many cases, the teacher will propose a strategy for learning and/or applying particular skills, while students have the option to negotiate alternative strategies. This process encourages the development of internally motivated, life-long learners.

An important subcomponent of instructional strategies is evaluation. Within the field theory based classroom, all components influence evaluation, but particularly the learner. Evaluation is

ongoing, subjective, process oriented, and must be supported in full by all the contributing components and entities in the model. Evaluation "drives" the curriculum, therefore for evaluation to exist in a field theory oriented classroom/school, it must be supported by a philosophically congruent environment. If not, it will be the first factor to be effected. Evaluation is, therefore, the "gauge" of the model. If an individual wants to see what is occurring in a classroom they should review the evaluation procedures. The mode of evaluation indicates what is valued in the classroom, and the type of message being sent to learners and the community regarding the purpose of schooling.

Supervision and Coordination

This component of the conceptual model reflects the support and organization for the schooling process. Supervisors operating in a field theory based setting do all that is possible to help the teacher and students maximize learning. This includes, but is not limited to: taking care of business affairs in order to free teachers to facilitate learning; upgrading facilities and materials (including parts of the demonstration base); and taking care of personnel/student affairs which are disruptive to educational process. While the effect of supervision and coordination upon the learner is often not direct, it is influential, especially when considering the influence of administration on teachers, instruction, and material approval and acquisition.

Coordination of the curriculum across grades and grade levels is important to maintain philosophical congruency within an individualized, problem-centered school setting. Students allowed to learn in a particular manner may have difficulty when changing classes, schools or districts. Within a field theory setting coordination of the curriculum is significantly less important than coordination of philosophy. If the philosophy within schools is congruent then learners are the focal point of curriculum, and are expected to be active participants in the process. Thus, curriculum coordination is a philosophical issue, not a mechanical-curricular one.

Summary of the Conceptual Framework

This section of the model development introduced the conceptual framework shown in Figure 1, and described the components and their functions within the framework. Within the field theory based school/classroom the component roles are well defined and all focus on maximizing the potential for learners. An environment is created where students are nurtured, and learning is guided through interaction and dialogue between all parties and entities available. Personal skills such as communication, self-reflection, respecting others, developing a life-long learning capacity, and working with others toward common goals, are some spin-off benefits of such an environment. Such skills are sorely needed in today's ever-changing world.

Integration of the Hierarchy and the

Conceptual Framework

This section of the model development delineates how the hierarchy of map skills are integrated within the conceptual framework. Integration of the map skill hierarchy of proficiencies will be described within the context of each of the five contributing components: learning theory; teacher knowledge of map skills; the demonstration base; instructional strategies; and supervision and coordination. During the process of showing how the skills and framework are integrated, scenarios will be described indicating practical applications at the classroom level. A summary will follow, addressing the synthesis of each combined part into a conceptual model for map skill acquisition within a cognitive field theory based philosophy.

Learning Theory and the Hierarchy of Skills

The individualization of curriculum and instruction within the field theory based classroom establishes a high level of congruency between the learning theory component and the map skills hierarchy. Learning theory provides justification for the hierarchy of proficiencies, as well as justifying the curriculum and instructional strategies being implemented to develop those proficiencies as prescribed by field theory philosophy.

Teachers' knowledge and applications of learning theory

strategies in regard to map skill instruction assumes two basic forms: the way teachers develop and impart the limited, direct instruction necessary to introduce new concepts; and the manner they facilitate the problem solving oriented learning which occurs among their students.

When introducing new map concepts in the classroom, teachers should use a variety of audio, visual, and tactile/kinesthetic techniques while attempting to meet the diverse needs of a variety of learners. Having a general understanding of how knowledge is acquired and structured by students is important, and can facilitate successful group learning experiences. When the new concepts are introduced it should be made clear to the class the relevance of the concept with regard to meeting their needs, and how that learned knowledge is vital as a life-long tool. If the concept can not be justified, it should not be taught.

When learned concepts are applied in individualized or small group situations, teachers' applications of learning theory assumes a different role. Through observation and dialogue with individuals operating within the learning experience, teachers can use their knowledge of learning and the learning process to ease stress and/or offer alternatives when needs arise. Through observation of the learning process, teachers develop an understanding of individual differences and needs, understanding which may be useful in many other individual and group situations. Through dialogue and

interaction teachers can help learners become aware of their own learning styles and processes, thereby increasing students' capabilities to become better life-long learners.

When confronted with the task of teaching first graders to relate things in their imediate environment to representations on a simplified map, teachers should be more interested in individual learning processes than with content mastery. Teachers in this scenario should explain the lesson thoroughly to their students, expose their class to a simplified map of the area (perhaps even create a simple map with the help of the class, thereby modeling desired skills), organize a walking tour of the mapped area, explain the product or task to be completed by the students, take the tour with the class, and have the students complete a mapping exercise covering the lesson goals upon return to the classroom. The completed exercise might be a group or individually made map of the toured area, with familiar things located and identified. Throughout the process, the teacher should observe student interaction and behavior carefully, as a means of identifying individual learning traits, and assisting the learning process. When teachers notice particular learning characteristics they should explain those characteristics to the learner, and/or record them for future reference.

An example might include a teacher who observes a student who is fidgety and unattentive during the initial verbal explanation of the lesson and exercise, but who energetically involves themself in the

active portion of the process (enjoys touring the familiar area, shows interest in verbalizing the location of things while on tour, and is actively involved in the creation of the final mapping project). An observant teacher would notice this change in behavior, and should discuss this with the student. A comment might include: "John, I noticed that you really enjoyed the tour today! I was impressed by your comments regarding where the post office was and why they built it there. You also showed a lot of leadership during the group mapping project. You seem to learn better and enjoy yourself more, when you are doing things, John. You have a little trouble when you have to sit and listen. All these things are important for both of us to know, and can help you become a better learner."

Teachers teaching in a field theory mode are more concerned with the process of learning. Removing the teacher from the role of imparter of knowledge allows them to observe and interact with their students, thereby developing a better understanding of learning theory at the individual and practical levels. Their role changes from a controller, to a facilitator of the learning process.

A curriculum within a field theory context, can help students become increasingly aware of how they and others learn, as teachers focus upon the learning process and explain that process to students. This ability can help the learner grow as an individual, and as a contributing member of a group. In essence, the teacher's responsibility is to teach learners to teach by facilitating the mastery

of concepts, and by understanding and communicating to students how learners learn. Doing so perpetuates life-long learning ability, and the capacity to work constructively with others in learning relationships.

Teachers' Knowledge of Map Skills
and the Hierarchy of Skills

Most teachers in grades kindergarten through eight have poor map skill knowledge. This fact is not likely to change, particularly in light of the extended content teachers are responsible for in the elementary grades. Extra responsibilities are also being created through school restructuring efforts; teachers are involved in building based management, curriculum committees, and other assignments reflecting their desire for empowerment in the schooling process. Such commitments detract from the time teachers are able to give to their classroom and students. Additions to the curriculum, including drug and alcohol units, aids instruction, sex equity and minority instruction, are also increasing demands placed upon teachers. A problem exists: if the content knowledge will not increase for teachers in general, how can map skill acquisition by students improve?

Within the field theory framework, the answer appears to exist: 1) remove the teacher from the role as content expert and imparter

of knowledge; 2) find and utilize a psychologically sound hierarchy of map skills, with accompanying suggestions for introducing and applying those skills, or locate a local content expert capable of serving as the resource; 3) use the resource as a guide for introducing key concepts, then allow individuals or small groups to apply those skills to problem solving situations; 4) observe the learning process, and engage in dialogue along the way to better understand the process at hand; 5) utilize teachers' support personnel, and knowledge of information gathering and processing to facilitate the learning process, especially when learners are experiencing difficulty; 6) share evaluation techniques with the learners in an effort to teach students to be critical, but constructive evaluators of their own and other's efforts, thereby helping all parties grow as learners of map skill content, learners of learning, and interactors within socialized learning experiences; 7) encourage the teacher to become the instigator in creating an environment where learning and individual dignity for all participants is valued.

The following scenario serves as an example of integration of teacher knowledge and map skills within a field theory philosophy. In a sixth grade classroom where a teacher is confronted with the task of teaching map scale with little knowledge of the subject matter, the teacher initially requests assistance from other educators in the building. At the same time, that teacher describes the task to be confronted by the class, and asks for their help and input.

Solutions to the problem begin to arise. Another teacher may volunteer some indirect assistance when needed, or a student could bring a set of atlases which show techniques of learning scale. The teacher, with the help of students, books, and other resources, decides to have teams of students map a portion of the playground. The problem is shared by everyone in the class and includes what steps must be done in order to successfully complete the task.

Through problem solving sessions, brain-storming, and bringing in outside assistance in the form of resource people, the class determines a series of procedures, and necessary materials to solve the problem. Then, using compasses, measuring devices, and other materials, small teams of students begin the process of mapping the area. Problem solving sessions occur as needed and provide opportunities for sharing information and discussing frustrations.

When the time arrives to use the field work data to create a map, the need to develop a map scale will arise. Students intrinsically realize the need to reduce field measurements in some uniform order in an attempt to fit all the field information on a specified size of paper. When students are confronted with this need, the teaching of the abstract concept of scale takes on a more concrete and applicable nature. Students will, with little guidance from the teacher, discover the need for scale and the relationship of ratios to the mapping process. Because understanding the concept is

vital to solving the problem, the motivation for learning increases, which in turn creates an environment conducive to better learning and higher retention.

Within this scenario, teachers become learners, and learners learn to be teachers. The teacher is the role model for the learning process. Teachers' knowledge of map skill content is far less significant than their philosophy, and their ability to gather and process information. If they instigate the creation of such a classroom environment they will eventually learn the content of the map skill curriculum.

The Demonstration Base and
the Hierarchy of Skills

The demonstration base is vital to the development of a field theory based, map skill acquisition curriculum. Essentially the demonstration base needs to be divided into three sectors: materials and resources available within the school; materials and resources available outside the school environment; and materials created by learners themselves. In a field theory context, textbooks are deemphasized, and students are encouraged to seek out or develop materials and/or resources which can help them learn and apply new concepts within a problem solving mode. The teacher's role is to assist learners in acquiring and processing information gathered from resources and materials, in attempt to help them attain their

goals.

To enhance the development of an adequate materials supply within the school environment, significant changes must occur in today's schools. Textbooks must be deemphasized, being replaced by larger libraries, electronic media resources, periodicals and other sources of information. The cost of upgrading resources can be offset by eliminating the phenomenal costs related with textbooks, and associated consumables and supplies. Using a wider spectrum of materials requires students to gather and process information, a skill less significant when dealing with the gathered and semi-processed information found in textbooks. Students become evaluators of information, and active participants in the learning process.

Deemphasizing textbooks forces students, with teacher assistance, to seek out information inside and outside of the school environment. Personal experience indicates that students enjoy, and will actively seek out resources seldom used before if given the incentive. City libraries, historical societies, planning departments, airports, and a variety of other institutions and human resources exist within every community which can serve many needs for students. As active learners within information gathering and processing activities, students develop interpersonal skills and confidence, as they gather, interact, and disseminate information throughout the process.

Students given the opportunity to create materials and add to

the demonstration base are utilizing higher level thinking skills based upon knowing and understanding map skill proficiencies. To create a map students must integrate their knowledge of skills and the area into a final product. They become actively involved in the learning process, take ownership in their effort, and take part in a much better learning and retainable experience. Observation of the process can help teachers, the learner, and other learners understand how learning is taking place, thereby establishing a bank of learning theory knowledge, which can be utilized later to better help themselves or others confronting new or difficult problems.

The demonstration base within a field theory based classroom/ school is significantly different than schools based in the dominant mode (behaviorism). Instead of founding the vast majority of instruction in gathered and semi-processed materials (textbooks), students are asked to develop those skills and apply them to problem solving situations. Information gathering and processing is a necessary skill in today's "information age". Information is growing in exponential proportions, demanding that our students learn how to access and process it in order to prepare themselves as contributing members of society.

2nd graders learning about relative distance and place location should use familiar areas and self generated maps, thereby contributing to the demonstration base. A teacher in such a scenario would describe a problem solving situation to their class: "How can we create a map which shows where important places in out

community are located"? As students begin to brainstorm possible solutions to this problem, the teacher can provide direction and guidance. Solutions may differ between individuals and groups, and will likely include some type of field work designed to collect information about absolute and relative distance and location.

The transfer of that information to a simple map is a wonderful learning experience for students and can elicit many opportunities for insight into learning characteristics and social interaction. Presentation of problem solutions to the class enables students to develop ancillary skills in communication areas. Closure activities allow students to reflect upon the different solutions presented and develop a more refined answer to the original problem. Such closure provides an opportunity for developing critical thinking skills as students learn to discriminate positive and negative characteristics of the various solutions presented, and synthesize chosen components into a better solution to the original problem.

In the map skill curriculum, students must have access to a variety of maps for study, and data for collection and organization into graphic representations. Students must discover that their local communities have a multitude of maps and graphics available for use, and necessary to their community's function. Communities are also wonderful sources of data, which can be used to solve problems and create graphic representations for communicating information. Finally, students desperately need to create maps and graphics.

Doing so forces them to apply skills, and expose the learning process to themselves and to others in their environment.

Instructional Strategies and the

Hierarchy of Skills

This section covers three instructional aspects of the map skill curriculum: strategies to introduce new concepts; strategies to facilitate individual and small group problem solving; and evaluation of skill achievement. The key to instruction in the field theory based classroom, is less teacher directed teaching, and more student involvement through individualization. The teacher is seldom the imparter of knowledge, and more a facilitator of information gathering and processing, as they attempt to help students master concepts and solve problems.

When introducing new map skill concepts to groups teachers must take ample preparation time to organize the lesson in a manner which allows for audio, visual, and tactile/kinesthetic learners to acquire the skill. The teacher must explain to the class the relevance for learning the skill. If the skill is developing an aerial perspective at the primary level, the teacher should show children landscape in their local area during a field trip. Children could hear the teacher explain the terrain and how some is higher and lower. Students would see the terrain and be given the chance to express what they see, and they could play on the terrain, experiencing the

relief. Students could explain how the terrain looks from a side view, and compare that with how it looks when looking down upon it from a tree top or ladder.

When students have been exposed to a concept they need the opportunity to apply that limited knowledge to a problem solving situation. Upon return to the classroom students could be asked to make clay models, with the teacher's assistance, of the area they observed. The models would serve as the demonstration base for developing an aerial perspective of a familiar area. The problem becomes "how do we make a model of the area?" Students have input into how they make the model, or if they are capable, they can negotiate another way to indicate proficiency in the skill. While the students work independently or in small groups, the teacher should observe and interact, helping when needed. The strategy becomes one of facilitating the learning process. The more observation teachers can make of the learning process for each of their students, the better they are able to properly facilitate the process. This becomes the ultimate strategy, knowing when and how to help at the individualized level.

Evaluation within the map skill curriculum is shared with the learners, and is process oriented. In the aerial perspective lesson scenario, evaluation guidelines would be developed and shared with the students before the class went on the field trip. When expectations and behaviors are openly discussed, students will have

positive input into how the learning experience should be assessed. Evaluation for this lesson might include: an effort grade based upon effort devoted to the task; a social/behavioral grade based upon behavior expectations during the lesson; a product grade based upon the demonstrated proficiency and the level of mastery displayed; and a presentation grade based upon the student's explanation of the learning process and what was accomplished. At each of these assessment levels students share the evaluations with the teacher.

Instructional strategies within the field theory based, map skill curriculum are student-centered and subjective. Students are empowered to take an active role in the process of developing how they will learn and be assessed. I believe students taught in an environment such as this develop life-long learning skills, interpersonal skills, and content knowledge to a much higher degree of effectiveness. Knowledge is acquired and structured according to individual traits of learners. Being empowered to learn material in an actively individualized manner allows learners to acquire and structure that knowledge according to their needs. With assistance from a nurturing, facilitating instructor, students develop a better understanding of themselves and others in regard to learning and interpersonal skills.

Supervision and Coordination, and the Hierarchy of Skills

Supervision and coordination of maps skill curriculum is

significantly less important in a field theory based school/classroom. Coordination of skills across grade levels is individualized, so teachers are continually responsible for meeting students' individual needs. Since the curriculum is student-centered, supervision is a monitoring process best accomplished by teachers. So how are teachers held accountable for the acquisition of map skills by their students?

General skills and associated proficiencies described in this and other studies provide the framework for knowledge to be mastered. Teachers and students are held accountable for mastery of those skills and proficiencies by each other and supervisors. But there are many ways to demonstrate proficiency, including portfolios and other subjective assessment tools described in this study.[15] Teachers, in conjunction with students, need to accumulate evidence of proficiency mastery which can be shown on an as-needed basis, to any interested parties, including parents, community groups, school committees, administrators, and other parties.

Coordination of the map skill curriculum is accomplished by monitoring student progress with regard to the hierarchy of skills. A "loose" hierarchy of skills provides teachers and students with a guide for skill acquisition. The skills provided by the guide compose appropriate proficiencies which the students are accountable for at each grade level. Teachers guide their students toward mastering these proficiencies, and facilitate individual student efforts to achieve beyond grade level expectations. Coordination becomes an

effort to hold individual students accountable for appropriate skills, encouraging further relevant efforts, and communicating between teachers of similar and different grade levels regarding the curriculum being administered.

Supervision of the curriculum is accomplished by teachers and students, in a shared venture designed to meet individual needs. Empowered students are encouraged to take an increasingly higher responsibility for their own learning, thereby sharing in the supervision of the map skill curriculum. Teachers supervise their students on an individual basis and help students develop their own supervisory capacity. Teachers monitor individual student achievement, facilitate the learning of new material, encourage exploration in different topical areas, and communicate individual and group performance to parent and administrative groups.

Finally, accountability for acquiring map skills is shared by teachers, parents, administration and particularly individual students. Students in a 2nd grade classroom developing maps of their own environment would be taught to discern between appropriate and inappropriate ways to depict relative distance between objects on a map. Learning to evaluate maps done by themselves and peers helps students to become better learners. Empowering learners through the accountability process promotes self supervision of learning and increases internal motivation.

Summary of the Integration Section

This section of the model development involved the integration of the hierarchy of map skills with the conceptual framework within a cognitive field theory based philosophy. The result is the intended outcome for this dissertation: a conceptual model for map skill acquisition for grades kindergarten through eight, based upon a cognitive field theory philosophy.

The hierarchy of skills was developed in a simple to complex manner, with ample flexibility built in to promote individualization of instruction. The accompanying conceptual framework was established with a high degree of fluidity, designed to emote the significant role of the individual learners, and the flexibility necessary to meet learners' needs in an ever-changing, global society.

The evaluation factor within the model is crucial, for evaluation drives the curriculum. For schools to successfully adopt a model such as the one provided in this study, a means and justification for accountability must be established. An argument for subjective evaluation has been established, with accompanying accountability for map skill proficiencies to be shared by teacher and students, and subject to review by entities within the community and school. If such an evaluation-accountability mechanism can be entrusted to students and teachers at the classroom level, then the conceptual model can function successfully. If not, then the long-term success of field theory based schools, classrooms and curricula will face

improbable odds.

Conclusion

The conceptual model has been developed and described for this study. Suggestions have been made regarding how the model functions at the classroom level. A major concern involving evaluation and accountability was introduced, indicating the critical nature of these factors in the schooling process. If our nation and states mandate standardized examinations for their students, then those examinations will drive the curriculum. Teachers held accountable for their students' performance on those tests will teach to the test. Can a field theory based curriculum exist within such an environment? At the very least it would make it considerably more difficult.

The primary step for encouraging the implementation of a field theory based curriculum is to justify the need for subjective evaluation and accountability at the school, state, and national levels. Educators should not separate evaluation and accountability during their arguments, for the accountability factor is overwhelming when considering the huge expense of public school education, and the politics involved. Standardized examinations are easy to score, read and use for comparison. They are fast and objective. Educators willing to argue for subjective evaluation and accountability must show the advantages of their proposed alternative, advantages such as those described in this study.

The other primary step that must be accomplished at the district and school level, to facilitate adoption of a field theory based curriculum, is to promote the engagement of all educators in open, thoughtful, philosophical dialogue. Seldom does this occur in public schools. Teachers are the most significant educators in the schooling process; what they value becomes the curriculum. As the trend toward more teacher empowerment continues to grow, teachers will find themselves making more critical decisions affecting curriculum and students. But what is their philosophical base for making those decisions?

Open dialogue regarding philosophy toward schooling and students invites thoughtful self-reflection. Teachers engaged in this process are confronted with the decisions they continually make individually and as a staff. If teachers agree that all students' needs must be met, and that problem solving and higher order thinking skills should be elicited, then why are we spending so much money on textbooks? Philosophical discussion and reflection promotes congruent decision making. Philosophically, field theory is a rational and relatively easy philosophical base to "sell", but we must engage in dialogue to initiate the process.

The conceptual model developed in this study will work. If implemented it will successfully address many of the pitfalls of map skill curricula examined in the literature. The problem is implementation of the model. This conclusion has addressed two

primary steps which are fundamental to successful implementation: solving the evaluation-accountability issue; and encouraging open philosophical dialogue among educators in our schools. If these things can be successfully accomplished then this conceptual model will work and map skill acquisition by those impacted students will dramatically improve.

Endnotes

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CHAPTER IV

APPRAISAL OF THE CONCEPTUAL MODEL

Introduction

The underlying goal for this study was to develop an effective map skill acquisition curriculum for grades K-8 based upon cognitive field theory. Research indicated that the status of map skill acquisition by our nation's youth was poor and that despite significant research efforts on the topic, little improvement had been realized. The search for answers to this dilemma lead to disciplines outside the immediate realm of geography. The fields of cartography, psychology, physics, and education had significant contributing possibilities when examined in detail. What originated as an empirical dissertation study with positivist implications, quickly became a theoretically based attempt to integrate a large information base from outside disciplines into an effective model. The result is a conceptual model with a wider perspective of the map skill acquisition issue, a perspective which addresses contributing components to the curriculum in a manner more encompassing than previous models reviewed.

The best alternative for appraising the model is to subject it to

analysis through a variety of means. Considering the nationally recognized efforts to improve geographic and map skill curriculum in this nation, it was vital to compare the conceptual model with recent curricula developed on the topic. This comparison provided insight into the model, and continuing problems regarding geographic and map skills curriculum.

In an effort to bridge the implied research-to-practice gap described earlier in this dissertation, a generalized scenario for application of the conceptual model within grades K-8 was developed. The conceptual model, the generalized scenario, and the scenarios described in chapter three of this dissertation were reviewed by knowledgeable educators, in an effort to justify philosophical congruency and viability of implementation.

The remainder of this chapter will address each of these subjective appraisals of the conceptual model: 1) a generalized scenario designed to show applicability of the model within grades K-8, with input from knowledgeable educators; and 2) a comparison of the conceptual model with two nationally recognized curricula.

A Generalized Scenario for Implementation

This section represents a generalized scenario of the model as applied to the K-8 schooling process. This generalized perspective provides an overview of how the model can be implemented, and a general view of how it functions over the course of a school year. Specific references to primary, intermediate and middle level

applications of the perspective will also be addressed in this section.

The generalized scenario and the framework were examined by two OKAGE (Oklahoma Alliance for Geographic Education) teachers[1] and two professors[2] familiar with applications of cognitive field theory within classrooms. Discussion with the selected teachers centered on the practicality of the model: would it work in your room and school and, if not, what must be done to the model to make it a viable possibility? Discussion with the professors focused upon the philosophical congruency of the framework, and viability of the model at the practioner's level. A description of the educators' reactions and input is provided in the summary of this section of chapter four.

A Generalized Scenario

What is the philosophical base for instruction within the district, school, and individual classrooms, and what is the likely impact of a philosophical adjustment? Is there a trusting environment in the schools, where dialogue takes place and participatory change can occur? Answers to these questions form the basis for decisions to implement the model.

An environment conducive to philosophical change is enhanced by an increase of trust and dialogue among educators and patrons within the school community. Once established (usually over long periods of time), the other components can be addressed. The most significant component to consider is instructional strategies,

particularly methods of assessment. Can teachers and administrators endure a fundamental change regarding assessing student achievement? If educators want to evoke change, they must be prepared to reinforce that change through subjective evaluation. Evaluation sends a strong message to patrons regarding what we value as educators in the classroom.

Once the issues of philosophy and evaluation have been successfully addressed, other contributing components toward the features depicted in the framework can be focused upon. Textbooks need to be deemphasized, and available resources and materials need to be increased. Instruction needs to be more problem oriented and student-centered. Teachers need to assume a different role as facilitator instead of imparter of knowledge. Supervision within the school must facilitate the process.

Once these adjustments occur, the schooling process will change. At the beginning of each year all teachers should initiate a lengthy and subjective assessment of students' proficiencies, and compare the results with the map skills hierarchy and appropriate grade level expectations. This should be engaged as part of the "beginning of the year" package, which addresses classroom behavior, procedures and general expectations. This package is designed to establish an atmosphere in which instruction can properly take place. The map skill curriculum proposed in this study depends on and accentuates the development of interpersonal skills. The project to be assessed

should be problem-oriented and require the application of skills deemed level-appropriate, or slightly above. Results of the assessment will indicate individual and general class proficiencies. This will serve as the guide for instruction for the semester, in regard to skills to be taught and individual characteristics of the learners in the class.

The initial projects become the first inclusion in each student's file and are kept in a classroom cabinet accessible by teachers and students. Students and teachers share in the assessment process. They jointly determine the objectives for all projects and organize the objectives for continual referral during all learning experiences. Social interaction, group and individual participation, learning processes, and final products should be included in the evaluation.

After the initial assessment, teachers meet with each student and jointly determine individual goals for a time period. For primary students the time period may be a week, for older children it may encompass a quarter or semester. Goals will include the desired course grade, based upon reaching the agreed upon goals. For example, if the joint effort of students and teachers reflects the need to address and master six specific proficiencies before Christmas vacation, then perhaps the student should be responsible for assembling a portfolio of his/her best efforts on the topics, with the intention of demonstrating proficiencies. Portfolios, along with other evaluation criteria jointly determined by teachers and students,

provide the basis for individual course grades.

Students are required to maintain individual files of all classroom work and update them on a continual basis. Files, along with portfolios of their selected best efforts, provides excellent feedback for parents, administrators, and other interested persons. Students' files are confidential, with the exception of school educators and parents. If a teacher wants to share files with other parties, permission must be granted by the student.

Educational experiences are problem-oriented and allow students the opportunity to apply learned skills. Primary children, with few skills and less ability to work on difficult tasks, would require more guidance. Teachers in these grades should teach necessary skills in large group situations using direct instruction. Such instruction should be conducted in very short periods of time due to the shorter attention spans of younger students. When teaching kindergarteners similarities between pictures and maps, this would involve a short, five minute group instruction simply explaining what pictures and maps are and giving a couple of examples. The teacher would then give the children a problem: "Draw a picture of our school. When you are finished we will compare your pictures with the map of the school I have hidden in my desk."

The students may choose to work alone or in groups. They may also choose to draw a picture of another area. Alternative options for applying the taught skill or skills are negotiated with the teacher and

student. Evaluation of this experience would involve teacher and student assessment of the product and process. Included in that assessment would be criteria developed with the teacher and the class, including behavior and interpersonal skills. Products would be filed in the student folders. Portfolios could be developed also, giving young children opportunities to develop critical thinking skills as they engage in the process of selecting their best efforts.

The kindergarteners in this scenario were subjected to direct and individualized instruction. They were given the opportunity to contribute to the demonstration base, be exposed to maps, be empowered in the learning process, and develop higher level thinking skills. Furthermore, in such a classroom, these students are being sent a clear message regarding what is valued within that school and by that teacher: learning, communication, critical thinking and, most importantly, themselves, for they are the center of the curriculum.

Scenarios developed for higher grade levels would be very similar. The differences basically reflect the advanced skills of these students, including content and interpersonal abilities. Problems to be solved would be more difficult and would involve the application of more content knowledge and/or skills. The learners would be exposed to a broader base of information, along with the skills necessary to gather and process that information. Each grade level allows students the opportunity to build upon their internal

knowledge and skill base. As they mature, they expand the breadth and depth of their scope of study, while learning and utilizing more advanced skills. Evaluation would be similarly based, but expanded in scope to include peer evaluation, speaking, media presentations, plays, and other ways to indicate proficiencies.

Summary

This section has provided a general perspective of how the model can be implemented in the schools. Conditions were presented that should be present before attempting to invoke the model, and steps were recommended for implementation under positive and negative conditions. A general perspective was portrayed which indicated how the model would function at the classroom level. Finally, references to specific grade levels were made which indicated similarities and differences of the model's application.

The model and the scenarios developed in this dissertation were reviewed by two members of OKAGE, with collective teaching experience in excess of 35 years. Both teachers have educational experience at the primary, elementary and middle school levels, and are actively involved in applications of geographic education at the theoretical and practical levels. Both teachers offered positive and negative constructive criticisms regarding the model's practicality.

Beckham believed the model and the perspective were rational. She particularly liked the material on evaluation. Portfolios were unfamiliar to her, but she liked the concept, thinking they would

work well in the classroom. The only concern she had regarding the model was concerning application within schools, with teachers who are unwilling to change.

Many of the teachers in her building refuse to change, oppose new ideas, and are unwilling to continue their personal education. How can education adapt to a changing environment under circumstances such as those? While she agreed that change in education was a philosophical issue, she believes equal weight should be given to teachers and administrators who have the ability to stop or facilitate change depending on their attitudes. In buildings consisting of educators who resist change and professional growth, their impact on the model increases, therefore creating an imbalance amongst the component of the model. In such circumstances school-wide change toward a field theory based curriculum is highly unlikely. Individual teachers attempting such a change on their own could experience difficulties, particularly in regard to peer pressure, lack of sufficient resources, and philosophical incongruencies which could affect their professional relationships with patrons, students, and other people within the school environment. However, the success experienced within those classrooms where change occurs, coupled with the prevailingly public demands for meeting individual student needs and developing interpersonal skills which are an integral part of a field theory based educational process, would likely offset the negative ramifications. Furthermore, success experienced

at the classroom level will serve as a prototype for future change in other classrooms and schools, thereby overcoming initial opposition.

Jones believed that the model made sense and had many characteristics she applied in her classroom. She was in the process of developing a file system for each of her student's work, and was very interested in the application of portfolios. She has experimented with alternative methods of evaluation, and found that the primary "hurdle" confronted was student socialization to the grading phenomenon. Change, according to Jones, must address the socialized individuals within the classroom environment.

Jones agrees that change in schools is primarily a philosophical issue. She agreed that schools can and should be improved, but that many teachers and administrators will be the primary obstacles to that change. Her other main concern was the emphasis on accountability. The need to standardize evaluations of teachers, schools and students determines much of what teachers do in the classroom. She believes that our elements within our society, particularly politicians, are obsessed with quick and easy methods to assess excellence. As long as rigid assessment persists, the likelihood of significant improvement in education remains unlikely . However, she was quick to note that considerable freedom exists for her and others to pursue instructional changes and professional growth within their schools. The objection to change may, therefore, be limited to specific educators within the system and may not be as

prevalent as Jones believes.

The conceptual framework was reviewed by two theorists with research interest and experience in the area of educational philosophy, and beliefs which place them in the cognitive field theory clique.[3] Both professors indicated the framework was philosophically congruent with field theory principles. Both offered their support for the framework and its applicable characteristics, and their insights contributed to the final form of the model shown in Figure 1. The model shown in Figure 1 reflects concern by these professors regarding excess complexity of the original model. Though support for the model's theoretical viability was given, concern over applicability of the model at the practioner's level was expressed. Such concern centered on acceptance by other faculty and administration within a school.

Further consideration, according to the professors, must be given to implementation of a field theory based curriculum within behavioristic and eclectic oriented school environments. Issues such as how to coordinate standardized testing with process oriented instruction must be addressed. Bull indicated that students taught within a process oriented curriculum would be more motivated toward temporary preparation for standardized examinations. Due to a better personal relationship between teacher and students, students would more inclined to respond positively when asked to prepare for such an examination, especially when an explanation for

doing so is given.

The perspective given in this section exemplifies the student-centered orientation of the conceptual model at the practical level. The emphasis on nurturing human growth and facilitating the learning process is an ongoing feature of this model. This emphasis does not change as students mature. What does change is the ability, knowledge, experience and capability of individual learners.

Educators expressed enthusiasm toward the model, indicating that many of the characteristics of the model were being implemented by themselves, and in other practical settings. Possible pitfalls for model implementation were described and discussed, along with ways to successfully deal with such pitfalls. The major obstacle to change, as indicated by all of the educators who critiqued the model, was practioners and theoreticians within the field who refuse to modify the way they do things. All the educators expressed that the individual freedom realized by classroom teachers generally allows for trying new techniques, and provides ample opportunity for furthering professional growth.

A cognitive field theory based curriculum, properly implemented within individual classrooms, would be a successful alternative to product oriented curricula dominating schools today. With the anticipated success of field theory based schooling within individual classrooms would come the demand and desire to base more classroom instruction in this philosophy. The most efficient and effective mode for evoking large scale change, according to

Peters, is through convincing prototypes.[4]   Effective instruction based upon a field theory philosophy, within individual classrooms and schools will provide such prototypes, and will perpetuate the large scale change needed in our nation's schools.

Comparison with Recognized Curricula

Two recent and comprehensive studies on geographic curriculum are compared to this study's conceptual model.   The Joint Committee for Geographic Education's "Guidelines for Geographic Education" reflects the influence of the National Geographic Society's alliance activity.   The five fundamental themes of geography form the framework for the scope and sequence of skills displayed in this work.   The second resource used is the geography component of the publication, "Charting a Course: Social Studies for the 21st Century." Both studies will be compared with the conceptual model, in an effort to discern areas of similarity and difference.   Perceived deficiencies in the curricula models will be described in a summary.

The Joint Committee Model

The "Guidelines for Geographic Education" (referred to hereafter as the "Guidelines") is a joint venture of the National Council for Geographic Education and the Association of American Geographers, published in 1984.   The "Guidelines" portray the critical condition of geographic literacy in our nation.   The five fundamental themes of geography are also described, along with the place of geography in

the school curriculum and a scope and sequence for grades K-12. The place of geography in the school curriculum, and the scope and sequence, will serve as the content for comparison with the conceptual model.

Similarities. The similarities between the "Guidelines" and the conceptual model include a detailed scope and sequence of skills, categorized in a non-rigid structure. Learning outcomes (proficiencies) are categorized in grade groupings similar to the conceptual model, with slight variations. The skills are organized to indicate how students should progress logically from concept to concept.[5] Flexibility is built into both curricula and is also emphasized in the introductory comments of the "Guidelines".

The "Guidelines" also review the need to use student experiences as a basis for instruction. "Where possible, teachers should use students' prior learning in a program of geographic study . . . the rich and varied life experiences of children should be used as much as possible to illustrate and develop the geographic understanding and skills selected for this study."[6] The quote exemplifies the stress placed on establishing a balance between the skills that need to be taught and the students' environments. Though the conceptual model is more individualized, the "Guidelines" provide the basis for a high level of student-centered learning.

Differences. The "Guidelines" is primarily a scope and sequence for geographic skills, much of which happens to be map related.

Though references are made to implementation of the curriculum and to cognitive, psychological, and social development of children, the elaboration is not detailed. The "Guidelines" show the hierarchy of suggested learning outcomes and integrate them with the five fundamental themes of geography, but make little indication of how the hierarchy will function or be integrated within the schooling process.

Ignoring the integration issue is a significant weakness of the "Guidelines." Overburdened teachers with little content knowledge of map skills will realize little, if any, benefit from the "Guidelines." Without sufficient time to learn map skills content, review the "Guidelines", and integrate the combined knowledge into an already compacted curriculum, teachers are likely to forego the anxiety and leave the "Guidelines" on the shelf. The responsibility for successful implementation of this effort lies with the Joint Committee, a responsibility they have failed to address, thus rendering ineffective their research efforts.

Differences between the "Guidelines" and the conceptual model are primarily limited to pertinent curriculum components. Teachers' content knowledge, instructional strategies, and supervision are vital components to curriculum success or failure. To disregard these components in their publication, and to ignore the inability of typical practitioners to implement their ideas invites failure for the "Guidelines" curriculum.

Follow-up activities supported by the National Geographic Society's Alliance Network utilize the "Guidelines" as a base for much of their effort to improve geographic education. Institutes sponsored by the Alliance provide important information and instruction to those K-12 teachers able to attend. However, experience indicates that the goal behind the institutes appears to be increasing teacher content. Such an impetus is impractical and wrong. Teachers attending these institutes have very little, if any, background in geography. To expect a group of teachers to acquire sufficient geographic content knowledge within a one or two week session in unrealistic.

Therefore, the "Guidelines", as well as follow-up activities utilizing its material, is not practical. Teachers must be given a feasible way of effectively teaching geography and map skills which take into consideration the limiting factors that exist, including but not limited to poor pre-service training, growing curriculum and extra-curriculum responsibilities, and a trend toward increased mainstreaming of high and low achievers. Failing to address these and other realistic issues severely limits the effectiveness of the Joint Committee's effort.

Summary. A review of the "Guidelines for Geographic Education" and the conceptual model for this study indicated many similarities and differences. The primary similarity was the hierarchy of skills. The major differences were the lack of implementation strategies and proper consideration for contributing components to curriculum

development by the "Guidelines" study. The conceptual model developed in this dissertation did not address the five fundamental themes of geography, as did the "Guidelines" study. Limitation of this study effort to map skill acquisition perpetuated the decision to disregard the five themes.

The "Guidelines" and accompanying follow-up activities, particularly those sponsored by the National Geographic Alliance Network, have made a valuable contribution to the promotion of geographic education in this nation. Their efforts have created a national awareness of the need to improve geographic education and have made steps toward increasing teacher content knowledge, increasing the size and use of the demonstration base, and developing instructional strategies for implementation at the classroom level.

However, the failure to address the issue outside the realm of behaviorism, has severely limited the effectiveness of their efforts. Neglect of contributing factors to curriculum implementation further detract from the Committee's endeavor. The Joint Committee's effort should have included a more wholistic approach to addressing the issue, including coordination of instruction, alternative modes of evaluation and, primarily, focusing on student-centered curriculum and instruction. In short, a more wholistic approach to the issue within a field theory philosophical base would have made the "Guidelines" a much more effective and applicable study.

The NCSSS Model

The Curriculum Task Force of the National Commission on Social Studies in the Schools published "Charting a Course: Social Studies for the 21st Century" (referred to hereafter as the NCSS report) in 1989. This joint effort of the American Historical Association, the Carnegie Foundation for the Advancement of Teaching, the National Council for the Social Studies, and the Organization of American Historians, included comments on geography by Christopher Salter, past coordinator of the Geographic Alliance Network of the National Geographic Society. The NCSS report is a curriculum recommendation for the entire social studies. The comparison of this report with the conceptual model will describe similarities and differences of the studies.

Similarities. Despite the much wider base of subject areas covered in the NCSS report, there are similarities between it and the conceptual model. Both studies acknowledge the growing diversity of students within our nation's schools and suggest means of addressing that trend. The NCSS report indicates that "the coexistence of increasing diversity and cherished tradition require social studies courses in our schools to cultivate participatory citizenship and encourage the growth of independent, knowledgeable young adults who will conduct their lives in accordance with democratic and ethical principles."[7] The emphasis on participatory citizenship and ethical principles reflect the emphasis on social

interaction, cooperation, and valuing others, which is stressed in the conceptual model.

The NCSS report expresses the need to begin primary level instruction in ways corresponding with children's interests and cognitive and social development. Instruction should initially take place in children's immediate and familiar environments.[8] Instruction should also begin with concrete and experiential activities, especially in the primary years.

Some references to individualization of instruction are mentioned, particularly relating new, unknown learning material to content with which the students are familiar. The NCSS report indicates that teachers need to elicit student ideas, in an effort to uncover erroneous ideas that may exist so corrections can be made.[9] While stressing the need to discern student thoughts on issues, they still view teachers' roles as an instructional guide, not as a facilitator of individualized instruction.

Finally, the content and function of the proposed curriculum follows a general-to-specific and concrete-to-abstract approach to instruction. The study emphasizes beginning with basic skills, such as map and globe proficiencies, as a means of preparing students for advanced inquiry in later grades.

Differences. The report is basically a narrative essay, providing a general scheme for a K-12 curriculum, with supporting ideas focusing on the relationship between specific disciplines within the

broad, social studies field. Little of the NCSS report extends beyond the realm of this general scheme and explanation. As a curriculum proposal it falls short of meeting the diverse needs and realities that exist in the world of the classroom teacher. Topics of concern pursued in the following paragraphs include the role of the teacher in the curriculum, the role of the demonstration base, the general purpose of the NCSS study and the model developed in this dissertation.

The role for the teachers within the NCSS report has strong indications of behaviorism. Teaching to specific skills and teacher control are referred to within the study, both having overtones of behaviorism.[10] Engle, Nelson, Levstik, and Garcia in their reviews of the report make many comments describing the pitfalls of this study in regard to teachers and instruction.[11]

Garcia states, "it is highly questionable whether teachers have the training and expertise to teach the human experience in the variety of approaches suggested by the National Commission."[12] Levstik believes that the National Commission is treating teachers like passive recipients of curriculum, suggesting that the authors open up the possibility that an outside source will impose "teacher proof" materials on teachers.[13]

Nelson finds that the report stresses and will exacerbate conformity, ethnocentrism, and uncritical acceptance of social control.[14] He further states that critical thinking is discouraged,

replaced instead by increased absorption of facts.

A comment by Engle regarding the emphasis on textbooks, standardized exams, and the imparting of sterile curriculum summarizes my feelings on the subject: "This laundering has rendered the social studies almost totally irrelevant to the authentic study of the problems and uncertainties that confront our society today. Why did the Commission ignore this problem?"[15]

These citations reflect my concern for the product oriented, teacher directed curriculum implied by the NCSS report. Essentially, the report indicates that teachers should listen and be aware of student thoughts and processes but that students must conform to teachers' agendas and instruction as developed through an enhanced content-knowledge base, and imparted through well designed textbooks.[16] This is a significant difference between the studies under examination. The inability of the NCSS to deal with the realities within schools is a prime example of the significant gap between research and practice.

Summary. The primary difference between the demonstration base preferences for the two studies is the extent to which the NCSS study emphasizes textbooks. Salter mentions that money for better atlases and current geography texts needs to be allocated to the classroom.[17] The emphasis on texts is extremely contrary to the demonstration base proposed through the conceptual model developed in this dissertation. To assume that all children, despite the tremendous diversity they bring to classrooms, can be served

adequately by textbook based instruction is a behaviorist precept, with little hope for success. The use of textbooks, teaching for facts, and the ever-accompanying standardization of the curriculum and assessment is an unsatisfactory alternative in today's changing world, and is contrary to the conceptual model.

Finally, the general purposes of the two studies are different. The purpose of this dissertation is to develop an implementable model for map skill acquisition that would address the persistent map skill deficiency problems existing in our nation's schools. The purpose of the NCSS study is to propose a structure for social studies curriculum in our nations' schools.[18] The NCSS provides the structure, but with little reference to solving the critical issues involving implementing curriculum under prevailing conditions (teacher knowledge, costs, demonstration base, supervision). By avoiding the reality of the social studies curriculum in our schools today, including components which contribute to curriculum success and failure, the NCSS has dumped yet another completed work on an already stagnant collection of inapplicable research.

Summary of the Curricula Comparison

As part of the appraisal process for the conceptual model, a comparison of the model with two nationally recognized curricula was completed. The curricula were reviewed for similarities and differences with the conceptual model. Results of the analysis were

described and conclusions drawn based upon perceived deficiencies in the nationally recognized curricula.

Generally, neither of the two selected curricula adequately addressed the critical theory to practice problem existing in education today. Both studies provided sufficient theory, but stopped far short of explaining how that theory could be effectively implemented given the conditions which exist in our nations' schools. The result is two nationally recognized products which serve little or no function for schools and children, but meet the demands of academia and the various funding sources.

Summary of the Model Appraisal

This chapter has focused on two areas addressing assessment of the conceptual model: development of a generalized scenario for implementation, and comparison of the model with two nationally recognized curricula. Analysis of each of these areas indicates support for the model, and possible pitfalls which could inhibit successful implementation of the model at the practioner's level. Further examination elicited ways in which these pitfalls can be dealt with, in the effort to implement a successful field theory based curriculum.

Development of a generalized scenario for implementing the model at the classroom level provided the opportunity for practioner appraisal and input. Feedback from the two practioners provided valuable insight into its viability and problems of implementation.

Many of the instructional strategies and uses of the demonstration base described in the model were being implemented in the classroom by these and other teachers. Input from these teachers also provided input into implementation problems likely to occur within particular situations. They both identified standardized examinations, and educator's inabilities to change and grow professionally as primary obstacles to improving schools. Further input from professors familiar in the field complemented practioner feedback with theory which supported philosophical congruency of the model.

Establishing a generalized perspective for implementing the model provided a scenario for bridging the research-to-practice gap described in the opening chapter of this dissertation. This perspective constructed that bridge by indicating how the model would function within the practioner's environment. Such a perspective was not provided in the national curricula reviewed for this study.

Comparison of the conceptual model to the two nationally recognized curricula indicated that the conceptual model neglected to refer to the five themes of geography. Consideration of the five themes was unnecessary considering the specialized nature of the curriculum developed in this study. Furthermore, map skills are more than a part of geography. They relate closely to reading curriculum, particularly at the primary level.

Finally, the comparison of the model with the national curricula evoked many serious deficiencies in the national curricula; deficiencies such as philosophical incongruency, emphasis on teacher control, and overemphasis on textbooks. The primary deficiency of the national curricula is the lack of concern for implementation strategies. The implied assumption existing within these curricula is that implementation is a practioner's problem. However, practioners are generally not capable of transferring theory to practice, due to time and responsibility constraints. The model developed in this study provides implementation strategy and is, therefore, more applicable at the classroom level.

Endnotes

[1] The two teachers selected to review the conceptual framework and the scenarios are Linda Beckham and Rebecca Jones, both of the Tulsa School District. Both teachers are active members of the Oklahoma Alliance for Geographic Education. Both are part-time, second year doctoral students in Curriculum and Instruction at Oklahoma State University.

[2] The two professors selected to review the conceptual framework and the scenarios are Dr. Russell Dobson, Professor, College of Education, Oklahoma State University, and Dr. Kay Bull, Professor, Department of Applied Behavioral Studies, Oklahoma State University

[3] Dobson and Bull.

[4] Tom Peters, Thriving on Chaos (New York: Alfred A. Knopf, 1988).

[5] Joint Committee on Geographic Education, Guidelines for Geographic Education. (Washington D. C.: The Association of American Geographers and the National Council for Geographic Education, 1984) 10.

[6] Joint Committee 10-11.

[7] National Commission on Social Studies in the Schools, Charting a Course: Social Studies for the 21st Century, (Washington D.C.: National Commission on Social Studies in the Schools, 1989) 5.

[8] National Commission 7-8.

[9] National Commission 25.

[10] National Commission.

[11] Shirley H. Engle, "The Commission Report and Citizen Education," Social Education 54(7) (1990): 431-434; Jack L. Nelson, "Charting a Course Backwards: A Response to the National Commission's Nineteenth Century Social Studies Program," Social Education 54(7) (1990): 434-437; Linda S. Levstik, "The Research Base for Curriculum Choice: A Response," Social Education 54(7) (1990): 442-444; Jesus Garcia, "Does Charting a Course Include a Multiethnic Perspective"? Social Education 54(7) (1990): 444-446.

[12] Garcia 445.

[13] Levstik 442-443.

[14] Nelson 434-437.

[15] Engle 432.

[16] National Commission.

[17] National Commission 46.

[18] National Commission 7.

CHAPTER V

CONCLUSION

Initial review of the research on map skill curriculum indicated a considerable amount of research interest on the topic.[1] The research also implied that the map skills of our nation's students were not improving despite the research being conducted in the area. The discrepancy between research efforts and students' acquisition of map skills indicated a problem: considering the wealth of research on the topic, why is map skill acquisition by our nation's students failing to improve?

Further review of the research identified deficiencies in studies regarding curriculum, scope and sequence, and other applications of map skill instruction at the classroom level. Failure to address the problem using research from relevant disciplines, without an understanding of learning theory, and by neglecting other factors which impact curriculum and the schooling process, were some of the examined deficiencies evident in the literature. Review of the research also suggested that the answer to the map skill acquisition problem in our nation's schools existed in a curriculum model which integrated research from relevant disciplines, and devoted effort to showing how the model could be implemented at the classroom level.

The purpose for this study was to develop and assess a conceptual model for map skills acquisition in grades kindergarten through eight based upon cognitive field theory. Cognitive field theory was chosen as the philosophical base for the model development following considerable review of the literature on learning theory and educational philosophy. Development of a map skill acquisition program based upon a congruent and child centered philosophy was an original approach to curriculum development in the field. Secondary purposes for developing a conceptual model based upon cognitive field theory included defending field theory as a philosophical base, suggesting reasons why prevailing philosophies have contributed to lack of improvement, and evincing ways the conceptual model could be implemented within our nation's schools.

The rationale for a field theory based curriculum model was developed, indicating its application at the classroom level, and its capacity to improve the learning environment for students. An argument ensued which described the negative implications of selected educational philosophies on the schooling process and, more specifically, on map skill acquisition.

The model construction was initiated with the establishment of a hierarchy of map skills within eight identified map skill areas. Initially seven map skills were identified: 1) understanding symbols; 2) developing an aerial perspective; 3) understanding direction; 4) understanding distance; 5) locating places; 6) map scale; and 7)

reading relief. During the development of the hierarchy an eighth map skill, map interpretation, was added to the list. The eight skills, derived from review of several studies, were then arranged in a sequential manner within grade levels: primary (K-2), intermediate (3-5), and middle level (6-8) .[2]

Six contributing components to the map skill acquisition model were identified in the literature. The components are: 1) learning theory; 2) teachers' knowledge of map skills; 3) the demonstration base used in the classroom, including texts, related materials, and maps; 4) instructional strategies for imparting the curriculum; 5) supervision and coordination of map skill curriculum within and across grade levels; and 6) proper sequencing of map skills. The first five components were merged into a conceptual framework depicted in Figure 1. Throughout the development of the components, and the merging process, constant consideration of the philosophical base was utilized to check philosophical congruency.

The established hierarchy of skills was then merged with the conceptual framework to form the conceptual model for this study. The impetus was to show how map skills could be taught and acquired within a learning environment operating in a way coherent with the model. The framework depicted in Figure 1 could be utilized in many curriculum content areas. Integration of the framework with map skills allowed a practical application to be formulated in an area familiar to the researcher.

Appraisal of the model was undertaken in a two step process: development of a generalized scenario of implementation; and comparison of the model with two nationally recognized curricula. The appraisal process provided insight into the strengths of the model and depicted some areas of concern which need to be considered particularly in regard to the implementation process.

Conversation with the two OKAGE teachers who reviewed the model evoked two concerns regarding the implementation of the model: teachers and administrators who are unwilling to change and grow professionally; and schools which over-emphasize accountability in standardized forms. Both teachers indicated concern over the condition of schools in this country and described poor teachers and administrators as primary components of the problem. They too acknowledged the difficulty of removing weak (incompetent) educators from the educational environment, therefore magnifying the problem. The issue of alternative modes of evaluation, as described in this study, was supported by the OKAGE teachers, but with indications that state and district mandates for standardization make alternative modes more difficult to employ.

Conversation with Dobson regarding the model and its philosophical congruency indicated his support for the model. He recognized many aspects of humanism through analysis of the framework, and suggested further readings, particularly McDonald and Schwab. His view of humanism is very similar to field theory, as he views teachers as facilitators and learning as an active process.

He agreed that there were few good humanistic teachers, but many poor ones.

Dobson's work in the area of new science and its applications to curriculum have many relationships to field theory: "We contend that a metaphor of experiencing demands an active, as opposed to passive, role of <u>all</u> participants within the school. We do not deny the acceptance of traditional roles that teachers and students occupy; however, we maintain that the (symbolic) educational journey becomes a beneficial experience because of sharing, not simply by having a participant (the teacher) dispense knowledge to others (the students)."[3] The emphasis on sharing, interacting, and non-passive learning are all characteristics of field theory.

Comparisons between the conceptual model and nationally recognized curricula indicated many differences, particularly in the area of application of theory to practice. The national curricula had strong behaviorist characteristics, including an emphasis on textbooks, teacher directed instruction, student adherence to a common scope and sequence, and standardization of curriculum and assessment. Most notable was the disregard for implementation strategy, resulting in two nationally recognized curricula which do not meet the practical needs of schools and children.

The appraisal process for the conceptual model provided vital feedback and support. The results of the process indicate that the model is philosophically congruent, meets many of the needs

depicted as vital to map skill curriculum and acquisition as identified in the literature, and is applicable within many classroom environments. Some teachers and administrators who are unwilling to change or grow professionally are apt to reject the conceptual model. This does not necessarily have to affect those teachers and administrators willing to implement the model. Subsequently, successful implementation of the field theory based model will provide necessary prototypes for further change in other classrooms and schools.

Some teachers may have the capability to apply the model to their classrooms despite being within an environment not conducive to the model's existence. Such implementation would be difficult, and its effectiveness could certainly be reduced, due to pressures outside the classroom, or lack of support. However, many teachers appear to be utilizing strategies and components identified in the model within their classrooms. Implementation appears to be intermittent among teachers who are trying to improve their effectiveness. The conceptual model developed in this study offers a useful guide enabling teachers to improve student's map skill proficiency. The framework established has possible applications to other areas of the curriculum, which could increase teacher effectiveness and the learning process within all schools.

Standardization of assessment in many schools and states also can have a detrimental effect on implementing the model. This poses

a problem which must be addressed in three ways. Within the classroom, field theory based teachers must develop and nurture trust and interpersonal relationships with and among their students. In such a scenario, students will respond more positively to standardized examinations when asked to prepare for them. Students would spend a minimal amount of time readying themselves, taking a temporary intermission from process-oriented instruction in attempt to meet the demands of the examination. Students understanding the standardized examination purpose and assuming partial ownership for their preparation may perform adequately despite the philosophical change in their schooling process.

Secondly, educators need to take a more active role in their local, state and national politics. Decisions made regarding schools and assessment are often made by legislators with little understanding of learning. Educators should be aware of decisions which affect their profession and students. If aware they may actively pursue activities which could influence decision making in areas they have expertise. Furthermore, a proactive stance on critical issues to education would serve as a means for educating law makers and citizens.

Finally, teachers and administrators desiring to implement a field theory based curriculum and instruction model within their schools must engage in active communication with students, parents and community. Experience indicates that few concerned people will

reject the concepts advocated within a field theory based classroom. People believe in developing interpersonal skills and meeting student's individual needs within classrooms. These attributes of a field theory based classroom are easy to defend and meet with general approval by parents and students alike.

Recommendations for Further Research

The research for this study focused on the development of a conceptual model for map skills acquisition. The emphasis was philosophical and theoretical. Suggestions arose during the development of the generalized perspective which add insight into possible applications which could assist in the implementation of a controlled, group study. Such an experimental application would be expensive but could yield valuable insight into alternative models for schooling. Comparisons need to be made between differing philosophical applications, alternative instructional strategies, and affective and cognitive implications of field theory within schools.

A more in depth appraisal of the relationship between teacher knowledge of content areas and instructional effectiveness should be undertaken. Research has indicated that teacher knowledge of map skills is very low. Consequently, considering the dominate educational philosophy currently prevailing in our nation's schools, map skill instruction and acquisition has been shown to be ineffective. Is the lack of teacher content knowledge the cause of

this ineffectiveness, or is the dominate philosophy? It has been suggested in this study that a field theory based educational philosophy may offer solutions to this dilemma by removing teachers from the role of imparter of knowledge and focusing upon individual students. Pursuit of a philosophical change and its impact upon curriculum, instruction, behavior, and knowledge acquisition could have a significant impact on the research.

Comparison of the conceptual model with the nationally recognized curricula indicated several areas of concern. Nationally developed curricula steeped in questionable, traditional philosophies, need to be critically analyzed. Analysis should include effectiveness of implementing national curricula at the classroom level. Further research could identify areas of conflicting interest by contributors in the area of publications which correspond to recommended curricula. There is considerable financial interest in maintaining the status quo. A study of conflicting interests among contributing members to national curriculum committees would be a valuable undertaking.

The conceptual framework shown in Figure 1 has possible applications to other content areas. Application of the framework to geographic curriculum, particularly within the five fundamental themes of geography, is a natural next step. Further applications in the areas of English, reading, other social sciences, health, and comprehensive classrooms has significant possibilities. In general, a cognitive field theory approach to learning within the schooling process is a viable alternative to the mechanistic approach evident in

the prevalent, behaviorist philosophical model.

Finally, a basic concern expressed in this study was the theory-to-practice gap existing in education today. Many topics should be studied regarding the impact of theory on practice at the classroom level. Questions might include: "What is the impact of the NCSSS report on social studies education in our nation's schools"?; "What is the impact of map skill research on textbook development"?; "Can an effective map skill curriculum/teacher inservice be developed, implemented, and assessed within a study area"?; or, "What are teacher attitudes toward colleges, professors and research on the topic of map skill curriculum development and implementation"? Questions which address the implied gap between practice and theory may initiate answers that can explain the persisting problems which exist in our nation's schools; answers which go far beyond thr realm of map skill curriculum and address the entire schooling process.

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