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Instruction of Map Reading Skills

in the Intermediate Grades

(TITLE)

BY

Judith Ann Dickson Tuttle

PLAN B PAPER

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
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1966

YEAR

I HEREBY RECOMMEND THIS PLAN B PAPER BE ACCEPTED AS
FULFILLING THIS PART OF THE DEGREE, M.S. IN ED.

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CHAPTER I

INTRODUCTION

Introductory Statement

International events within recent years have had a serious impact on the life and consciousness of every American. The past generation has brought us two world wars, plus numerous international conflicts, atomic energy, guided missiles, jet planes, satellites, and a host of other inventions that have changed our basic human relationships. The world has been brought closer together through increased travel opportunities and world-wide communication. Strange sounding names of places, unknown a short time ago, are now commonplace; and news headlines force us each day to become aware of other unfamiliar areas.

Since the world is changing so rapidly, no one knows what the future will be for a nation or an individual. Modern political and economic pressures make it urgent that educators abandon outdated concepts and attitudes and correct the widespread ignorance regarding other parts of the world. The weight falls directly on the educational systems of our country; the skills for interpreting our world events must be taught.

Statement of the Problem

Map reading is needed as an academic tool in our schools,¹ but it serves a different function in later life. Map reading is then needed as a social, political, and economic tool in our ever-changing world. Today's schools are faced with the problem of best meeting the needs of the individual for the present and the future. Unfortunately, the training in the use and understanding of maps has been weakened in our schools during a time when the hard core of geography has been reduced or eliminated.² Our schools must meet this problem and establish in their programs instruction which will develop map reading skills in a real, purposeful situation, with proper timing and sequence.

This study is concerned with the problem at the intermediate level. In the United States the teaching of map reading skills has been left almost entirely to the elementary schools.³ This further complicates the problem at the intermediate level since this is where most textbooks and programs begin more formalized presentation of map usage.

¹ Ralph C. Preston, Teaching Social Studies in the Elementary School (New York: Rinehart and Co., 1951), p. 224.

² Preston E. James, "The Hard Core of Geography," in New Viewpoints in Geography, ed. Preston E. James (Washington D. C.: The National Council for the Social Studies, 1959), Twenty-Ninth Yearbook, p. 1.

³ Lillian G. Witncki, "Section Four: Map Reading Skills," in Social Studies in Elementary Schools, ed. John Michaelis (Washington, D. C.: The National Council for Social Studies, 1962), Thirty-Second Yearbook, p. 197.

Need for the Study

As studies have shown a need for excelling in the use of maps, they have also pointed out a failure on the part of most schools to successfully instruct map reading skills. Because of the lack of systematic planned programs, interrelated purposeful learning, and continued instruction in the area of map reading skills this study is needed. Repeated studies have shown failure in map reading.⁴ These failures are due to improper and premature presentation and to a lack of map reading readiness.

Special efforts must be made to develop particular skills at the time when the student is capable of understanding a certain concept.⁵ The kindergarten must begin the readiness program with the primary grades supplying a good solid foundation on which the intermediate grades can build. No teacher expects proficiency in reading until the pupil has had careful instruction and extensive practice, yet many pupils are forced to utilize maps without acquiring the necessary skills.⁶

It is essential that one understand the relationships that exist between map reading skills and other areas of the

⁴ Edgar Wesley, Teaching Social Studies in Elementary Schools (Boston: D. C. Heath and Co., 1952), p. 358.

⁵ Clyde F. Kohn et al., "Interpreting Maps and Globes," in Skills in Social Studies, ed. Helen Carpenter (Washington, D. C.: The National Council for the Social Studies, 1953), Twenty-Fourth Yearbook, p. 146.

⁶ Wesley, p. 358.

curriculum. Interrelated learning is necessary. Instruction in map skills should be given at a time when the children are called upon to consult a map for some specific purpose.

Students must see a purpose in what they are doing. Thus, a particular map skill might be better introduced and studied in a science or arithmetic class, etc.

This study is concerned only with the intermediate grade level because it is here that the schools begin a more formalized approach to the instruction of map reading skills and understandings. As McAulay pointed out in his study, a more elaborate and formal program for the teaching of map skills begins in the fourth grade when the pupil is initiated in the study of the globe.⁷ His investigation was made in 1963 to determine the importance and validity of teaching map skills in the fourth grade. It also pointed out that the average fourth grader was mature and capable enough to begin this formal study. The proper use of map skills did benefit the students in the school programs. More was retained when the skills were presented as part of an on-going unit. The study also found that some map skills are home learned but that without direction and co-ordination with the social studies program they often went astray.⁸

⁷ J. D. McAulay, "Map Learning in Fourth Grade," Journal of Geography, 63 (March, 1964), p. 124.

⁸ Ibid.

Procedure Used

In preparing this study the facilities of Booth Library at Eastern Illinois University were used extensively. General books on the teaching of social studies in the elementary schools, current periodicals, textbooks, teachers' manuals and workbooks for social studies in the elementary schools, and courses of study have provided the basis for the study. In addition, audio-visual catalogs and personal experiences in the classroom were used. Information from these sources was reviewed and brought together to form this study.

Definition of Terms

The following definitions are pertinent to the understanding of this study. According to Sabaroff, "A map is a shorthand record of a mass of geographic knowledge." Wesley agrees in his definition, "A map is a representation of a part of the earth's surface. It is a condensed and complicated form of communication." Preston views the map as, "Scaled down drawings of the earth's surface or portions thereof." Another term which requires defining is globe. When speaking of maps in general the globe is to be thought of as a special type map. Preston agrees with other current sources when he

⁹
Rose Sabaroff, "Improving the Use of Maps in the Elementary School," in Readings for Social Studies in Elementary Education, ed. John Jarolimer and Huber M. Walsh (New York: The MacMillan Co., 1965), p. 243.

¹⁰
Wesley, p. 358.

¹¹
Preston, p. 268.

says, "Globes are scaled down models of the earth."¹²

When referring to map reading skills, it should be defined as the ability to use one's knowledge and interpretative ability to read maps. "Learning to read and interpret a map or globe,"¹³ is a basic definition given in the Thirty-Second Yearbook. Understandings differ somewhat from skills in that a skill is more or less a physical act whereas understandings are the comprehension and interpretation which accompanies the physical act. Understandings cannot be pulled from the air and they should not be memorized or recited. According to Dunfee, "They take on meaning only if there is a supporting body of knowledge achieved through a variety of experience."¹⁴

¹²

Ibid.

¹³

Millard Black et al., "Skills and Processes in the Social Studies," in Social Studies in Elementary Schools, ed. John Michaelis (Washington, D. C.: National Council for the Social Studies, 1962), Thirty-Second Yearbook, p. 163.

¹⁴

Maxine Dunfee, "Evaluating Understandings, Attitudes, Skills, and Behaviors in Elementary School Social Studies," in Evaluation in Social Studies, ed. Harry D. Berg (Washington, D. C.: National Council for the Social Studies, 1965), Thirty-Fifth Yearbook, p. 160.

CHAPTER II

ORGANIZATION OF A PROGRAM

General Objectives

The most significant aspect of a map reading program is a set of objectives. Recently published materials present a variety of objectives for the map reading skills and understandings. The skills and understandings of the map reading program are interrelated and interdependent. Most recently published materials list the same basic areas of learnings as objectives of the total map reading program. According to Sabaroff there are five basic objectives to be gained in a map reading program: location, orientation and direction; knowledge of symbols; understanding of scale; awareness of relative location; and the globe should be recognized as a model of the earth.¹⁵ Robert Mangine judged only the following three to be basic objectives of a program: directional orientation;¹⁶ symbol clarification; and scale knowledge. These objectives as listed above appear to be the basic areas of learning for most map reading programs.

¹⁵ Sabaroff, p. 244.

¹⁶ Robert Mangine, "Map Thinking and Map Making," Instructor, 72 (February, 1963), p. 128.

Development of the location, orientation, and direction concept should begin with a globe. Markable globes are useful in teaching this concept. Care must be taken in introducing the cardinal directions on maps. Laying the map on the floor and orientating the students to the true directions is helpful. Avoidance of up and down when referring to directions is also necessary. Regardless of procedure used, children should develop the ability to read directions without regard as to the position of the map.

Knowledge and understanding of the symbols can make the map come to life in terms of reality. In order to teach the meaning of symbols it is necessary to provide either real or vicarious experiences with the physical and man-made features for which the symbols stand. Each time a new feature and symbol is introduced, no matter what grade level, the class should be given a chance to see it in reality, through photographs, in films, or drawings. Only through these experiences will these symbols contain meaning.

Understanding of scale is needed since maps are smaller than the area they represent. Even when working with the simple sand table map, the concept of scale must be understood. One method of explaining the concept is to have students relate experiences as to how things look from an airplane or tall building. If these experiences are not sufficient, aerial photos might be used. Distance enters into the picture as

students consider the distance on the map as compared to the true distance.

The ability to express relative location is perhaps one of the more important functions of maps. The development of this skill is dependent upon the distance between two or more places and the direction one lies in respect to the other. As with other map skills, this concept can be learned most effectively when associated with the child's immediate environment.

Globes are a model of the earth and should be used in building other understandings, attitudes, and skills. Even if a flat map is the basic tool being used, it is important to make the initial step of relating the map to the globe segment being studied.

Specific Objectives

In this study the objectives have been broken down into three basic groups, skills, understandings, and attitudes. Most current information available lists these as one. Specific objectives are different from general objectives in that they are itemized plans for the intermediate group. The general objectives were concerned with the total map reading program. The concepts or understandings are learned more effectively when they are a thoughtful reaction to the development of skills. As stated in the definitions, there is a difference between the learnings of each and for this reason separate lists have been formed. The section on attitudes is concerned with developing within the child an appreciation for maps.

Skills - Objectives

1. To know the four cardinal directions and their relation to the grid lines, the equator, and the poles
2. To know the intermediate directions of northeast, northwest, southeast, and southwest
3. To possess the ability to use the lines of latitude and longitude to determine direction
4. To possess the ability to use degrees when referring to latitude and longitude.
5. To possess understanding and skill in orientating oneself in a room, on a map, or a globe
6. To be able to locate various map items through the use of direction and symbolic knowledge
7. To be able to use miles and degrees to measure distance
8. To be able to use the great circles to find the distance between places on the globe
9. To have a thorough understanding and working knowledge of how to use the scale drawing
10. To make use of the legend or key in identifying map and globe symbols before reading maps
11. To recognize the common symbols in use on maps and globes; for example, those symbols used for cities, capitals, boundaries, rivers, roads, railroads, etc.
12. To be able to interpret relief as indicated by merged color

13. To be able to distinguish symbols and colors in use on specialized maps such as population, weather, etc.
14. Be able to compare size, elevation, products, distance, natural conditions, and shapes, when using two or more maps
15. Be able to relate new studies to other regions such as to our own United States
16. To construct maps of various types: pictorial, relief model maps, outline maps, and to make legends for own maps
17. To possess the skills which allow one to transfer knowledge and read many kinds of maps: pictorial, physical-political, physical, weather, moisture, population, relief outline, road, products, etc.

Understandings - Objectives

1. The globe is the most accurated representation of the earth
2. All north-south lines on the globe meet at the North and South poles
3. The equator is an imaginary line exactly half-way between the North and South poles
4. Every place has its own latitude and longitude
5. The Arctic Circle, Tropic of Cancer, Tropic of Capricorn, Antarctic Circle, and other latitude lines are an aid in figuring distance and climate on the globe
6. Lines of longitude extend from pole to pole

7. The poles are the axis for the earth

8. The revolution of the earth causes the seasons

9. The rotation of the earth causes night and day

10. Directions are not always along straight lines on a flat map

11. Some distortion occurs when a map is made

12. Location can be understood in relation to various level at which the skills and understandings are introduced.

13. Features on the earth's surface

14. A map shows the shape and the relative size of areas

15. Many different kinds of maps are made to show various

16. things about the areas being mapped

17. Physical and man-made features have names, indicated

18. in the legend or key

19. distance is presented. At the fifth and sixth grade levels

20. more emphasis is placed on the cultural features and how they

21. relate to the cultural features. Concepts of latitude and

22. to earth size

23. longitude, wind direction, ocean currents, and elevation

24. are developed. Since different areas of the world are studied,

25. The International Color Scheme shows land elevations

26. and sea depths

27. out the sequence of objectives at the present time.

28. Understanding of the various terms used in reading

29. maps is also necessary

30. sequence plan developed by a map-producing company. Objectives

31. Attitudes - Objectives

32. for two levels within the intermediate grades are considered.

33. 1. To instill within the student the idea that a map

34. Similar lists can be found in other current sources.

35. can aid in understanding our earth and its inhabitants

36. 2. To lead the students to appreciate the value of maps

37. in our society

Continents and oceans"

Rand McNally also has a well-balanced list of objectives for map skills and understandings at the intermediate level, grades five and six. It contains the same basic grouping as the beginner's level with the addition of two.

- "1. Shape and size of the earth
 - Circle measurement in degrees, minutes, seconds
 - Measurement of great circles in miles
 - Comparison of areas and distances
 - Satellite orbits
2. Direction
 - Direction on the globe or any map projection
 - Use of the compass, watch, North Star, noonday sun
 - Orientation of map or globe
3. Scale
 - Meaning of scale
 - Use of linear scale
 - Comparison of maps of different scales
4. Location
 - Latitude (grade 5)
 - Longitude (grade 6)
 - Description and significance of relative location
5. Earth-sun relationships
 - Rotation and time
 - Revolution and parallelism of the axis
 - Cause of seasons
6. Symbols
 - Relief as shown by merged colors
 - Special-purpose maps for climate, population, vegetation, agriculture, transportation, etc.
7. Recognition of countries, regions, bodies of water, cities, etc., as they are studied
8. Expression of ideas in map making
 - Showing direction of one place from another 18
 - Using symbols either original or conventional"

17 Ruby M. Harris, The Rand McNally Handbook of Map and Globe Usage (Chicago: Rand McNally and Co., 1960), pp. 23-24.

18 Ibid., pp. 71-72.

CHAPTER III

INSTRUCTIONAL PROGRAM

Methods

The successful use of maps requires that the previous objectives be met; however, there is a wide variety of methods and materials available for accomplishing this goal. Methods, according to Branom, are "The plans which a teacher uses in teaching. They are the means teachers use to get pupils interested and to keep them interested in activities which result in learning."¹⁹ In discussing methods which could be used, they are many and they will depend greatly on the teacher, the individuals in the class, the class, the school policy, the textbook being used, and the specific skill or understanding being taught.

In the first place the teacher should be thoroughly familiar with the subject matter to be taught and in what sequence and detail it is to be presented.²⁰ As with other skills and understandings taught, map reading must follow a pattern. The teaching of a map skill cannot and should not

¹⁹ Frederick Branom, The Teaching of the Social Studies in a Changing World (Chicago: W. H. Sadlier Co., 1942), p. 190.

²⁰ Clarence Odell, "The Use of Maps, Globes, and Pictures in the Classroom," in New Viewpoints in Geography, ed. Preston E. James (Washington, D. C.: The National Council for the Social Studies, 1959), Twenty-Ninth Yearbook, p. 205.

be isolated. ²¹ The methods used should be related to the social studies program or to the elementary curriculum in some manner. ²² Meaningful learning is achieved only when the skill building is integrated with normal content offered at each grade level. As is stated by Resnick, "Merging the skill with the subject matter enriches social studies instruction and helps preclude, (1) shallow, detached learning, (2) boredom stemming from lack-luster lessons, (3) student disillusionment over busy work, and (4) recoil and disinterest in subsequent map and globe usage." ²³

Map reading skills generally are taught best as a part of a unit. As Harris states, "The close relationship between historical events and the earth stage can be made a part of social-studies units." ²⁴ Questions and map exercises can be formed and used to expand the unit. They must be pre-planned in order to meet objectives set up by the unit and the map reading program. An example of this type question is given by Harris in a unit on "The Race for Silks and Spices." ²⁵

"Why were the goods from the Far East so expensive?

- a. Use the globe to show how you would go on a trip to the Far East. What direction will you travel? Will you be north or south of the equator? Tropic

21

Witucki, p. 197.

22

Ibid.

23

Abraham Resnick, "Merging Map, Man, and Media in the Elementary Social Studies Program," Journal of Geography, 62 (April, 1963), p. 171.

24

Harris, p. 63.

25

Ibid., p. 65.

- of Capricorn?
b. About how many miles will you travel?"

Other methods would include the use of current events as an avenue for map reading skills development. Maps can supply the setting for understanding current events. Relationships of current events to earlier events in history can also be established through the wise use maps. Integrating the development of this skill with other aspects, such as science or mathematics could be possible. For example, if a field trip were taken in a science unit the mapping of the trip and study following would be beneficial. The viewing of films and filmstrips could be used as ways of presenting certain skills and understandings and in motivating and stimulating new thinking. Games, such as a treasure hunt, would be another method of checking on or initiating new map reading skills. Here maps show up as a source of information. Methods which encourage students to consult maps for information aid in the building of skills. The social studies text and accompanying materials, such as workbooks, can be used effectively. This material allows for automatic follow-through provided the book is well-organized. The teacher's manual will give great assistance in determining objectives, procedure, and evaluation techniques for each map reading lesson.

The methods must be somewhat varied. Children need some change in the program if they are to be fully motivated

to active learning. No matter what methods are used, man and his activities must be included if the motivational element is to be present.²⁶

Materials

A wide variety of materials is available to the schools today. Many different materials and experiences need to be provided in order to reach all the students involved. Materials used should be selected in a thoughtful manner. Much evaluation of materials should be done before a choice is made. This section will discuss various materials: maps and globes, textbooks, supplementary books, films and filmstrips, programmed materials, and school magazines and facilities provided by the same. As each topic is presented, ideas for proper selection will be given, as it is impossible to evaluate all types of materials in the same manner.

Maps and Globes

Maps are classified and grouped in various ways. They may be grouped according to form and the way they are used. Branom has listed the following usage groups: the globe map, maps in textbooks, maps in atlases, wall maps, outline maps, maps in newspapers and magazines, road maps, and others.²⁷ This, of course, is not a complete listing of every place maps are found, but it shows the major locations. Another

²⁶

Resnick, p. 174.

²⁷

Branom, p. 155-156.

way to group maps is according to data shown. Here again there is quite a variety. Those most commonly used and referred to are political, physical, political-physical, relief, weather, climate, vegetation, product, transportation, land use, population, historical, and pictorial. Michaelis classifies maps in this manner: political, physical, physical-²⁸ political, economic, historical, and special features. In comparing these two lists, evidence of agreement is present. Michaelis has broader categories, whereas the other is itemized.

Maps to be used in the educational program should be chosen carefully after consideration of the objectives. Only those maps and globes designed with subject matter content and method of presentation in mind will be of aid to the teacher.²⁹ Harris suggests, "When you evaluate a map, you should follow the same general pattern of examination as for evaluating textbooks."³⁰ She outlines this pattern as follows:

- A. Content
 - Does the map contain the information needed?
 - Is it free from excess detail?
 - Do the colors and symbols conform to those generally used?
 - Is the map information correct and up-to-date?

²⁸ John U. Michaelis, Social Studies for Children in a Democracy, Recent Trends and Developments (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963), pp. 434-439.

²⁹ Odell, p. 205.

³⁰ Harris, p. 367.

- B. Readability
Are the main features legible at classroom distance ?
- C. Pupil Interest
Is the map attractive in appearance?
Is the map at a level that the students can read, understand, and use?
- D. Teaching Effectiveness
This depends upon the features already mentioned namely grade content, readability, and interest quality. Size, accessibility, and convenience also influence this aspect.
- E. Globes
What has been said about wall maps also applies to globes.³¹

Other criteria which should be used in evaluation are suggested here. At early levels of presentation of a skill and/or concept, the map must be clear, easily read, and presented with only elementary information. The map must be related to the program with form of presentation appropriate to the group. The map should be carefully and accurately drawn. The symbols and colors on the map with corresponding symbols and colors on the key should be uncluttered and easy to read. The scale must be easy to follow. If the map is to be used by the whole class at a time it must be large enough to be clearly seen from all places in the room. Mounting and durability are also important when selecting a map.

Since a globe is also a map, most of the same criteria apply when selecting one. It should be large, 12-16 inches in diameter, for use in a classroom. Smaller ones, 8-10 inches in diameter, can be used for desk use. They must be durable and simplified with clear, easy to read, symbols, and colors.

³¹
Ibid., pp. 367-369.

The mounting preferred is usually the cradle and stand. This, of course, depends on the individual and the use he intends to make of the globe.³²

The first step in selecting maps and globes is to decide what purpose they are to serve. After proper evaluation the maps and globes can be purchased. Appendix A indicates those maps which should be in each intermediate classroom, or if infrequently used in a central location where it may be checked out. Many school systems will not be able to provide this number of maps for each class. The maps listed below will provide each classroom with the essentials. They are the minimum requirements needed in order to properly instruct a group in map reading skills.

1. Color relief globe, 12-16 inches in diameter
2. Physical-political United States map
3. Physical-political world map
4. World atlas

Companies which provide maps for elementary school use are listed in Appendix A.

Charts

A chart of commonly used geographical terms should be available in class size for each room. Individual sized charts should also be made available during introductory class work on terms. These charts can be obtained from most map-producing companies. Often times when pur-

chasing maps it is wise to purchase a chart at the same time from the same source to assure conformity in the material presented. One example of a company which produces this type chart is Rand McNally. They suggest it be used in the early stages of map reading in order to give the child experiences that will help him recall and visualize landscapes when he looks at maps. This chart, The Map Symbols' Chart,³³ has illustrations for concepts of six common symbols.

Teacher or class constructed charts are also useful, if properly made. They can become an integral part of the materials with relatively no expense. Pictures or photographs of actual conditions, (desert, products, rivers, etc.), can aid in creating a visual impression for the child when he uses the corresponding symbol.

Films and Filmstrips

This group of materials can aid in the development of map reading skills if the films and filmstrips are selected and shown with proper attitude on the part of the teacher and class. Basically when selecting films and filmstrips, certain criteria should be followed. Quillen lists four basic criteria for film and filmstrip evaluation. Three apply to our purpose: use of film should be related to purposes and objectives of skills and understandings being taught;

consider timing in the use of the film; and plan the film so it is related to class discussion.³⁴

Other guidelines for evaluation of films and filmstrips also mention clear sound and photography as criteria. In general it is important to remember that careful previewing and selection is necessary. Needs and problems of a particular group may necessitate different films and filmstrips. Appendix B contains an annotated list of films and filmstrips which are planned for intermediate grade use. Selection of films and filmstrips for the list was not based on previewing. The choice was made on opinions of reliable audio-visual departments and texts.

Books

The textbooks in the social studies will provide assistance in the teaching of map reading skills. Teachers' manuals generally review skills presented in each grade and the accompanying workbooks can also be valuable if used properly. After a study of several different series, it was found that most have a section on formal map reading at the beginning of fourth grade. When selecting textbooks the evaluation should consist of the following, according to Michaelis. He suggests using a checklist and rating each book according

³⁴ James Quillen and Lavonne Hanna, Education for Social Competence (Chicago: Scott, Foresman and Co., 1948), pp. 268-271.

to points. The following group of questions is his criteria for rating each text.

- I. "As an instruction resource:
 - A. Is it related to the content of the program?
 - B. Is it accurate and up to date?
 - C. Can concepts and understandings be grasped by children who will use it?
 - D. Is level of reading difficulty-vocabulary, style of presentation, sentence structure-appropriate for children who will use it?
 - E. Will it contribute to problem-solving skills?
 - F. Do illustrative materials--maps, pictures, drawings--contribute to the meaningfulness of the content?
 - G. Are study aids, suggested activities, and related references adequate?

- II. Physical features:
 - A. Is it attractive and appealing to children?
 - B. Are margins and page arrangements adequate?
 - C. Are size, spacing, and type size adequate?

- III. Major emphases:
 - A. Does the book inspire loyalty to American ideals and institutions?
 - B. Does the book contain material that can be used to develop positive attitudes?
 - C. Are generalizations supported by facts?
 - D. Are controversial issues handled fairly and objectively?
 - E. Does the book emphasize movements and trends rather than isolated events?
 - F. Does it stimulate interests that lead to further study?"³⁴

Textbooks, to be effective, must certainly do more than teach map skills. However, when considering texts, it is important that we evaluate the maps and how they relate to the rest of the book. Michaelis in statement I. F. suggests the importance of the relationship between the maps and the content. Another aspect of Michaelis's list which should be

given special consideration is statement I. C. The maps and map skill lessons within the text must present understandings which the children can utilize. Concepts and understandings will have meaning only if they serve a useful purpose for the individual.

Since this study is concerned with map skills, it is important to be concerned with the maps within a textbook. The quoted lists were general in their evaluation. Morris Sica suggests the following questions in evaluating the maps in a textbook: "(1) Is there at least one map for every important area considered in a textbook? (2) Are there maps that show small sections and others that cover broad areas? (3) Are different types of maps utilized for specific purposes? (4) Is there a progressive development of map skills?"³⁵

The list below indicates three series which have a developmental map reading program.

1. Follett Publishing Co., 1010 W. Washington Blvd., Chicago 7, Ill. The fourth grade book, Exploring Regions Near and Far contains an introductory unit on maps and globes and the skills needed to read them. Both the fourth grade book and the fifth grade book, Exploring the New World, continue development of unit one. Exploring the Old World, sixth grade book, contains an introductory unit on map skills. Each book has a companion workbook to aid in the development of the skill.

35

Morris G. Sica, "Do You Understand Your Social Studies Textbook?" The Social Studies, 50 (April 1959), p. 149.

2. Harper and Row Publishing Co., Evanston, Ill. Each book in the intermediate series contains work on map reading skills. The formal introduction to these skills is at the beginning of fourth grade in a special unit.
3. Scott-Foresman and Co., Chicago, Ill. The three books, In Our State, In the Americas, and Beyond the Americas have a progressive program of map reading skills. Introductory units are at the beginning of the fourth and sixth grade books.

Another area of books is the non-fiction book. Here the number specifically written to aid in developing map reading skills is small. Appendix C contains a list which is representative of those books that contain at least some discussion of this skill and understanding. These books must be evaluated as were the textbooks. The books listed were reviewed by the author in terms of their value to the map reading skills program.

Programmed Instruction

Programmed instruction is a systematic means of providing opportunities for individuals to learn through a step-by-step process. Subject matter is broken down into small learnable segments, placed in sequence, and arranged so that one step leads to the next. ³⁶ Michaelis describes programmed learning quite well in his recent edition.

"Programmed instruction is a systematic means of providing opportunities for individuals to learn without the presence of a teacher or tutor. A program is designed to begin with what the learner knows, to move by steps to new material, to give practice and review

on selected concepts and skills, and to evaluate progress. The learner makes responses to questions, proceeds at his own rate, and gets immediate information on the correctness of his responses. The program may be presented in a machine, in textbooks, on cards, on sheets, or in a film. However, these are only devices for presenting the program; the program itself is the heart of programmed instruction. In fact, some believe that the foremost contribution of current activities in programmed instruction may be increased knowledge of how to present subject matter."³⁷

At this stage not a great many programs have been formed for use in the elementary social studies program, for it is a relatively new addition to the area of instructional materials. Two programs have been written for intermediate grade level map reading skills according to recent materials. Basically when evaluating programmed material the following should be considered: (1) Is the material systematically controlled? (2) Does it really present materials that the objectives hope to accomplish? (3) Is continuous evaluation possible? (4) What is the content and upon what concepts was it built? (5) Are the physical qualities of the material attractive and substantial?

The following companies presently have programmed material on map reading skills for use at the intermediate grade level.

1. Science Research Associates, 259 E. Erie, Chicago 11, Ill. Multi level kits - "Map and Globe Skills"
2. Webster Publishing Co., St. Louis 26, Mo. Webster Social Studies Skills for grades five and six
 "Latitude" - 400 frames
 "Longitude" - 400 frames
 "Additional Map Reading" - 150 frames

Weekly Magazines and Associated Materials

These magazines are generally used in the area of current events; however, they often have a section which pertains to the development of map reading skills. Basically, they are well-written and are designed especially for the elementary school child. ³⁸ They have up-to-date maps and some include a large weekly news map which can be used to improve student's competence in map reading. Both the Weekly Reader Series and the Scholastic Magazine Series have supplementary booklets or workbooks which may be purchased.

In selecting this type of material, it is necessary to select editions appropriate to the reading levels of the individuals in the classroom. Effective placement of the materials in the normal school session is necessary. The following materials are available.

1. American Education Publications, 1250 Fairwood Ave., Columbus 16, Ohio
My Weekly Reader - grades K - 6
Current Events - grades 6 - 8
Maps and Map Skills - grades 4 - 6
2. Scholastic Magazines Inc., 33 W. 42nd St., N. Y. 36, N. Y.
New Pilot - grade 1, News Ranger - grade 2,
News Trails - grade 3, News Explorer - grade 4,
Newstime - grade 5, Junior Scholastic - grades 6 - 8,
Study Skills Workbook Elementary Edition, Social Studies Skills Workbook - grades 5 up.

Evaluation

Evaluation is the method for determining how well the objectives of the map reading program have been met. As McAulay states, "Evaluation is the key to successful social studies teaching. Without it the social studies is without a rudder, without a compass."³⁹ Evaluation is a broad term often miscalled measurement. Measurement is definitely more technical and must meet these criteria: (1) the test situation should be exactly repeatable, and (2) the test situation should be identical for all students in the group measured.⁴⁰ Evaluating skills does not meet these basic criteria; therefore, it must not be referred to as measurement.

Evaluation is an integral part of the learning process. It has no meaning unless it is directed toward assessing pupil progress as far as the objectives are defined. The map reading skills will be developed most efficiently when there is systematic instruction, immediate evaluation, and continuing application.⁴¹

Basically evaluation procedures can be divided into

39

J. D. McAulay, "Evaluation in the Social Studies of the Elementary School," in Readings for Social Studies in Elementary Education, ed. John Jarolimer and Huber Walsh (N. Y.: The MacMillan Co., 1965), p. 465.

40

Howard R. Anderson, "Evaluation of Basic Skills in the Social Studies," in Evaluation in Social Studies, ed. Harry Berg (Washington, D.C.: National Council for Social Studies, 1965) Thirty-Fifth Yearbook, p. 100.

41

Ibid., p. 102

three categories: co-operative evaluation, self-evaluation, and teacher evaluation.⁴² Co-operative evaluation comes about through discussion and critical study by student and teacher as to whether objectives are being met. Self-evaluation is difficult to motivate and achieve. Charts and checklists formed by the group may be used by the individual as a means of self-evaluation. By far the most common type of evaluation is that done by the teacher. The methods which the teacher may use are varied. They range from observation to the use of standardized tests. Informal test exercises to measure map reading skills may be found in the testing programs of both the American Education Publications and the Scholastic Magazine Publications. Each is offered as a regular part of the weekly news magazine.

One broad area of teacher evaluation is teacher-made tests. They may be as Christophel suggests: oral questions on the use of maps and globes, written answers to questions about the use of wall maps, or worksheets prepared with a map and questions.⁴³ Teacher made tests should meet certain criteria just as standardized tests. They must be meaningful to the child and teacher and be an integral part of the program.

⁴²

Dunfee, p. 157.

⁴³Edna Christophel, "Checking Map Reading Skills in the Elementary Grades," Journal of Geography, 60 (September, 1961), p. 286.

Another teacher evaluation and measurement technique is the use of standardized tests. They are helpful in determining progress over a period of time. Careful review by the teacher and a study of the specialists' opinions should be made when selecting a test. Oscar Buros has a series of Mental Measurements Yearbooks which give the specialists' views on the varied tests. Criteria which should be used to review tests are validity, objectivity, reliability, expense, ease of administering, appropriate level, and whether or not it measures according to the objectives set up. In addition to these basic criteria which most references suggest, Michaelis lists several additional questions which should be used in selecting standardized tests in social studies.

"Questions of prime importance are:

Is this test related to the social studies topics being considered?

Does this test cover the key learnings of importance to the children for whom it is intended?

Is the level of difficulty appropriate for the children?

Is this test the best available one for this purpose?

If norms are to be used, are they suitable in terms of local needs and conditions?

Can the test results be used with other information to assess children's progress?

Does this test fit into the total pattern of evaluation?"⁴⁴

In preparing this study three basic tests suggested for evaluating map reading skills have been reviewed. They are listed with comments provided to further aid in the selection of one. These three tests were selected because of their widespread use and acceptance.

⁴⁴ Michaelis, p. 602.

Iowa Every Pupil Tests of Basic Skills: Test B - Work Study Skills

6 scores, one of which is map reading

\$.63 per 25 I.B.M. answer sheets

\$.40 per set of stencils for machine scoring of answer sheets

Elementary Battery (grades 3-5) 55 minutes to administer

Advanced Battery (grades 5-9) 90 minutes to administer

The norms are based on a midwestern population. Both forms include items designed to test ability to visualize a represented area and to read directions correctly, to recognize and interpret standard map symbols, to identify and visualize with the use of key symbols that are not standardized, and to apply knowledge of physical facts in the interpretation of map situations. The Elementary Battery is neatly drawn and clearly readable. The Advanced Battery has items to test ability to get facts and information from parallels and meridians and to read and interpret facts from pattern maps. Some experts question the use of the Advanced Battery at the fifth grade level.⁴⁵

Metropolitan Achievement Tests: Social Studies

2 scores, information and study skills

\$4.60 per 35 tests; may use separate answer sheets

\$1.75 per 35 I.B.M. answer sheets

\$.20 per scoring stencil

\$1.20 per manual for interpreting

Intermediate Social Studies Test (grades 5-6) 52 minutes to administer

The first part of the skills test is concerned with map reading and interpretation. The pace is approximately one question per minute. The questions are well-constructed. There is considerable overlap between the forms in the intermediate and advanced tests having the same letter designation, but there is none between forms with different letter designations.⁴⁶

⁴⁵

Oscar K. Buros, The Fourth Mental Measurements Year-book (Highland Park, N.J.: The Gryphon Press, 1953), pp. 32-42.

⁴⁶

Oscar K. Buros, The Sixth Mental Measurements Year-book (Highland Park, N.J.: The Gryphon Press, 1965), pp. 109-129.

Stanford Achievement Test: Social Studies

2 scores: content and study skills
\$8.00 per 100 for I.B.M. and MRS answer sheets
\$1.60 per 100 for hand scoring
Intermediate I Battery (grades 4-5,5)
Intermediate II Battery (grades 5,5-6,9)

The study skills section deals with tables, graphs, maps, political posters, bibliographies, book indexes and library index cards. There is a most unusual set of maps in the Intermediate II Battery. In answering questions, pupils are required to relate information from three different kinds of maps from the same hypothetical area. A map exercise such as this, which interrelates the rainfall, products, political and physical characteristics of an area can be a model for improving the use of maps in the classroom.⁴⁷

⁴⁷
Ibid., pp. 1220-1224.

CHAPTER IV

SUMMATION STATEMENTS

Summary

Map reading skills are important and emphasis must be given to their development. The need for such a program in the intermediate grades has been indicated by the age in which we live. Nearly every American finds it necessary to rely on map skills at some time during his life. In fact, with the emphasis on the world and its geography, most individuals face this daily.

A sequential program, not one beginning at grade four, is necessary. Research has indicated a failure of students in their ability to correctly read and interpret maps. Part of this failure is due to the lack of a systematic program. Objectives are the key to the establishment of a good map reading program. The methods, materials, and evaluation procedure must work toward the objectives. This should be done as a part of a total social studies program with activities being on-going. Variety in methods, materials, and evaluation provides the teacher with a means for reaching all levels of development.

It is through these means that the schools can provide a map reading program that will realize the objectives set up and will give the individual the necessary skills needed in his future life.

and certainly will continue to be an important skill in the future.

Teachers and administrators need to co-operate in setting up definite objectives for the system. This will require study and effort on the part of each individual involved. If this cannot be done as a system-wide project then individual buildings or individual teachers should work out a program for themselves. Map reading must be fit into the total social studies program just as the whole area of social studies, to be effective, must be incorporated into the curriculum. It is not an isolated skill with no relation to other areas of endeavor.

Materials used will depend on the teacher and particular situations in which he is involved. Basic maps and globes must be part of the program. All supplementary materials available should be carefully considered before use. It is impossible to recommend specifics since specific situations are unknown. Methods, again, will vary. Basically, the teacher must be interested in doing his job well and should have a good background in this area. Individual study and preparation or if possible a community in-service program should be used to fully acquaint teachers to the needs, objectives, methods, and materials for a systematic map program.

Evaluation of the present program should be a first

step in setting up a program. If the school is already using a standardized achievement test, it should be reviewed and evaluated by the teachers with the use of Oscar Buros, Mental Measurements Yearbook. If the map skills section is satisfactory, it could serve as a basis for establishing immediate standards. If an achievement test is not used or if the one in use is not satisfactory, another map reading skills test should be used. Those mentioned in the evaluation have proven their worth and value in this area.

These recommendations are based on the findings of this study. The findings are general enough that they can be of use in any map reading program in the intermediate grades.

APPENDIX A

Maps for Use in the Intermediate Grade Classroom

1. A simplified, color relief globe
2. A markable outline project globe
3. A clearly marked physical-political globe
4. Simplified desk globes for individual use
5. A washable outline map for the areas being studied
6. Physical-political maps of the areas being studied
7. Outline maps for desk and wall use
8. Raised relief map for the United States and the continents
9. Special maps to show historical voyages, discoveries, resources, population distribution, products, land use, etc.
10. A road map, if studying the United States or local area
11. Polar maps to show trade routes and great circle routes
12. A desk atlas
13. A reference atlas
14. Transparency maps of areas being studied

Producers and Distributors

1. American Map Company, 16 E. 42nd St., N. Y., N. Y.
2. George F. Gram Co., Inc., 730 Washington St., Indianapolis, Indiana
3. C. S. Hammond and Co., Inc., Maplewood, N. J.
4. A. J. Nystrom and Co., 3333 Elston Ave., Chicago 18, Ill.
5. Rand McNally and Co., 536 S. Clark St., Chicago 5, Ill.
6. Replogle Globes, 315 N. Hoyne Ave., Chicago 12, Ill.
7. U. S. Government Printing Office, N. Capitol and H Sts., Washington 25, D. C.

APPENDIX B

Films

Rental films: These films may be obtained for a nominal fee from Indiana University Audio-Visual Center at Bloomington, Indiana. The following abbreviations will be used: min. - minutes, sd. - sound, c. - color, b. & w. - black and white.

1. Globes: An Introduction, 10 min. sd., c. or b. & w. Pictures the globe as a model of the earth and points out the representative shape and color of land and water areas. Identifies the continents and compares their size and location. Explains the poles and scales of latitude.
2. How Far?, 10 min., sd., c. or b. & w. Describes through the experience of children on two separate trips the meaning of distance, maps, and speed.
3. How We Know the Earth's Shape, 10 min., sd., c. Reviews past and present theories about the earth's shape, and describes the means of gathering scientific evidence, including use of earth satellites.
4. Maps: An Introduction, 12 min., sd., c. or b. & w. Describes how maps are made by picturing a class constructing a map from a model of the community. Show the use of a legend and how a scale is derived.
5. Maps and Their Meanings, 15 min., sd., c. Interprets cartographic devices including colors and symbols, used to indicate the physical characteristics of land. Illustrates how such factors as rainfall, altitude, and latitude determine land use.
6. Maps and Their Uses, 11 min., sd., c. or b. & w. Shows the meaning and uses of maps through the story of a family seeking a home site. Explains the significance of some of the symbols used, and describes maps made for specific purposes such as the contour map or road map.

7. Maps Are Fun, 11 min., sd., e. or b. & w.
Introduces the fundamental concepts of map reading. The sand table is utilized. Principles of scale, symbols, physical and political maps, color uses, and how to use a map index is shown.
8. Our World, 18 min., sd., e.
Documents the activities of an intermediate grade class as they learn about the world through the construction of a globe, four feet in diameter.
9. Reading Maps, 11 min., ed., e.
Shows the importance of knowing how to read road signs and how sign language is used on maps. Aerial photos are used to depict the mapping of a valley. Shows the work of surveyors gathering data for maps. Points out the use of scale.
10. Understanding a Map, 12 min., sd., b. & w.
Uses graphic illustrations to diagram the fundamental points involved in map reading and traces a route for children to follow from church to home and school. Describes scales, symbols, and conversion of aerial photos to maps. Relief, physical, and political maps are excellent.
11. Using Maps - Measuring Distance, 10 min., sd., b. & w.
Shows how to measure distance and the use of scale. Points out the differences between large and small scale maps and specifies how, when, and why two types of maps can best be utilized.
12. What is a Map?, 10 min., sd., b. & w.
Shows how a map is made beginning with an aerial view.
13. Which Way?, 9 min., sd., e. or b. & w.
Explains the meaning of directions. The relationship of the sun to cardinal direction and movement of shadows during the days is described. The use of the compass is demonstrated.

Films which may be purchased: The company which publishes the aid is listed below. Abbreviations are the same as for rental films.

1. Global Concepts in Maps, 11 min., sd., e.
Shows how map projections have been designed and

improved to meet different uses. Cornet Films,
65 E. South Water St., Chicago 1, Ill.

2. Latitude and Longitude, 9 min., sd., c. or b. & w. Illustrates with a globe the meaning of latitude and longitude readings. United World Films, Educational Films Department, 542 S. Dearborn St., Chicago, Illinois.

Filmstrips

Filmstrips which may be purchased: Abbreviations used are as follows; fr. - frames, c. - color, b. & w. - black and white.

1. Exploring through Maps Series: McGraw Hill Text Films, N. Y.
 1. Let's Read Our Maps - c.
 2. Maps and Men - b. & w.
 3. Flat Maps of a Round World - b. & w.
 4. Maps and Their Meaning - c.
 5. We Live on a Huge Ball - b. & w.
2. How to Use Maps and Globes Series: McGraw Hill, N. Y.
 1. Maps: What They Are - c.
 2. Map Symbols and Terms - c.
 3. Globes: Our Most Accurate Maps - c.
 4. Maps: Their Types and Uses - c.
 5. Latitude and Longitude - Finding Places and Direction - c.
 6. Latitude and Longitude - Time Zones and Climate - c.
3. Introduction to the Globe Series: The Jam Handy Organization, Detroit
 1. Continents and Oceans - c.
 2. North, South, East, and West - c.
 3. Up and Down - c.
4. Introduction to Maps Series: Jam Handy Organization, Detroit
 1. What is a Map? - c. - 27 fr.
 2. Land Forms and Their Symbols - c. - 31 fr.
 3. Coast Lines and Their Symbols - c. - 27 fr.
 4. Lakes, Rivers, and Their Symbols - c. - 30 fr.
 5. Towns, Cities, and Their Symbols - c. - 30 fr.

5. Learning to Use Maps Series: Encyclopedia Films, Inc.,
 1. Reading Directions on Maps - c. - 47 fr.
 2. Measuring Distances on Maps - c. 47 fr.
 3. Locating Places on Maps - c. 47 fr.
 4. Reading Physical Maps - c. - 47 fr.
 5. Reading Political and Economic Maps - c. 47 fr.
 6. Studying an Area Through Maps - c. - 47 fr.

6. Maps and How to Use Them Series: Eye Gate House, Inc.,
Jamica, New York
 1. What a Map Is - c.
 2. Elements of a Map - c.
 3. Using Common Maps - c.
 4. Maps of Physical Features - c.
 5. Maps for Special Purposes - c.
 6. The Globe - c.
 7. Using the Globe - c.
 8. Flat Maps of a Round Globe - c.
 9. Maps for the Air Age - c.
 10. Maps Through the Ages - c.

7. Maps, Symbols, Dots, and Lines: Society for Visual
Education, Chicago 14, Illinois
60 fr. - c.

8. Where People Live and Work: Society for Visual
Education, Chicago 14, Illinois
60 fr. - c.

APPENDIX C

Non-fiction Books

1. Colby, Carroll B. Mapping the World, Coward-McCann, 1959. The book is a pictorial review of a global mapping project of the Corps of Engineers. It explains how maps are made. It is not primarily concerned with map skills but presents a good background in the area of maps.
2. Epstein, Sam and Beryl. The First Book of Maps and Globes, Franklin Watts Inc., N. Y., 1959. A beginning book on how to read maps. Simple street maps are introduced. Charts showing depth of water and currents and contour maps are discussed.
3. Hackler, David. How Maps and Globes Help Us, Benefic Press, 1962. How we use globes and maps is discussed. Position, direction, distance on maps is discussed. How maps are made, their colors and symbols, and a summary is presented.
4. Hammonds Illustrative Atlas for Young America, C. S. Hammond Publishing Co., Maplewood, N. J. The book has a good section on maps and how to use them. Kinds, scale, symbols, etc. is brought out in this section.
5. McFall, Christie. Maps Mean Adventure, Dodd Mead and Company, N. Y., 1961. A history of maps is given as well as how to map various areas such as the sea and space. Explanation of various map symbols is also given.
6. Marsh, Susan S. All about Maps and Map Making, Random House, N. Y., 1963. The book presents an explanation of types of maps from road to sea and air maps. Some information is given on how to draw maps.
7. Tannenbaum, Beulah and Stillman, Myra. Understanding Maps, Charting the Land, Sea and Sky, McGraw Hill Co., N. Y., 1957. Explanation of why we have and need more maps. Directions for how to find latitude and longitude are given.

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