THE UNIVERSITY OF MANITOBA

A MODEL OF PROCEDURE FOR THE CONSTRUCTION OF SLIDE SERIES BY THE TEACHER FOR THE PURPOSE OF STUDENT CONCEPTUAL DEVELOPMENT

by

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FOR OLIVE HOGUE

ABSTRACT

Resources directly influence the objectives or goals of a curriculum. The resource being discussed is the visual medium in the form of slides. This medium must be constructed to provide a learning experience for conceptual development for the student. With the curricular revisions in the Social Studies, specifically history, and the emphasis upon conceptual development, expository learning materials such as commercially produced slides are inadequate for this task. New resources must be constructed and the teacher, who realizes the needs of the students, must assume responsibility for this construction.

The learning goal and objectives are established from the concepts to be developed and the learning processes to be utilized by the student. The problem was one of how to construct resources to achieve the required objectives. On that basis the teacher makes the selection of slides for slide series production. Therefore, the major purpose of the study was to construct a procedural model that can be applied to the history courses at the junior high level to provide an answer to the problem. The second purpose was a practicum aspect which implemented the procedure in a practical application and utilized the suggested technical skills in the construction of seven slide series.

The procedure was organized in the following manner. The concepts to be developed through the use of slides as a learning strategy were selected. The content data necessary for concept development was prescribed by the junior high Course of Study guidelines. The learning

goal and specific learning objectives were determined by each slide series. The learning processes utilized were dependent upon the cognitive structures of students at a junior high school age.

The outcome of the procedure was the actual slide selection. The transactions within the procedure were the selection of content and learning processes, based upon a diagnosis of student cognitive structures. The slides selected did not simply meet content demands but were selected to provide a learning experience to achieve learning objectives and goals. The outcome of the application of the slides to the classroom would be the actual creation of a learning experience for the student to interact with and exhibit the desired and determined behaviors.

TABLE OF CONTENTS

CHAPTER PAGE

LIST OF FIGURES

FIGURE PAGE

LIST OF TABLES

LIST OF MATRICES

CHAPTER I

THE PROBLEM

Introduction

Material resources are increasingly being utilized in the Social Studies classroom. Resources, and their particular orientation toward teaching and learning, directly influence the objectives or goals of the curriculum. New curricular projects developed for the Social Studies in the last decade state that the development of concepts through skills in inquiry, critical thinking and problem solving is a major objective in learning and in curricular planning. Resources designed for the purpose of presenting content data in a general sense for no specific curricular objectives are inadequate for achieving objectives of conceptual development. Materials must be constructed to satisfy objectives of a particular curriculum.

One type of material resource is the visual medium. This medium is generally regarded as a 'visual aid' to teaching and learning. Consequently, visuals are placed in the position of acting as a stimulus to learning or as a reinforcer for internalized learning. Visuals can become more than this; they can become an integral part of the teaching-learning process.

Education with its theories of teaching and learning is in a process of change demanding creation or revision of curriculum. An important element in the change in existing Social Studies curricular projects will commence with a revolution of the materials and their

uses. (Fenton, 1967) New curricula are needed to meet the changing demands of the 1970's, the demands of the student, of society and of the knowledge explosion. This revolution must be met, influenced and controlled by the classroom teacher. One aspect of this control is the assumption of responsibility for determining what resources enter the classroom, their construction and their application.

The majority of the visuals, such as slides, available to today's classroom are of the commercially produced variety. They are marketed for a mass audience with a major aim being the realization of profit. They are designed for multi-level usage and have not been produced for the objectives of a specific curriculum. The trend in these slides has been to display factual information to a non-participating audience.

Factual content in the new Social Science curricular projects is not being taught as an end in itself, but for the development of concepts. This is especially the case in history. Visually displayed data in commercially produced slides is not geared for conceptual development or for the use of inquiry skills by the student. If the displayed data from commercially produced visuals is applied to the learning of concepts for a given curriculum and grade level, much of the information will be irrelevant, with needed information not supplied. Because of the orientation toward a diverse range of grade levels, content supplied by the commercial product will not be directed to conceptual development of a given student or classroom group. This may create interference to learning as the result.

Many of the slides used in the Social Studies classrooms of Manitoba are produced in the United States and are oriented to an American audience, with American philosophies of education influencing construction of the materials. The slides reflect the individual company's interpretation of these philosophies in light of their profit motive. It cannot be denied that commercially produced slides will provide learning experiences, but their function in providing experiences for conceptual development is limited. The role of the teacher is relegated to a secondary position in the choice of the content displayed. Most important, the needs of the students are not considered in the process. The student is considered as a consumer of a product, rather than as an individual involved in learning.

Background to the Problem

The visual medium used within the classroom must be developed to achieve the learning objective of conceptual development through the use of inquiry skills. With the curricular revisions in the Social Studies and their emphasis upon conceptual development and critical thinking, expository teaching strategies and expository materials utilized for the objective of the simple acquisition of knowledge alone, are not satisfactory. New materials are needed to satisfy changing objectives and changing teaching strategies. To meet these changing demands, new materials must be constructed to meet these objectives, and the teacher must assume the responsibility of constructing these materials.

Statement of the Problem

In Manitoba the teacher is provided with a course of studies by the Department of Education, which outlines the history courses offered at the junior high school level. Each outline lists the content and topics that are suggested coverage for that specific course. The teacher must determine the concepts to be developed as determined by the learning objectives and the learning resources to be utilized in a selected instructional strategy that are necessary for the student to achieve these objectives. These determinants are dependent upon the immediate needs and previous learning experiences of the students.

The problem is one of how to construct resources to achieve the required objectives. Specifically, on what basis does the teacher make the selection of visual materials for the slide series in order to satisfy predetermined learning objectives where the learning objectives are the development of concepts through the use of inquiry skills by the student? The concepts are drawn from the Social Science disciplines and the Junior High history courses provide the content materials necessary for the development and application of the concepts.

The major purpose of the study is to construct a procedural model that can be applied to the history courses at the junior high level to provide an answer to the problem. This procedure will be determined by

answering the following questions:

1. What are the concepts to be developed through the use of a visual resource as a teaching strategy?
2. How are the learning goals or objectives determined and what is their role in the procedure?
3. What is the procedure for the construction of the visual resource, a slide series, to satisfy the learning objectives?
4. What are the technical skills and tools required by the teacher to construct the slide series?

The second purpose of the study is the practicum aspect of the procedure which utilizes the technical skills in the construction of seven slide series. Each slide series is designed to provide learning experiences for the development of a concept. This will allow for an assessment by the reader of the procedural method established in the study.

Limitations of the Study

1. If commercially produced visuals are developed for a specific learning objective and are developed by educators and technical specialists, then these visuals will be of a superior nature to achieve conceptualization. This will be due to the fact that the classroom teacher has limited time, resources and facilities to achieve production of a highly sophisticated nature.

2. The individual slides provided for demonstration of the procedure in operation were selected on the basis of their interpretation by the author. This interpretation is partially an affective decision made by the teacher who decides that the visual image presented by the slide would achieve the learning objective.
3. The slide series developed were not implemented in the classroom due to time limitations and the belief that this implementation would assume, in totality, the nature of a further and complete research topic.

Delimitations of the Study

1. Only the cognitive domain of learning will be dealt with in the learning objectives established for the purpose of the paper.
2. The course topics provided in the course of study guides established by the Department of Education limited the choice of concepts and limited their application to what was prescribed by the curriculum branch. Admittedly, other history guides exist at the junior high level, for example Indian and Metis studies. As well, many schools do not follow the guides in their entireties due to adaptations made for specific needs of a given area.
3. The technical procedures outlined are based upon methods and tools found most effective with a minimum of skills required, although other methods and other types of tools are available.

4. No reference in the study is made to the junior high geography course, which is the other discipline area of the complete Social Studies course for junior high studies.

Theoretical Assumptions of the Study

1. A major weakness of commercially produced slides is in their classroom application. Unless a teacher edits, deletes or provides supplementary material to reduce weaknesses, the series, shown in its entirety will, in fact, be in control of the experience. Irrelevant visuals not necessary for the achievement of the goal will distort the learning goal. Omission of visuals necessary for the student to achieve the goal will influence goal attainment.
2. Visually presented material creates an experience for the learner. This experience provides a basis for conceptualization to occur. It is not guaranteed as to what the experience will be in totality but the slide experience is one of guided discovery or guided experience in which the teacher must assume the responsibility of predicting the behavior of the student. No matter what the teaching strategy, the learning experience is subject to variables which exert their influence.
3. The atmosphere of the classroom is one in which learning through visually displayed materials is accepted and appreciated; one where through the presentation, the student feels

> he has touched reality and has experienced something that is tangible which he can relate to. Visuals bring into the classroom the inaccessible—events, things and people far removed in space and time.

A Statement of Definitions

The following definitions are explained in specific reference to their use in the paper. Included are terms of a technical nature as well as those concerned with education, specifically cognition.

Aperture. The opening in a camera lens diaphragm through which light passes, the f-stop.

ASA (American Standards Association). Film speed, indicates the films sensitivity to light. The higher the number, the more sensitive the film requiring either a smaller f-stop or shorter exposure time.

Close-up lens. A supplementary lens that is placed in front of the camera lens to enable it to focus at closer than its normal range.

Cognitive Structure. The sum total of the learner's knowledge at a given time, specifically the totality and organization of one's learnings; totality meaning content and organization meaning classification system.

Color Balance. Refers to the ability of film to reproduce color as the eye sees it. Color films are balanced to certain light sources such as photolamp illumination, tungsten illumination or natural light illumination.

Color Sensitivity. Describes the response of a film to various colors. Color films respond to all colors (in various degrees depending on the film type) although the response can be affected by using a film not geared for a certain illumination.

Black and white films are divided into four general sensitizing classes:

1. Non-color sensitized or blue-sensitive films sensitive only to ultra-violet and blue-violet light.
2. Orthochromatic films sensitive to green light, ultraviolet or blue-violet.
3. Panchromatic films sensitive to all visible colors as well as invisible ultraviolet radiation.
4. Infrared films-sensitive to ultraviolet, blue-violet, deep red and invisible infrared radiation.

Continuous-Tone Original. Materials that have a graduation of tones between light and dark with few defined lines. Photographs and paintings are examples of continuous tone originals.

Copyboard. An illuminated board or easel set up to which the original is attached for copying through a close-up procedure.

Depth of Field. Distance between points nearest and farthest from the lens that may be considered to be rendered acceptably sharp. (Refer figure 1)

DEPTH OF FIELD

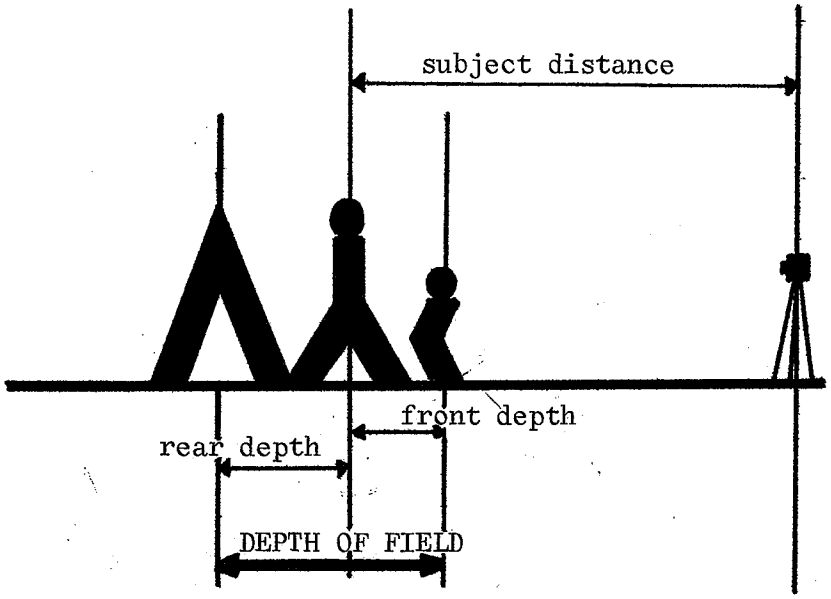

FIGURE 1

The depth of field is the range that appears in sharp focus for any particular distance and diphragm setting (f-stop). There is relatively very little depth of field in the case where close-up objects are focused on, and a great depth of field where distant subjects are in focus. Using a smaller lens aperture increases the depth of field and opening the aperture reduces it. The depth of field also varies with the lens used. Wide-angle lenses have great depth of field while telephoto lenses provide lesser depth of field.

Duplicating. Making copies of slides.

Exposure. The amount of light reflected by a subject or the amount of light incident to the subject.

Exposure Meter. (light meter) is a measuring device either built into the camera or separate from the camera that measures the amount of light reflected by a subject or incident to the subject.

Film Speed. Measure of sensitivity of film to light; usually expressed as ASA.

Filter. Films are balanced for specific light sources. When a light source is used that is different from the one in which the film is balanced, a filter is used to adjust the color quality of the light in order to get correct color rendition. Filters are also used to change the emphasis of certain colors making them reproduce differently than normal and to produce special effects.

Field Size. Area covered or seen by a camera lens at a given distance from the subject.

Focal Length. Distance from the optical center of the lens to the film in the camera body when the lens is focused at infinity.

Focus. The meeting point of converging light rays from a lens. When the lens is focused, the image it sees should be of excellent definition.

F-stop. The size of the lens opening, the smaller the number the larger the opening.

Learning. A process in which there occurs a change in behavior or the creation of a behavior through interaction with the situation or environment. Overt behavior can be measured or evaluated. The behavior or change in behavior does not necessarily have to be permanent.

Learning Experience. The interaction occuring between a learner and the external conditions to the learner, his surroundings or environment. Specifically the interaction between the learner and the slides for the purpose of conceptual development.

Light Source. The type of light illuminating the original, object or event to be photographed which determines the exposure.

1. Daylight - natural light.
2. Tungsten light - light emitted by common household tungsten lamps (not fluorescent).
3. Photo-lamps - lamps available in color temperature of 3400° K require no filter on the camera lens with the Kodachrome II Professional film.

Line Originals. An original made up entirely of lines, not characterized by a graduation of tones. Documents, blueprints, typewriting are examples of line originals.

Media. Those things which have the ability to communicate or have the capabilities to communicate. Visual media is the emphasis in the study.

Original. The material to be copied.

Parallex. Difference in what is seen by the lens and viewfinder in the case of the non-single-lens reflex camera. Applies only in close-up photography.

Picture Definition. Clarity of detail in the photograph. The degree of definition is determined by:

1. Graininess - refers to the sandlike or granular appearance in the slide, usually graininess increases with increased film speeds (higher ASA numbers.)
2. Resolving power - the ability of a film to record fine detail.
3. Sharpness - the visual impression of good edge sharpness between details in the photograph - the boundary between dark and light.

Referent. The actual thing, person or event that is perceived by the learner. Visuals provide images of the referent which can be perceived.

Reproduction. The copy made by a close-up photographic process which is as accurate and as exact as possible. Specifically the reproduced copies are slides.

Shutter Release Cable. An extension cable that allows the shutter to be released at a distance from the camera.

Shutter Speed. The length of time the lens aperature is open. It determines the length of time the film will be exposed to light (exposure time).

Single Lens Reflex Camera (SLR). The type of camera in which the user sees in the viewfinder the image transmitted by the lens.

Skill. A human capacity or capability, specifically thought capacities or capabilities such as interpretation, synthesis or evaluation.

Slide. Image on a transparent base, intended for projection.

Still Projection Media. Media that transmits an image that is not capable of movement, in this case slides.

To Copy. To photograph flat originals or material, such as photographic prints, drawings, paintings, and documents.

Visual Medium. That method or type of communication which has the ability to communicate and has the ability to be observed.

Visuals. Those things which can transmit meaning by being observed. The visuals in specific reference to the study are slides.

35 mm. Camera. A camera that uses 135 film - film with a width of 35 mm.

Significance of the Study

The visual medium as a medium of communication is extremely popular as a method of instruction within the classroom. Students and teachers

are living in a highly sophisticated technological society. Much of the learner's experience outside the school environment is in mediated form. By the end of high school it is estimated that the student will undergo 15,000 hours of television experience, 500 hours of motion picture exposure and will only experience 11,000 hours in the classroom.[1] Thus within the classroom walls, visual experiences are accepted as relevant to student experiences.

Marshall McLuhan theorizes that we are entering a new era--the electronic age of film, television, phonograph and telephone. In this new age the book as the mainstay of education is being questioned. The print culture is being replaced by the electronic age with the classroom of today a mosiac of electronic and printed experiences. The medium itself has a 'message'. The media provide specific concrete experiences of the world and this specific mode of seeing the world is the message of the media.[2] McLuhan states that visuals provide 'concrete experiences' and conceptual learning theory states that conceptual development is based in the learning experiences of the student. This is the role and function of the visual medium--to provide these experiences, these concrete experiences for learning.

With the teacher in control of the visuals, the selection of visual content will be determined by the learning objectives and the concepts

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[1] John B. Haney and Eldon J. Ullmer, Educational Media and the Teacher (Dubuque: Iowa: W. C. Brown Co., 1971), p. 1.

[2] Marshall McLuhan, Understanding Media: The Extension of Man (Toronto: McGraw-Hill Book Co., 1962).

to be developed. Each individual slide will reflect the objectives. Headings and captions on most commercially produced slides present the learner with passive practice in listening or reading skills and evoke no inquiry skills necessary for conceptual development. Often the content is composed of hand-drawings or simulations rather than pictures of real objects and events thereby losing touch with reality, and not providing an adequate experience for conceptual development.

Commercially produced slides are inadequate to perform what is required of them for conceptual development. They must be replaced and the only substitute will be slides constructed for a specific curriculum and for specific students at a given level of development. Economically this is not feasible for the large producers except where a curricular project is adopted by a wide range of educational institutions. But a project adopted for a given area, a school district or division must be adapted to meet the local needs of the students, making many or some of the material resources inadequate. Thus the teacher must assume the responsibility for ameliorating the situation.

Plan of the Study

The study is organized into five subsequent chapters. Chapter Two consists of a review of the related literature and research applying to conceptual learning theory, the effectiveness of visuals and visual construction. Chapter Three presents, in summary form, an analysis of the constructed visuals located in Appendix C of the study. Chapter Four details the procedural method for slide construction for the purpose

of providing learning experiences to satisfy learning objectives. The technical procedure utilized in reproduction techniques and the tools required are presented in Chapter Five. Chapter Six concludes the study, discussing the implications of the procedural method to education and suggesting further areas of research necessitated by the limitations and delimitations of the study.

CHAPTER II

RELATED LITERATURE AND RESEARCH

PART I

Introduction

The thesis of the study is that the visuals must be constructed for specified learning objectives. These objectives require the use of learning processes for the development of concepts. This section of the study provides a background to the changing role of media in the new Social Studies curricular projects, the recent research completed on the effectiveness of various media types on learning with emphasis on still projection media, learning theory as applied to conceptual development, and the nature and function of educational objectives in the construction of visual resources.

Media and the Social Studies Curriculum

Tradition states the assumption that media are aids to instruction. Their purpose was one of a helper to the teacher in teaching and the learner in learning. Their place was the classroom and they were added to instruction after the planning of the instruction. The aid cannot become the teacher, and the relationship between teacher and aid was firmly secure. Heinich surveyed this trend and demonstrates its application to curriculum planning as diagrammatically explained in Figure 2. The A.V. materials were used as a teaching strategy within the classroom and were not constructed for the particular curriculum. They existed as an option

for teacher use and were not specially constructed for any specific demands of the classroom in which they were utilized.

With the use of television in education as a method of instruction, it became obvious to educators that media can be complete teachers and instruction. Programmed instruction was the ultimate of proof that instruction can be solely technological. Technology can exist alone in instruction and is an integral part in the teaching learning process, thereby attributing to the instructional media a new role in curriculum planning. Instructional media must be incorporated into instruction not as an aid, but must be incorporated into the instructional process as an integral factor at the planning stage. Figure 3 demonstrates this altered role of the media, where the A.V. materials are part of and influence the planning of the curriculum. The availability and type of media influences curriculum construction, teaching strategies and ultimately the type of learning within the classroom. Computers, language laboratories, and simulation games are representative of the new materials in A.V. instruction. Although it is not being suggested that technological materials function solely alone in instruction, it is being stressed that their importance is integral and vital. With their shift in role, audiovisual materials, and their ever widening scope of types, have earned a new name to denote their changing role in education--instructional technology.

New social studies curricula demonstrate this changing role of the media within the actual teaching learning process and the planning stages of this process. To appreciate the operations involved in

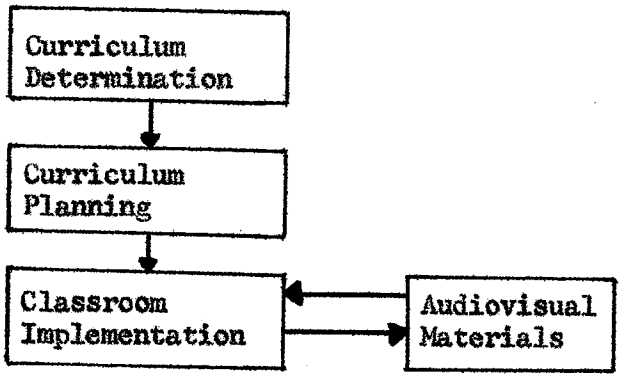

FIGURE 2

AUDIOVISUALS AND THE INSTRUCTIONAL PROCESS 1

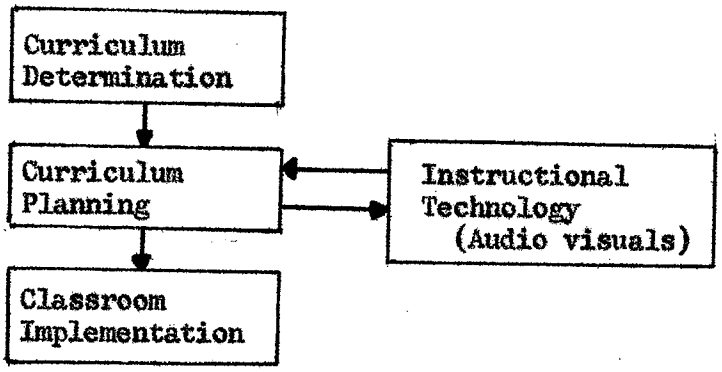

FIGURE 3

INSTRUCTIONAL TECHNOLOGY AND THE INSTRUCTIONAL PROCESS 2

[a]Robert Heinich, "The teacher in an Instructional System," in Frederick G. Knirk and John W. Childs, (ed.), Instructional Technology A Book of Readings. (New York: Holt, Rinehart and Winston, 1968), p. 48.

[b]Ibid., p. 52.

curricular planning, it is necessary to analyze the structure of the knowledge to be learned and the role the media plays in the teaching of this structure. The social studies projects emphasize conceptual development through a process of inquiry. These projects acknowledge the existence of a structure in the social science disciplines--a structure consisting of concepts and a method of inquiry. With media incorporated into the planning stages of the curriculum, the media must be designed for the learning of structure. Thus the greatest change in media function is that the media must be constructed for the purpose of conceptual development, not for the simple acquisition of factual data. The commercial visual media are not designed for concept development but are designed for the teaching of knowledge of content through expository teaching strategies. These visuals do not allow for the use of inquiry skills and critical thinking.

Social Education, April 1970, presented an article titled, "A Critical Appraisal of Twenty-Six National Social Studies Projects" which analyzed and reviewed new curricular projects developed in the United States within the last five years. These projects were either privately financed or government sponsored. The projects, such as "The Taba Curriculum Development Project," "Basic Concepts in History and the Social Studies," "The High School Geography Project, University of Colorado," "World Studies Inquiry Series" and many others being unique in their procedures, purposes, materials or content, displayed many similar

traits with a select few being:

> Concern for the structure of knowledge is characteristic of most projects. Many identify patterns of concepts and generalizations to be taught.
>
> The projects have developed a greater variety of materials. The single hard-covered textbook has been abandoned in many cases in favor of a pamphlet or booklet for each unit.
>
> Audiovisual materials and educational games are important parts of some projects.1

Lowe corroborates the above traits in his analysis of different contemporary projects. "The Harvard-Newton Project in Business History and Economics Concepts," "A Conceptual Framework for the Social Studies in Wisconsin Schools," "Identification of Major Social Science Concepts and Their Utilization in Instructional Materials," "Basic Concepts in History and Social Sciences," and many more reflect basic foundation ideas which elaborate upon the above listed traits:

> The content of the social studies program should consist of basic questions, understandings, concepts, principles, generalizations, and methods of inquiry or processes from history, geography, and the social science disciplines. These are the components of structure.
>
> The ideas and methods of the historian, the geographer, and the social scientist should be organized in a sequential, ordered manner to eliminate unnecessary duplication. ...it means reinforcing an understanding of basic concepts in a variety of contexts with every increasing sophistication.
>
> New kinds of teaching materials, approaches, and organization plans should be emphasized.2

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1 Norris M. Sanders and Marlin L. Tanck, "A Critical Appraisal of Twenty-Six National Social Studies Projects," in Social Education, April, 1970, p. 386.

2 William T. Lowe, Structure and the Social Studies, (Ithaca: Cornell University Press, 1969), p. 27-28.

Lowe regards the function of the structure of a discipline as providing a theoretical base for the curriculum. Fenton sees structure as a composite of two elements, a body of imposed conceptions which define the subject content and a procedure or method of how the concepts or conceptions are used or applied to achieve understanding. The concepts are determined and applied through a process of critical thinking or inquiry.[3]

Lowe asserts that a concept or generalization is valid to the learner only if he is aware of how the concept was conceived and how it relates to the other concepts; how it fits into the structure.[4] Bruner states the relationship between structure and learning. Structure helps students learn because learning will be more efficient if what is being learned is perceived as being logically organized. Also, if this relationship between learning and organization is perceived, learning will be more durable. Conceptual learning is vital since much of what is learned will be obsolete in the future but the concepts will not.[5]

The increasing focus upon concepts within the structure of a discipline for curricular planners is being more apparent as the new projects discussed emphasized. The organizational principles and the methodology of the "High School Geography Project, University of Colorado," are reflected in new geography units for Manitoba schools. The Report

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[3] Edwin Fenton, The New Social Studies (New York: Holt, Rinehart and Winston, Inc., 1967), p. 12.

[4] W. T. Lowe, op. cit., p. 50.

[5] Ibid., p. 50.

of the Core Committee on the Reorganization of the Secondary School for Manitoba states:

> The scholarly disciplines are properly regarded as constructs by which man attempts to organize and understand his experience; similarly mastery of factual knowledge is properly perceived as means to an end, that end being both an understanding of the concepts that give significance to the details and an ability to apply these concepts in new and problem situations.6

The grade seven and eight history and geography program authorized by the Department of Education has as an aim:

> To provide the pupil with a background of concepts and knowledge so that he may better understand society, both national and international, and through this understanding become a more useful citizen.7

The necessity of conceptual development is furthered by the grade nine course outline which quotes Charles Keller:

> We need to get at basic ideas, concepts, and generalizations, at the essence of things. Materials must be prepared which will enable students to arrive at ideas, concepts and generalizations.8

As well, the grade seven course syllabus lists as a skill objective:

> To develop the ability to interpret history by the use of audio-visual aids.9

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[6]Report of the Core Committee on the Reorganization of the Secondary School, The Secondary School, Department of Education, Province of Manitoba, p. 30-31.

[7]Department of Education, Grade Seven and Eight Social Studies History Geography, Province of Manitoba, 1970.

[8]Department of Education, Grade Nine History, Province of Manitoba, 1972.

[9]Department of Education, Grade Seven History, Province of Manitoba, 1970, p. 7.

The teacher is increasingly being involved in curriculum planning. The Report of the Core Committee on the Secondary School advocates the new role of the teacher, particularly in the area of studies designed for local needs and interests. Consequently the teacher must understand structure and its function in curriculum planning. The teacher must be capable of planning and designing media for the purpose of student concept development through the process of inquiry or critical thinking. Media must be designed for this purpose.

Still Visuals and other Media and Learning Effectiveness

Celeste Woodley's article 'Media and the New Social Studies' discussed the role and purpose of media in the teaching and learning process in the new curricular projects for the Social Studies in the United States.[10] The projects represented in Table I were selected on the basis that they included varied types of media. Some of the media studied were constructed specifically for the project and others were of a mass-produced commercial variety. Regarding the observations made concerning the application of the media to the classroom, two conclusions were made as follows:

> Students who are accustomed to T.V., modern cinema, and poster art find a steady diet of reading and discussion restrictive and boring. A variety of activities and diverse perceptual stimulation is essential to keep students' attention.

---

[10] Celeste Woodley, "Media and the New Social Studies," Social Education, Vol. 34, No. 4, April 1970, pp. 451-455.

TABLE I

SOCIAL SCIENCE CURRICULUM PROJECT

ELEMENTARY	FILMS	FILMSTRIPS	SLIDES	PICTURES	MAPS, CHARTS	"ORIGINAL" DOCUMENTS	ARTIFACTS	TRANSPAR-ENCIES	RECORDS, TAPES	GAMES, SIMULATIONS
Elementary School Economics Industrial Relations Center University of Chicago					+					+
Georgia Anthropology Curriculum Project University of Georgia	+								+	
Man: A Course of Study Educational Development Center	+	+	+	+	+				+	+
Our Working World Science Research Associates									+	
Social Science Laboratory Units Science Research Associates									+	
SECONDARY										
A New History of the U.S. Carnegie-Mellon University	+	+		+	+			+	+	
American Political Behavior Indiana University	+		+					+	+	
Anthropology Curriculum Study Project University of Chicago		+			+		+	+		
Comparative Economic Systems Carnegie-Mellon University		+						+	+	+
Comparative Political Systems Carnegie-Mellon University		+						+	+	
Econ. 12 San Jose State College	+				+			+		
From Subject to Citizen Educational Development Center						+				+
High School Geography Project Association of American Geographers			+		+			+	+	+
Humanities in Three Cities Carnegie-Mellon University		+			+			+	+	
Intro. to Behavioral Sciences Carnegie-Mellon University		+			+			+	+	
Man Through Time and Space Janesville, Wisconsin				+	+					
Shaping of Western Society Carnegie-Mellon University		+		+				+	+	
Sociological Resources for the Secondary Schools American Sociological Assn.			+	+	+			+	+	+
Tradition and Change in Western Society Carnegie-Mellon University		+						+	+	

[a] Ibid., p. 453.

> ...varied activities and varied media offer the student different ways to confront and organize subject matter so that it has meaning for him. The subject matter is a mix of facts, concepts, and generalizations stated as abstractions. Neither the teacher nor the printed page can transfer these inventions of the mind to the student unless he has first had some experience with the realities they represent.[11]

Woodley compared specifically produced media for a given project and commercially produced materials geared for a mass audience and observed that student learning was most effective when specifically produced media was utilized in instruction.[12] To determine the effectiveness of the media types listed--films, filmstrips, slides, pictures, maps, charts, 'original' documents, artifacts, transparencies, records, tapes, games and simulations--a graph was constructed by Woodley to compare the success of each. It is based upon a ten-point scale, where an achievement of ten points represents the highest degree of effectiveness. Simulation games were most effective, followed by artifacts and project slides. These slides were constructed directly in accordance with the projects' objectives. The teacher produced slides would be constructed on the same criteria but not having the resources, time, finances and professional assistance, the teachers could not expect to achieve the same degree of effectiveness. Commercially produced filmstrips not designed for any one specific project but for a mass audience, rated very low with an effectiveness of one point. This graph is reproduced in Figure 4.

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[11] Ibid., p. 462.

[12] Ibid., p. 452.

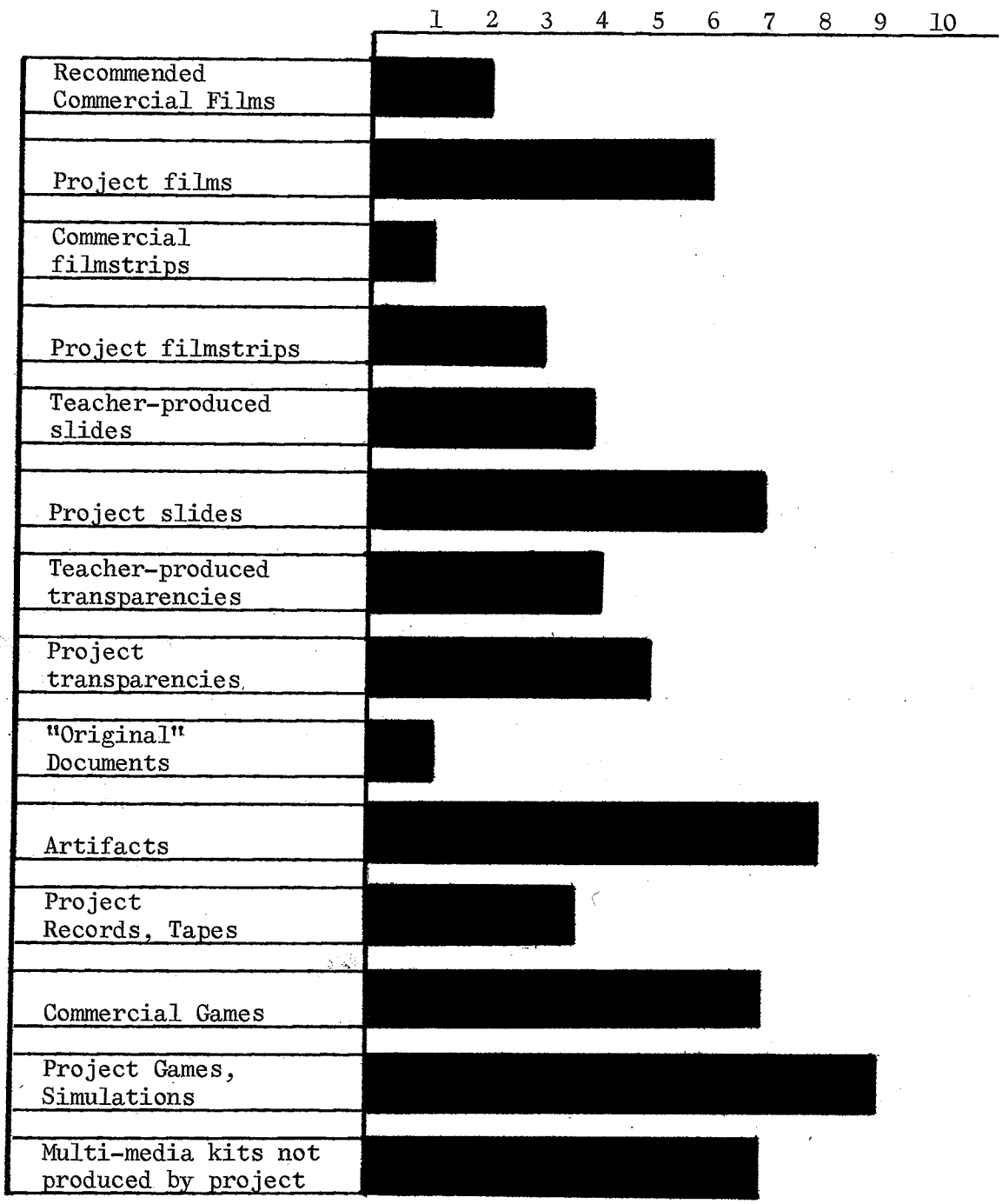

FIGURE 4

EFFECTIVENESS OF SOCIAL STUDIES PROJECT MEDIA

Ten points represents the highest degree of effectiveness. Judged on ability to generate and maintain interest, and to explicate and illustrate concepts and generalizations.

[a]Ibid., p. 454.

Woodley concluded her observations of the relationships between the media and the new social studies curricular projects with this implication:

> The more broadly a student is engaged with a variety of perceptions, the more probable it is that he will conceptualize. When media and materials are synchronized so that verbal and perceptual experiences support one another, the opportunity to form and organize concepts is increased. The educational value of the new social science curriculum materials derives in part from this potent combination of directed verbal and non-verbal expression.13

Woodley compared the media in Table I on the basis of generating and maintaining interest and illustrating concepts and generalizations.

Allen in Table II rated the effectiveness of different types of instructional media in a more detailed sense than Woodley, differentiating between factual information, visual identification, learning principles and concepts, learning procedures and learning motor skills. As well, Allen rated the affective nature of the media measuring the ability of the media to develop desirable attitudes, opinions and motivations. Unfortunately simulation games were not included in the listing but an interesting comparison is made between the media, and oral presentation and printed textbooks. The media in all instances except 3-D objects, rated equal to or higher than the traditional instructional strategy and resource with the exception of developing attitudes and opinions. The most effective medium used was the motion

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[13] Ibid., p. 455.

TABLE II

THE RELATIVE EFFECTIVENESS OF DIFFERENT TYPES OF INSTRUCTIONAL MEDIA FOR VARIOUS LEARNING OBJECTIVES. H REPRESENTS HIGH EFFECTIVENESS, M REPRESENTS MEDIUM EFFECTIVENESS AND L REPRESENTS LOW EFFECTIVENESS

	STILL PICTURES	MOTION PICTURES	TELEVISION	3-D OBJECTS	AUDIO RECORDINGS	PROGRAMMED INSTRUCTION	DEMONSTRATION	PRINTED TEXTS	ORAL PRESENTATIONS
Learning factual information	M	M	M	L	M	M	L	M	M
Learning visual identification	H	H	M	H	L	M	M	L	L
Learning principles, concepts, rules	M	H	H	L	L	M	L	M	M
Learning procedures	M	H	M	L	M	H	H	M	M
Performing skilled perceptual motor acts	L	M	L	L	L	L	M	L	L
Developing desirable attitudes, opinions and motivations	L	M	M	L	M	M	M	M	M

[a] W. H. Allen, op. cit., p. 25.

picture, followed closely by programmed instruction and television.[14] This result is corroborated in Schneider's[15] research and the work of Briggs, Campeau, Gagne and May.[16] Allen rates motion pictures and television as more effective in learning principles, concepts and rules which is in contrast to Woodley's findings. There are limitations in the use of moving pictures, with the main limitations being the great expense and sophisticated skills involved in the production of this media. Commercial films used in the classroom have the same drawback as commercially prepared slides, as they are geared to a mass audience with no specific objective in mind. Kemp terms the motion picture a 'transient' medium, requiring the student to learn at the same rate as the information is presented on the screen, while the still picture is a 'persistent' medium, allowing the student to proceed at his own pace and review the material when necessary.[17] Additionally, students will participate more during slide presentations than moving picture presentations since the presentation can be stopped or controlled.[18]

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[14]W. H. Allen, "Media Stimulus and Types of Learning," Audio-visual Instruction, Washington, D.C., National Education Association, 1967.

[15]Donald O. Schneider, "A Half Century of Social Studies Instructional Media: Unfulfilled Potential," Social Education, November, 1971, Vol. 34, No. 7.

[16]Leslie J. Briggs et al, Instructional Media: A Procedure for the Design of Multi-Media Instruction, A Critical Review of Research and Suggestions for Future Research (Pittsburgh: American Institute for Research, 1967).

[17]Jerrold Kemp, Instructional Design (Belmont: Lear Siegler, Inc., 1967), p. 65.

[18]Donald O. Schneider, op. cit., p. 837.

Motion picture generally is the form of medium used if the concept being developed is one involving action or movement, where the fluid motion must be perceived for conceptual development to occur. Although the persistent or static medium usually is thought to portray still pictures, it too can portray motion. It is this contention that is examined by O. W. Smith in his article, "The Portrayal of Events by Still Pictures." He states that a picture contains enough information to infer that change has occurred. The picture must provide sufficient cues to allow the observer to determine that the object was in motion when the picture was taken. The picture can indicate whether the action was a success or not. The conclusion that motion did occur is important, not the actual perceiving of the motion. Thus, filmstrips, drawings and slides can be substituted for moving pictures without any loss of learning effectiveness.[19] Confirmation of Smith's findings was in the experimental studies by O. W. Smith and L. Resnick,[20] who used static line drawings of humans to depict motion in achieving their conclusions. To conclude from the evidence determined by these studies, it is possible to assert that still pictures, the persistent medium, can in fact portray things, people, and events in a transient state of motion adequately and effectively.

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[19] John O. Cook, "Research in Audio-Visual Communication," in Frederick G. Knirk and John W. Childs, Instructional Technology A Book of Readings (New York: Holt, Rinehart and Winston, 1968), p. 277.

[20] Ibid., p. 277-278

Studies comparing the still medium to the motion medium in pictures for learning effectiveness have varied considerably in their results. These variations must be dependent upon the emphasis on purposes for learning and types of learning studied by the various research. On the question of this topic, Slattery (1953) found still visuals significantly superior to motion pictures for fifth grade Social Studies conceptual development. These results were regardless of student participation.[21] Hoban and Van Ormer (1950) contradict Slattery and suggest that where still visuals were found superior to motion pictures, it was due to the slower rate of instruction used in the presentation of the visuals. Conversely, the superiority of motion pictures in some research possibly could result from the greater adaptability of moving pictures for portraying interacting events.[22] VanderMeer (1950) attempted to compare the learning effectiveness of written information to visual information as applied to eighth and eleventh grade American history classes. The general results were inconsistent, but in specific comparisons, he did conclude that where the filmstrip group was superior to the reading group, it was when the filmstrip was used to define or illustrate a concept.[23]

Realism theorists (Finn, 1953; Dale, 1946; Gibson, 1954; Osgood, 1953; Knowlton, 1964), although focusing their research on simple stimulus-response learning, state that the more realistic and authentic

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[21] Leslie J. Briggs et al, op. cit., p. 129.

[22] Ibid., p. 129.

[23] Ibid., p. 131.

the stimulus situation, the greater the probability it has to increase learning effectiveness.[24] This conclusion can be plotted on a visual realism continuum (refer Figure 5). Verbal or written words are very low in their degree of realism because they can not represent the referent in a physical sense.

The photographs must be realistic and well defined but not cluttered and so full of detail that the essential features of the referent can not be perceived. Attneave (1954), Broadbent (1958, 1965), Jacobson (1950, 1951), Livingston (1958, 1959, 1962) conclude that an excessive number of stimuli or cues will result in either a filtering of information or an interference in learning.[25]

According to the realism continuum (Figure 5) a color realistic photograph should be more efficient in facilitating learning than a black and white realistic photograph. It is expected or assumed that color provides an essential cue in learning but research in this area does not support or negate this assumption. Long (1946), in comparing the effects of color and black and white films on learning in students in grades five, six, eleven and twelve, found that on retention tests after four and one-half months, the color films were superior in all grades except grade eleven.[26] This indicates that other variables

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[24]Francis M. Dwyer, A Guide for Improving Visualized Instruction (State College, P.A.: Learning Services, 1972), p. 5.

[25]Ibid., p. 20-24

[26]John O. Cook, "Research in Audio-Visual Communication," in Frederick G. Knirk and John W. Childs, Instructional Technology A Book of Readings (New York: Holt, Rinehart and Winston, 1968), p. 266.

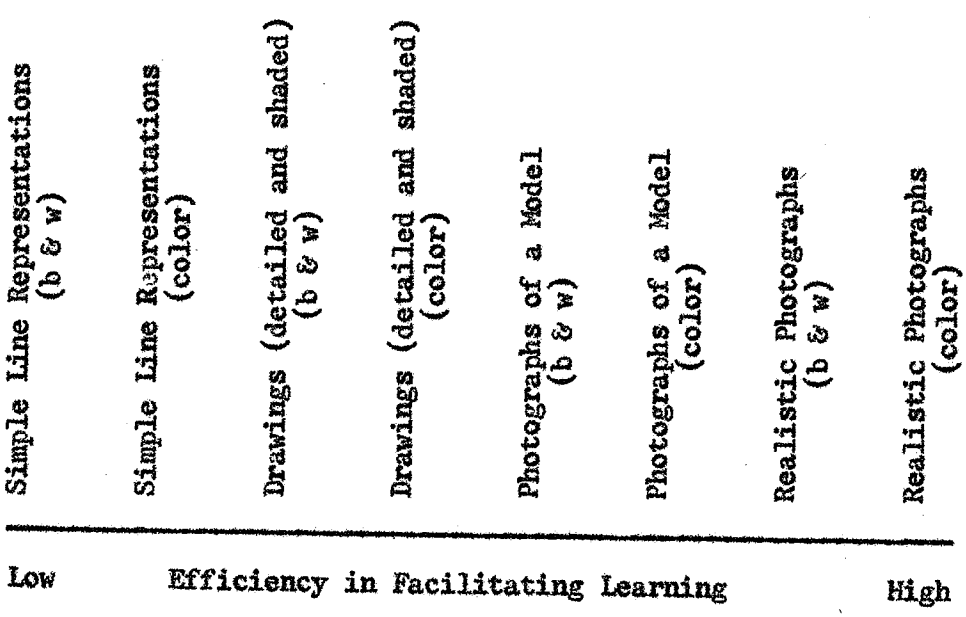

FIGURE 5

POINTS ON THE REALISM CONTINUUM
IN ACCORDANCE WITH THE REALISM THEORIES

[a] Ibid., p. 5

possibly were acting to confuse the results, making them extremely unreliable.

The confusion on this issue is expressed by the following studies. Lumsdaine, 1963; Otto and Askov, 1968; Zuckerman, 1954; May and Lumsdaine, 1958;[27] Briggs et al, 1967,[28] conclude that there is no substantive evidence to indicate any overall increase in learning resulting from the use of color in films. This conclusion is negated by the studies of Weiss and Margolius, 1954; Green and Anderson, 1956; Peterson and Peterson, 1957; Bowine and Restle, 1959; and Saltz, 1963.[29]

While color may not increase learning effectiveness, it is postulated that color can act as a motivator to learning by making the material more attractive to the learner. The Burke Marketing Research Study (1960) and Gallup and Robinson (1965) make this assertion after investigating the effectiveness of television commercials in both color and black and white. Color commercials received higher viewer rating and were viewed to completion by more viewers.[30]

A vital factor ignored in the previously cited studies was the fact that the visual media do not exist alone and are not used solely to compete with other teaching strategies. They must be part of a complete instructional procedure existing within a total unit of studies.

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[27] F. M. Dwyer, op. cit., p. 7-9.

[28] Leslie J. Briggs et al, op. cit., p. 120-139.

[29] F. M. Dwyer, op. cit., p. 7-9.

[30] Ibid., p. 8-9.

Their application for the conceptual development of the learner through inductive approaches to learning has only superficially been examined and evaluated. The existing variables in each situation are different and must be taken into consideration to varying degrees in each and every evaluating experimental situation. As a consequence the reliability and validity of the preceding research can be concluded to be tentative at best.

Considerations other than Learning for Media Selection

Learning effectiveness is of utmost importance when selecting the Instructional media for the classroom. Practicality deems that considerations other than learning must be factors for the selection and utilization of Instructional media types. Three further criteria influencing choice are production considerations, availability and equipment cost. Kemp has prepared a list of questions which could be applied to the media to determine whether its application to a particular classroom setting is feasible:

1. Does the needed material already exist in suitable form and quality?
2. What are the anticipated purchase or preparation costs?
3. What are the reproduction or duplication costs, if any?
4. How much time will be required to locate or prepare each item?
5. What are the requirements for equipment, facilities, technical skills or services in preparation?
6. Is one medium more suitable than the others with respect to ease of viewing or student handling?

7. Will there be problems regarding equipment, facilities, supervision, and scheduling?
8. Will there be problems in the maintenance and storage of the materials for future use?
9. Is there a student preference of one kind of materials to others?
10. What is the teacher's preference?
11. Can a rating be made (from pilot try-outs using various possible materials, if feasible) to determine whether there is greater student achievement from the use of one type of material rather than others?[31]

Allen's table, 'Considerations Related to Various Instructional Media'[32] applies, in a summary form, most of Kemp's questions to a list of eleven media types.

To rate the eleven criteria questions established, Kemp devised a rating chart to guide selection. Using Table III as a guide for establishing value, a rating-scale, based on either a three-or-five point system, would determine which media would satisfy a given set of needs, for a particular classroom setting. Refer to Table IV.[33]

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[31] J. Kemp, op. cit., p. 68.

[32] W. H. Allen, op. cit., p. 31.

[33] J. Kemp, op. cit., p. 68.

TABLE III

CONSIDERATIONS RELATED TO VARIOUS INSTRUCTIONAL MEDIA

INSTRUMENT	MEDIA USED	PRODUCTION CONSIDERATIONS	AVAILABILITY	EQUIPMENT COST
1. Filmstrip or slide projector	35mm filmstrips or 2x2 slides	Inexpensive; may be done locally in short time	Usually available; requires darkened room	Low
2. Overhead transparency projector	Still pictures and graphic representations	Very inexpensive; may be done locally in short time	Available; may be projected in light room	Low
3. Wall charts or posters	Still pictures	Very inexpensive; may be done locally in very short time	Available; no special equipment needed	Very low
4. Motion pictures (projection to groups)	16mm motion picture (sound or silent)	Specially produced; sound film is costly and requires 6-12 months	Usually available, required darkened classroom	Moderate
5. Motion picture projection as repetitive loops (8mm silent) to individuals	8mm motion picture film (silent)	Special production normally necessary; may be produced as 16mm film alone or locally at low cost and in short time	Not normally available; will need to be specially procured to meet requirement of instructional program	Low per unit, but moderate for groups
6. Magnetic tape recorder	1/4" magnetic tape	Easy and inexpensive; usually produced locally	Available	Low
7. Record player	33 1/3, 45, or 78 rpm disk recordings	Need special recording facilities, usually commercially made	Usually available	Low
8. Display area	3-D models	May vary in complexity and in difficulty of production; component parts easy to obtain	Available	Varies from low to high

TABLE III (continued)

INSTRUMENT	MEDIA USED	PRODUCTION CONSIDERATIONS	AVAILABILITY	EQUIPMENT COST
9. Television (closed-circuit)	Live presentations, motion picture film, video tape recordings, still pictures	Normally requires large and skilled production staff	Not normally available	Moderate to high
10. Teaching machines and programed textbooks	Programed material	Some programs available commercially; but will normally be specially prepared for course	Not normally available	Low per unit, but moderate for groups
11. System combinations	Television, motion pictures, still pictures, audio recordings	Complex; probably will be done locally to meet specific requirements	Not normally available	Moderate to high

[a] Ibid., p. 31.

TABLE IV

RATING CHART FOR MEDIA SELECTION

CRITERIA	ALTERNATE MATERIALS		
Commercially available			
Preparation costs			
Reproduction costs			
Time to prepare			
Skills-services			
Viewing-handling			
Utilization problems			
Maintenance-storage			
Student preference			
Instructor preference			
Achievement level			

[a] J. Kemp, op. cit., p. 68

Toward a Definition of Concept

Many educators and psychologists have attempted to define what exactly is implied by the term 'concept.' Concepts are not facts. A fact is an instance of a concept. Facts are significant only when they are in relation to one another to make a concept or a generalization. A generalization is the relationship between two or more concepts or the instances of a concept. Bruner regards concepts as man-made systems of classifying or categorizing. Concepts are not things but are psychologically constructed categories based upon experience. Consequently concepts are not concrete, but are abstractions. Thus perceptual stimuli from the environment will be placed into a previously existing category or concept. The concept will expand, become more refined and more sophisticated due to continued experiences and stimuli.[34] Woodruff defines concept as:

> ...some amount of meaning more or less organized in an individual mind as a result of sensory perception of external objects or events and the cognitive interpretation of the perceived data.35

Bruner assumes virtually all cognitive activity involves and is dependent on the process of categorizing and all interaction with the environment consists of dealing with classes of events. Through learning, a system of categories or concepts is built up, which groups classified perceived

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[34] E. Stones, An Introduction to Educational Psychology (Barnes and Noble Inc., 1966).

[35] A. D. Woodruff, "The Use of Concepts in Teaching and Learning," in D. G. Ryans (ed.), With the Researchers (Chandler Publications in Educational Psychology, San Francisco Calif.: Science Research Associates, Inc.).

events as equivalent.[36]

Ausubel and Robinson speak of criterial attributes of a concept in reference to:

> ...the set of properties that each member of the concept class has in common and moreover, that distinguish members of other classes.
>
> ...once the criterial attributes of a concept are known, the individual would be able to judge whether any particular instance which he encounters is an exemplar or nonexemplar of the concept in question.37

The relationship between concepts and classification is expressed by Piaget who, considers that the child's ability to think logically is founded on his ability to classify things and events. Logical thinking implies that the child has established certain criteria for his classification system.[38] This relationship between concepts and thought is established by Harre. Concepts are regarded as:

> ...vehicles of thought. When we talk about 'employing concepts,' 'acquiring concepts,' 'analyzing concepts,' we are talking of using, learning, and anatomizing the entities by means of which thinking is carried on.39

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[36]Marilynne J. Adler, "Some Educational Implications of the Theories of Jean Piaget and J. S. Bruner," Canadian Education and Research Digest, March, 1965.

[37]D. P. Ausubel and F. G. Robinson, School Learning An Introduction to Educational Psychology (New York: Holt, Rinehart and Winston, Inc., 1969), p. 61.

[38]E. Stones, op. cit., p. 85.

[39]Rom Harre, "The Formal Analysis of Concepts," in H. J. Klausmeier and C. W. Harris, Analysis of Conceptual Learning (New York: Academic Press, 1966), p. 3.

Thinking then is the process of organizing and storing concepts.[40] The formation of the concepts is achieved through learning. This learning is meaningful when the concepts potentially can be related or transferred to new situations.[41] Ausubel states that the most important element in meaningful learning is the existing cognitive structure of the learner's present knowledge. The learner must have available the appropriate relevant concepts, which are clear, organized and stable.[42] For new concepts or new instances of a concept to be meaningful, three criteria must be satisfied:

1. The material itself must be relatable to some hypothetical cognitive structure in a nonarbitrary and substantive* fashion.
2. The learner must possess relevant ideas to which to relate the material.
3. The learner must possess the intent to relate these ideas to cognitive structure in a nonarbitrary and substantive fashion.[43]

Meaningful learning has two basic dimensions--meaningful reception learning where the principal content of what is to be learned is presented to the learner in final form, and meaningful discovery learning, where the principal content of what is to be learned is not

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*substantiveness refers to the situation in which the relationship is not altered if presented in different ways or forms. For example, if different wording is used the original relationship exists.

40 A. D. Woodruff, op. cit., p. 85

41 E. Stones, op. cit., p. 194.

42 D. P. Ausubel, Learning Theory and Classroom Practice (The Ontario Institute for Studies in Education, Bulletin No. 1, 1967).

43 D. P. Ausubel and F. F. Robinson, op. cit., p. 53.

given but must be discovered by the learner before he can internalize it. It cannot be assumed that reception learning is a passive process. According to Ausubel:

> It is still necessary for the learner to relate the new material to relevant established ideas in his own cognitive structure; to apprehend in what ways it is similar to and different from related concepts and propositions: to translate it into the frame of reference of his own experience and vocabulary; and often to formulate what is for him a completely new idea, requiring much reorganization of his existing knowledge.44

If these conditions are not satisfied, rote learning rather than meaningful learning will occur. A hierarchy exists within the conceptual structure and the meaningful new learning is fitted into this hierarchy. The hierarchy exists from concepts of the specific to concepts which are general in nature, whereby specific concepts are subsumed under concepts of a greater generality. This is the essence of Ausubel's Subsumption Theory:

> ...as new material enters the cognitive field, it interacts with and is appropriately subsumed under a relevant and more inclusive conceptual system. The very fact that it is subsumable, that is, relatable to stable elements in cognitive structure, accounts for its meaningfulness and makes possible the perception of insightful relationships. If it were not subsumable, it would constitute rote material...45

As rote material does not fit into the hierarchy, lacks meaning, and is not transferable to new situations, it tends to be forgotten easily.

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44 D. P. Ausubel, "Meaningful Reception Learning and the Acquisition of Concepts," in H. J. Klausmeier and C. W. Harries, op. cit., p. 250.

45 D. P. Ausubel, "A Subsumption Theory of Meaningful Verbal Learning and Retention," in Raymond G. Kuhlen (ed.), Studies in Educational Psychology (Waltham, Mass.: Blaisdell Publishing Company, 1968), p. 170.

This hierarchy implies that conceptual learning shows a sequential development, beginning initially with concrete experiences and moving towards abstractions or concepts. Piaget expressed this development in his analysis of biological changes and learning development in children from childhood to adolescence. Taba, Levine, and Elzey suggest this sequential development is actually a spiral development. This is based on the assumption that there is a sequential ordering in thought development. This necessitates a sequencing of the learning experiences. Each step must be developed on the preceding learning skills and each step is a prerequisite to the next step. As the learner proceeds through this process of organizing information, the groundwork is provided for the evolving and organizing of concepts. This is the development from the concrete to the formal and abstract areas of thought where the learner reaches the stage of discovering relationships between objects and events.[46]

Perception and Conceptual Development

Woodruff states that "...perception provides bits of meaning of which concepts are made."[47] Concept formation begins with the direct perceiving of the thing, or referent. The relationship between perception and cognition is hypothesized by Ausubel:

> ...information and ideas have to be perceived before they can be incorporated into cognitive structure and give rise to meanings.

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[46] W. C. Meierhenry, "Relationships of Media and the Curriculum," in Robert A. Weisgerber, (ed.), Instructional Process and Media Innovation (Chicago: Rand McNally & Company, 1968), p. 16.

[47] A. D. Woodruff, op. cit., p. 86

> Meaning, in other words, results from subsumption of perceived potential meanings under established concepts and propositions. Perception therefore precedes cognition in meaningful verbal learning. This implies that the product of the perceptual process is not meaning itself, but rather the immediate content of awareness that follows from the preliminary interpretation of the sensory input (visual or aural) furnished by the potentially meaningful learning task. This perceptual content of awareness is intermediate, in terms of both time and process, between primitive sensation and the actual emergence of meanings.[48]

Ausubel separates the fine distinction between the act of perceiving and of meaning. Woodruff says that through a process of ideation, the meaning is incorporated into the conceptual structure. Meaning derived is dependent upon the existing cognitive structure and this meaning can be distorted. Ausubel explains this:

> ...each individual possesses an idiosyncratic array of established and relevant concepts in his cognitive structure under which the new material may be subsumed; the resulting meanings in each learning situation are a function of the particular subsumptions that occur.[49]

According to Woodruff, meaning is derived from a process of differentiation, which is simply the separation of various elements in the environment. (refer Figure 6) Once the separation has been achieved it is possible to perceive three different kinds of meaning. First, one perceives the structural characteristics of the referent. Second, one perceives the function of the referent and the consequences of the function. Third, one perceives the qualities of the referent, such as shape, color, moral state, efficiency or effectiveness.[50] From the first

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[48] D. P. Ausubel, "A Cognitive Structure Theory," in H. J. Klausmeier and C. W. Harries, (eds.), op. cit., p. 220.

[49] Ibid., p. 221.

[50] A. D. Woodruff, op. cit., p. 88-89.

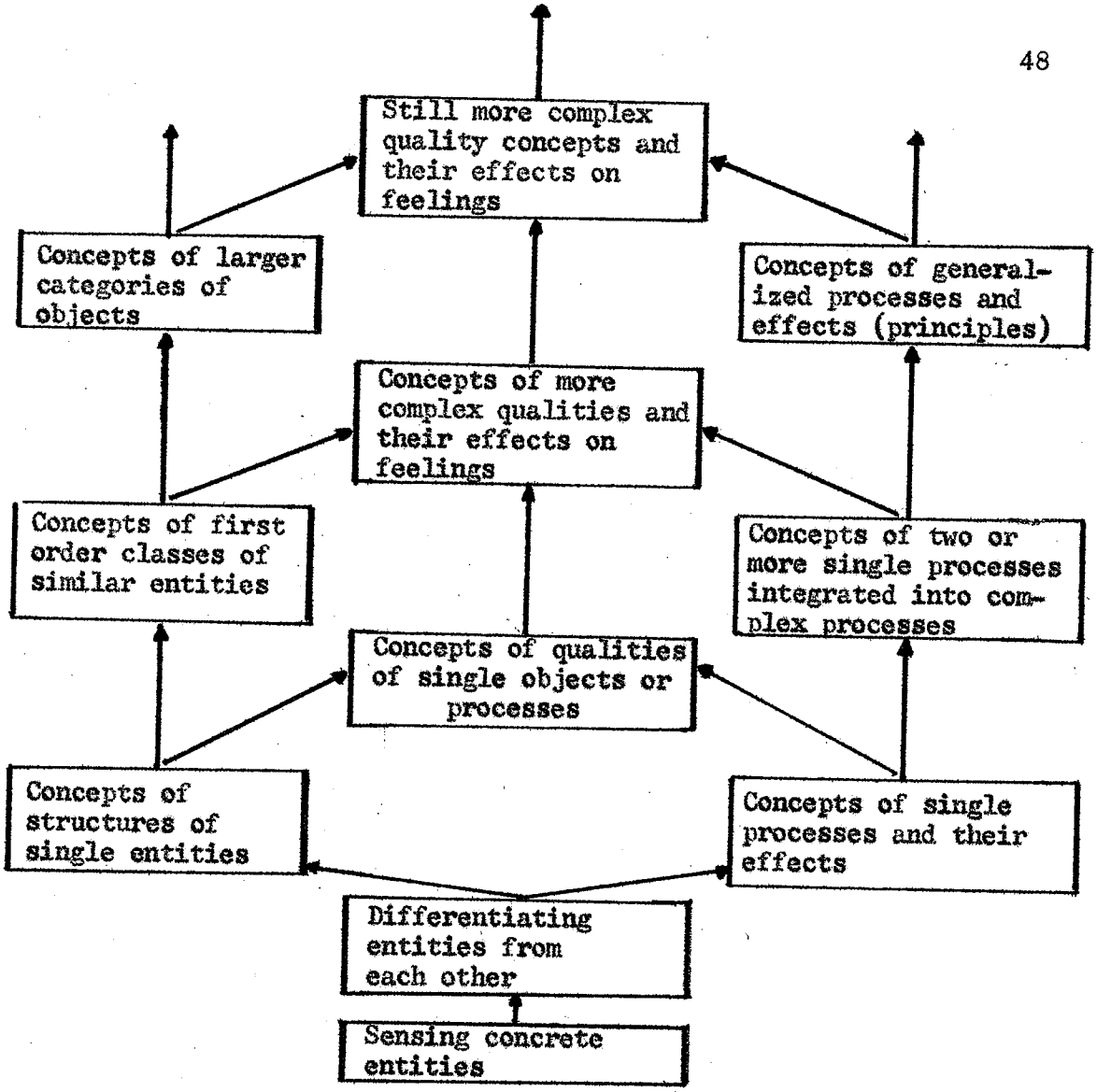

FIGURE 6

THREE KINDS OF PERCEPTUAL RECOGNITION AND CONCEPTUAL ORGANIZATION IN A GRADUATION FROM SIMPLE SENSING TO CONCEPTUAL MATURITY

[a]Ibid., p. 88.

kind of meaning would emerge structural concepts, from the second would emerge process concepts, and from the third, concepts of qualities where the quality has been abstracted from the concrete object or process in which it was perceived and is now conceived by itself.[51] This is strongly related to Arnheim's thought activities of direct perception, which give rise to meaning. Where Arnheim makes no attempt to explain the relationships of the thought activities, Woodruff illustrates the three kinds of meaning and their relationships in the hierarchy of conceptual development.

The concrete referent is perceived and the learner separates the elements of the referent. The three types of concepts are developed from the differentiated elements of the referent. The process commences from a simple perception and proceeds to a complex ordering of concepts. This process is simplified in Figure 7 which portrays the role of perception in complex conceptual development. Perception provides the learner with a 'mental image' which is a construct made by the individual by organizing precepts in such a way so as to help the individual relate himself effectively to his world. Each level is dependent upon previous levels, with conceptual development at a higher level impossible without preceding conceptual development at lower levels.[52]

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[51] Ibid., p. 89.

[52] Ibid., p. 90.

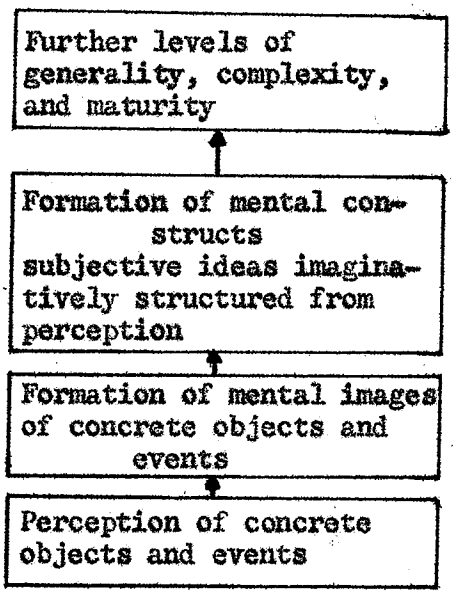

FIGURE 7

LEVELS OF CONCEPTUAL DISTANCE FROM THE SENSORY WORLD

[a] Ibid., p. 90.

R. Arnheim concludes that "...all genuine thinking takes place in the medium of perceptual imagery."[53] He differentiates between a conditioned reflex response and conceptualization, where he regards the more complex processes involved in concept formation as 'genuine' thinking. The process of classification is dependent upon and inter-related with perception. "Direct perception ...needs to be considered as the primary realm of conceptual thinking."[54] Arnheim includes such things as distance, selectivity, change, shape, brightness, color, or relations between elements as thought activities of direct perception. He fails to elaborate on the existence of transfer of learning which is crucial for conceptual development. He acknowledges that in perception certain relationships or patterns can be perceived and have meaning for the learner. Perception gives rise to the formation of images which are abstract representations of the concrete. An image serves three functions: as a sign in which it represents certain content; as a picture which portrays objects or activities; or as a symbol to the extent to which it portrays things located at a higher level of abstraction.

Arnheim uses the phrase perceptual experience in the same way Ralph Tyler uses the words learning experience. He stresses the role

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[53]Rudolf Arnheim, "Study of Visual Factors in Concept Formation," U.S. Department of Health, Education, and Welfare, May 1968. ERIC, February 1969, vol. 4, No. 2, (ED 022221).

[54]Ibid., p. 8.

and need of visuals in learning and provides two criteria that a visual's image must provide to achieve a perceptual experience. The image must be at a level of abstraction that the child is capable of comprehending. For example, the visual must not be too visually complex for the learner. The image also must use the perceptual qualities (shape, color, brightness and movement) in a way that allows for the perception of the important and relevant features.[55]

Two studies to measure learning when stimuli are presented through visual and auditory channels and combinations thereof, concluded that for many given situations, visual stimuli tend to take precedence over auditory stimuli for learning effectiveness. Lordahl's[56] conclusions were based on two channels while Severin used six* various channels. Severin's final conclusion showed that an auditory signal combined with

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* The six channels used were:
1. One-channel visual.
2. One-channel auditory.
3. Two-channel redundant (words presented audibly with simultaneous presentation of the same words visually).
4. Two-channel high simularity (words presented audibly with simultaneous presentation of pictures of different objects of the same class).
5. Two-channel low simularity (words presented audibly with simultaneous pictures of objects of a different class).
6. Two-channel cue summation-words presented audibly with simultaneous pictures of objects of a relevant class).

[55] Ibid., p. 14.

[56] D. S. Lordahl, "Concept Identification Using Simultaneous Auditory and Visual Symbols," Journal of Experimental Psychology, 63: 283-90, 1961.

a relevant picture, a two channel cue summation condition was superior for conceptualization.[57] Refer to Figure 8 for Severin's final results.

The two previously cited studies concern themselves with perception. They are concerned with classifying or categorizing certain stimuli from the environment to create a concept. They do not deal with the incorporation of new meaning into an existing cognitive structure. This is the realm of abstraction where concrete experiences are given meaning through the process of verbalizing. Smith sees the role of words as:

> ...symbolic shorthand invented to classify the myriad of experiences and to provide sensible translations of sensory perception for the individual himself and to permit communication with others.[58]

According to L. S. Vigotsky language can impede conceptual development if verbalizing precedes visualizing:

> Simply telling the child ...will accomplish nothing but empty verbalism, a parrot-like repetition of words by the child, simulating a knowledge of the corresponding concepts but actually covering up a conceptual vacuum.[59]

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[57] W. Severin, "Cue Summation in Multiple-Channel Communication. Report from Media and Concept Learning Project Technical Report," Wisconsin Research and Development Center for Cognitive Learning, The University of Wisconsin, January, 1968.

[58] Herbert A. Smith, The Teaching of a Concept An Elusive Object, Washington D.C.: National Science Teachers Association Publication # 471-14342, 1966, p. 3.

[59] E. Stones, op. cit., p. 163.

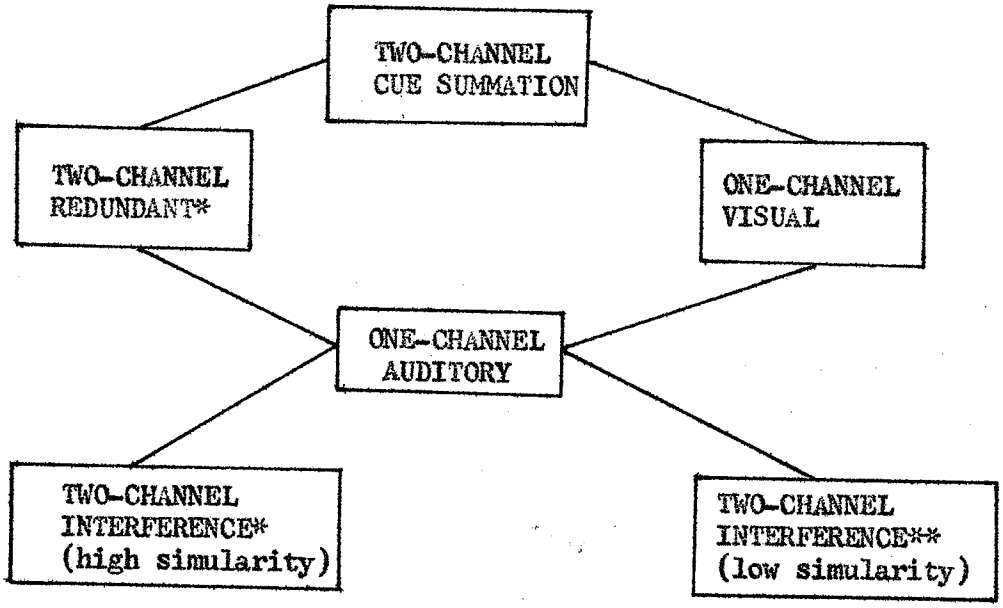

FIGURE 8

CUE SUMMATION RESEARCH:
PREDICTED RANK ORDER COMPARISONS
HIGHER POSITIONS MAY BE READ AS "GREATER THAN"

*Redundant--same cue presented in different channels

**These methods of communication hindered conceptual development as an interference to learning situation was created

[a] Ibid., p. 3.

> To foster real conceptual learning the teacher must give the child controlled experience involving the use of new concepts in familiar contexts so that he gradually builds up accurate notions of concepts.[60]

Woodruff uses the expression 'verbal stimulation' in context with the relationship between verbalism and conceptual development. (refer Figure 9) This is the role he delegates words to play in the learner's development of a concept therefore determining the function of the teacher in this process. Care must be taken that the verbal process does not create or cause interference to hinder or impede conceptualization. Refer Figure 9 for Woodruff's possible roles of verbal stimulation on the cognitive structure. Once a concept has been given a basis in reality or in visual expression of reality it will become possible to build upon the concept.

Piaget states that concept formation was directly dependent upon the stage of biological development of the child, whereas Vigotsky's research concluded that conceptualization reflected the past experiences of the learner.[61] This is in agreement with Ausubel's subsumption theory of cognitive development. If new meaning is introduced and the individual does not possess the necessary concepts under which the new material can be subsumed, the new meaning is forgotten. The necessary concepts are only developed through past learning experiences. Vigotsky, supported by the investigations of A.R. Luria, further concluded that if language development of the learner has been retarded due to experiental background, conceptual development will also be hindered.[62]

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[60] Ibid., p. 180.

[61] Ibid., p. 172.

[62] Ibid., p. 172.

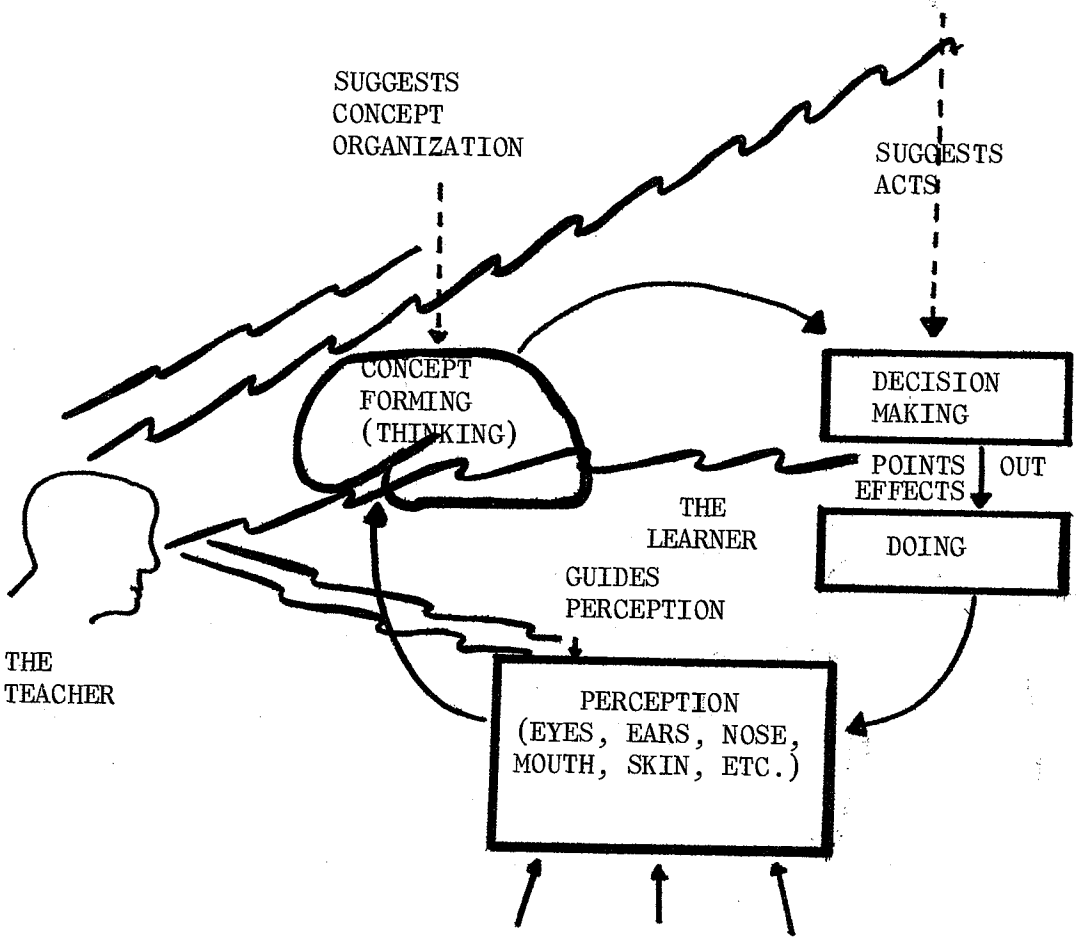

FIGURE 9

POSSIBLE ROLES OF VERBAL STIMULATION
IMPOSED ON THE COGNITIVE STRUCTURE

[a] A. Woodruff, op. cit., p. 87.

Vigotsky developed the argument further. Through his research he recognized that concept formation was a developmental process and a learner must pass through a series of stages or steps before forming a classification. This series of steps was in support of Piaget's research. Vigotsky totally isolated language and concept formation through the use of nonsense words to apply to specific elements in the environment. The first step in concept formation was the perceiving of the elements. The actual classification of concrete aspects of the elements did not depend on language, but abstraction of the common aspects of the elements required language.

Thus a secondary part in concept development is the function of language. A. S. Woodruff and L. S. Vigotsky in their research on this topic can be concluded by the following statements:

> The verbal process is primarily ...a means of expressing ideas to others, and this expression seems to be essentially a means of guiding attention to what is already present in the listener's mind, not communicating meaning which is not already there.63

> Memorization instead of concept formation will occur when the symbolic material attempts to convey meaning for which the listener has not perceptual basis for making an interpretation.64

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63 A. Woodruff, op. cit., p. 87.

64 Ibid., p. 87.

Learning Objectives

Bloom, Hastings and Madaus state that education is a process by which the learner changes. These changes may be intentional or unintentional. The changes desired by the teacher are the educational objectives or the goals of instruction.[65] Consequently the primary objective of teaching is to instigate learning, with the result being the desired changes of behavior in students.[66] The teacher must diagnose the needs of the individual students and prescribe learning experiences in order to elicit the determined and desired behavioral changes in the student.[67] Although it is impossible to anticipate all outcomes of instruction, specific outcomes must be planned for and evaluated:

> A statement of an objective is an attempt by the teacher or curriculum maker to clarify within his own mind or communicate to others the sought for changes in the learner. To accomplish this, the educator must choose words that convey the same meaning to all intended readers. Statements of objectives that can be interpreted differently by different readers give them no direction in selecting materials, organizing content, and describing outcomes, nor do they provide a common basis for instruction or evaluation.[68]

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[65] B. S. Bloom, J. T. Hastings and G. F. Madaus, Handbook on Formative and Summative Evaluation of Student Learning (New York: McGraw-Hill Book Company, 1971), p. 19.

[66] C. R. Carpenter, "Adapting New Educational Media for Effective Learning of Students," in Frederick G. Knirk and John W. Childs, Instructional Technology A Book of Readings (New York: Holt, Rinehart and Winston, 1968), p. 236.

[67] Laurence J. Peter, Prescriptive Teaching (New York: McGraw-Hill Book Company, 1965).

[68] B. S. Bloom et al, op. cit., p. 20.

Haller discusses two levels of instructional objectives. Tyler uses the word 'objectives' to encompass both 'goal' objectives and 'performance' objectives. The goals are the products of the teaching-learning process and are of a general nature. To satisfy the goal the student must demonstrate specific behaviors or learning processes stated in specific performance objectives. The specific performance objective describes the observable behavior, specifies the conditions under which the behavior is to occur, the content and level of acceptable performance.[69] The goal is the learning product; the performance objectives are the learning processes.

Bloom and others have constructed a classification system or taxonomy which places cognitive behaviors within a hierarchial framework called the cognitive domain.* Each category or level upwards is assumed to include a learning process more complex or abstract than the previous category. The categories are arranged in a continuum beginning with simple processes and moving to the more complex. The cognitive behaviors defined by Bloom are: Knowledge, comprehension, application, analysis, synthesis, evaluation. Through inquiry, the student utilizes the learning processes to develop and apply concepts. The goal of the

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*Human behavior traditionally has been divided into three domains. The cognitive domain concerns intellectual abilities and skills; the affective domain deals with interests, attitudes and values; the psychomotor domain deals with motor skills.

69 H. Haller, Writing and Using Performance Objectives (San Jose, California, The Lansford Publishing Co.), p. 13.

slide series is the development and application of concepts to formulate generalizations.

A behavioral objective implies learning experiences. The behavior exhibited is detailed, the content with which the behavior is to be expressed is defined; and the interaction between the learner and the content is the learning experience. Learning occurs through the experiences of the learner and through his interactions with the environment.[70] The role of the teacher is to structure the environment in which the learning experience will occur.*

The sought for changes in the learner must be observable in his behavior in order to be evaluated. The behavioral objectives must be expressed specifically in reference to the content to which the learning process is applied. A clearly expressed objective or goal of instruction has two aspects--the behavior exhibited and the content about which the

---

*The structure is the method or mode of instruction used by the teacher. Gagne has defined six major modes of instruction:

1. The tutoring session.
2. The lecture.
3. The recitation class.
4. The discussion class.
5. The laboratory.
6. Homework.[71]

[70] R. Tyler, op. cit., p. 64.

[71] CRM Books, Educational Psychology A Contemporary View, (Del Mar, Calif.: Communications Research Machines, Inc., 1973), p. 222.

behavior is expressed. Tyler concludes that statements of objectives or goals are the first step in the development of curriculum materials. The material resources must be designed to provide a learning experience. The objectives also provide for the evaluation of the constructed visual resources.[72] Every visual in a series must be selected for the purpose of achieving a particular learning objective. Lichtenberg and Fenton take this contention further. Each piece of audiovisual material must develop the objective through a consciously selected teaching strategy--this strategy being the inductive approach to learning--learning through the use of inquiry or critical thinking skills.[73]

The major area of research completed in relating kinds of learning and media selection has been in the area of rote learning rather than conceptual learning and problem solving. Future study is imperative in this area. Briggs and his associates suggest that further investigations should be geared to satisfy the following deficient areas of knowledge:

> Preparation of a 'Media Taxonomy' which would list both commonly known and unusual, or potential, features, ...and instructional functions which can be provided by various media.

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[72] Benjamin S. Bloom et al, op. cit., p. 25.

[73] Mitchell P. Lichtenberg and Edwin Fenton, "Using AV Materials Inductively in the Social Studies," in William E. Gardner and Fred A. Johnson, (eds.), Social Studies: A Book of Readings (Boston: Allyn and Bacon, Inc., 1970), p. 259.

Expansion of the situation analysis to account for individual-differences and situational variables.

Applied research to evaluate particular media options for specific objectives to validate judgments and to aid in the search for new generalizable insights.

Analysis of the role of manipulation of real objects verses pictorial representation in concept formation by young children, in the continuing search for improving the effectiveness of visual media.

Increased basic research in the 'higher' forms of learning: concept formation; principle learning; problem solving.[74]

Summary and Conclusion

The research reviewed compares the effectiveness of media types, particularly still visuals and motion pictures, thereby providing basic criteria for deciding between various materials for particular needs. What the research does not provide is a method of developing media for learning objectives. The educational objectives specify a type of learning, the use of specific learning processes. These processes provide the conditions for learning which determine media selection. The conditions for learning are expressed in the behavioral objectives. It is this lack of research that determined the necessity of the study. Therefore a procedural model is necessary for the construction of visual resources that will provide a learning experience in which the student will exhibit the desired behavior as determined by the learning objectives.

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[74] Ibid., p. 148-150.

The learning processes utilized are for the purpose of the conceptual development of the student. Conceptual development begins with the exposure to concrete experiences. The slide visuals provide these concrete perceptual experiences which the student must use through the application of specific learning processes to achieve the goal, that of the development of select concepts. Thus the sequencing of the learning experience is from the concrete perceiving to a conclusion of the verbalizing of the concept.

PART II

Introduction

This section is concerned with the technical considerations and research as applied to the copying techniques developed for the study. The single-lens-reflex camera and system and the slide film types utilized in the slide series are the topics under discussion.

The Camera and the System

The camera used in the procedure is a single-lens reflex camera with a built-in exposure or light meter. Because of the reflecting mirror of the single-lens reflex, through-the-lens viewing is possible. Thus the user sees in the viewfinder what the lens is actually focused on. In a range finder camera where the viewfinder is located beside or above the lens and does not have through-the-lens viewing, the viewfinder image and lens image are different, because the camera lens and the viewfinder do not have the same field of view. This phenomenon, called parallax is evident in copy photography since the distortion between lens and viewfind images increases the closer the lens gets to the subject. (refer Figure 10)

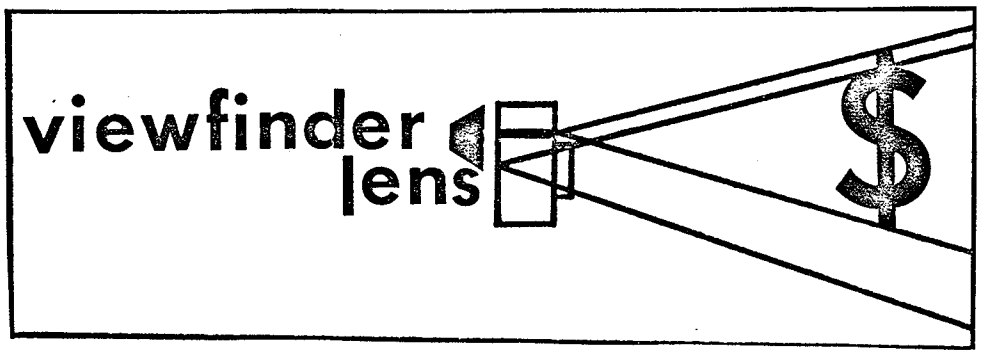


FIGURE 10

PARALLAX

The single-lens reflex camera comes equipped with a standard lens which is of good quality to produce very satisfactory reproductions of most originals. Generally this lens has a focal length ranging from 46 mm to 55 mm and can focus down to a minimum distance of two to three feet. The smallest original that could be reproduced accurately on film using the standard lens is approximately the size of a note-book page. For photographing smaller originals, a supplementary lens must be attached to the camera lens. These supplementary lenses, or close-up lenses, magnify the original to a size allowing the original to be photographed. When these lenses are attached to the standard lens, no compensation of exposure is required. The camera is operated in the usual manner. These close-up lenses are generally sold in sets of three. The lenses magnify the original and the film records the magnified image. The lenses are numbered 1+, 2+ and 3+ with the 2+ lens having a greater magnifying power than the 1+ and the 3+ greater than the 2+ lens. The numbers refer to the diopter power or magnifying power of the lens. The lenses can be used in combination with each other to further increase magnification. When two or more lenses are used together, the stronger or strongest lens should be the closer or closest to the camera lens.

Table V compares the original size to the close-up lens magnification required, depending on the focal length of the camera lens. The smaller the original size, the greater the magnification required. From this table, it can be determined the type and number of close-up lenses required to photograph the original. The field size refers to the size of the original to be photographed and is measured in inches. From the

TABLE V

CLOSE-UP LENS TABLE BASED ON THE USE OF THREE CLOSE-UP LENSES 1+, 2+, AND 3+ POWERS OF MAGNIFICATION, FOR USE WITH 35mm. CAMERAS

Close-Up lenses and focus setting (in feet)		Lens-to-subject distance (inch)	Approx. Field Size (Original Size) (in inches) based on picture area of slide	
			44-46mm lens	50mm lens
1+	Inf.	39"	20 x 29 3/4"	18 x 26 3/4"
	15'	32 1/4	16 x 24 1/2	14 3/4 x 22
	6	25 1/2	13 x 19 1/4	11 3/4 x 17 1/4
	3 1/2	20 3/8	10 3/8 x 15 1/4	9 3/8 x 13 3/4
2+	Inf.	19 1/2	10 1/8 x 15	9 x 13 1/2
	15	17 3/4	9 1/8 x 13 1/2	8 1/8 x 12
	6	15 1/2	7 7/8 x 11 3/4	7 1/8 x 10 1/2
	3 1/2	13 3/8	6 7/8 x 10 1/8	6 1/8 x 9 1/8
3+	Inf	13 1/8	6 3/4 x 9 7/8	6 x 8 7/8
	15	12 1/4	6 1/4 x 9 1/4	5 5/8 x 8 3/8
	6	11 1/8	5 5/8 x 8 3/8	5 1/8 x 7 1/2
	3 1/2	10	5 1/8 x 7 1/2	4 5/8 x 6 3/4
3+ plus 1+	Inf.	9 7/8	5 x 7 3/8	4 1/2 x 6 5/8
	15	9 3/8	4 3/4 x 7	4 1/4 x 6 3/8
	6	8 5/8	4 3/8 x 6 3/8	4 x 5 7/8
	3 1/2	8	4 1/8 x 6	3 5/8 x 5 3/8
3+ plus 2+	Inf.	7 7/8	4 x 5 7/8	3 5/8 x 5 3/8
	15	7 1/2	3 7/8 x 5 3/4	3 1/2 x 5 1/8
	6	7 1/8	3 5/8 x 5 3/8	3 1/4 x 4 7/8
	3 1/2	6 5/8	3 3/8 x 5	3 x 4 1/2
3+ plus 3+	Inf.	6 5/8	3 3/8 x 5	3 x 4 1/2
	15	6 3/8	3 1/4 x 4 3/4	2 7/8 x 4 1/4
	6	6	3 1/8 x 4 1/2	2 3/4 x 4 1/8
	3 1/2	5 5/8	2 7/8 x 4 1/4	2 5/8 x 3 7/8

[a]Eastman Kodak Company, Kodak Master Photoguide, 1971, p. 27.

field size, the lens to subject distance is determined, what close-up lens attachments are required and what the focus setting is. This table simplifies the procedure and prevents the use of a trial-and-error method of close-up lens selection and focus settings.

Slide Film

For copy photography for slide reproductions, the choice of film will be dependent upon the following factors:

1. Choice of color or black and white.
2. Light source.
3. Color balance.
4. Definition of picture.
5. Original type.

There are many slide films on the market such as Fuji, GAF and Kodak film. Not denying the flexibility and availability of the other slide films, Kodak was selected for the constructed slides in the paper because of its universality and available processing outlets. With Kodak films, a wide range of choice exists to satisfy the above six criteria and still remain within one distributor's line of products. Table VI has been compiled by the Kodak Research Laboratories to compare the film types utilized and their corresponding characteristics. It must be noted that the film types are classified according to the light source (daylight, tungsten, photo-lamps) they are balanced for. They must be used in the proper light for the color recorded by the film to be correct and natural.

TABLE VI

CLASSIFICATION OF FILM TYPES

NAME	TYPE	FILM SPEED ASA	LIGHT SOURCE	DEFINITION# GRAININESS	RESOLVING POWER	SHARPNESS
Kodachrome II	color	25	daylight	extremely fine	high	high
Kodachrome II Professional (Type A)	color	40	photo lamps	extremely fine	high	high
Kodachrome-X	color	64	daylight	extremely fine	high	high
Kodak High Speed Ektachrome	color	160* 400**	daylight	extremely fine	medium	medium
Kodak High Speed Ektachrome (tungsten)	color	125	tungsten	very fine	low	low
Kodak 5254***	color	100 200 400	daylight or tungsten	fine fine fine	medium low low	medium low low
Panatonic-X++	black and white	32	daylight or tungsten	extremely fine	extremely high	very high

\# definition as determined by Kodak Laboratories.
* ASA 160 is the normal film speed.
** for processing at ASA 400 requires special developing techniques.
*** can be obtained from Kim Labs, P.O. Box 89, University Station, Seattle, Washington 98105, U.S.A.
++ is a print film and requires special processing to be converted to slides.

[a]Eastman Kodak Company, Kodak Films for the Amateur, 1971, p. 35.

Pictures made on daylight-type film in fluorescent light without a filter may be acceptable but will usually have a greenish cast. Tungsten film used without filters in daylight produces pictures that appear predominately blue in color. The light source used to illuminate the original will determine the choice of film.

Selection of a film to suit the particular original is the most important consideration. The originals can be classified into two types:

1. Continuous tone originals--such as photographs, paintings, pictures, charcoal and crayon drawings, and etchings.
2. Line originals--such as documents, blueprints, manuscripts, printed materials. Pencil drawings, handwritten manuscripts and letters, etchings, and crayon drawings consist of lines but cannot be copied as line work. This is due to the fact that this type of original consists of lines that are not of uniform or equal density and are in fact lines of continuous toning. To copy them on a line original film would result in the loss of this toning and a reproduction that is harsh and defined.

Graphics

Graphics, used as titles and information or to acknowledge credits, can be prepared easily and with minimum expense. Letraset lettering (transfer lettering) was used for the graphics in the slide series in the study. The letters were placed on colored background and were

reproduceced through the copying technique. Letters on a blackboard or words from magazines can easily be copied for graphic use. Words can be typed on cards and photographed. The varieties are endless and depend upon the imagination of the photographer.

CHAPTER III

ANALYSIS OF THE COMPLETED SLIDE SERIES

Introduction

Seven slide series were constructed for the purpose of operationalizing the procedural method, demonstrating the copying techniques, and allowing for an assessment of both technical quality and procedure. This section provides a fact sheet on each slide series providing title of the series, concept and generalization developed, grade application of the series, learning goal and a summary of the content. The series are displayed in Appendix C of the study in a pocket page style allowing for easy removal for hand viewing. A listing of source materials for all slides displayed is located in Appendix A.

THE SLIDE SERIES

Concepts

The following concepts selected from the Social Science disciplines serve as organizers for the structuring of the learning experiences provided by the slide visuals:

CULTURE	TIME	SELF-CONCEPT
CAUSE	SOCIAL FORCE	POWER
EFFECT	PHYSICAL FORCE	LEGITIMACY
CHANGE	SOCIETY	REVOLUTION
	VALUES	

The learner develops and applies the specific concepts for each series to formulate warranted generalizations. The title and the generalization drawn for each slide series are provided in the following list.

Titles and Generalizations

TITLE	GENERALIZATION
Elizabethan England: A Stage for Man	Elizabethan England was a stage upon which the amazing creative faculties of the Renaissance were displayed.
Change: The Price of Time	Change is a condition of human society. History is change, things and events are in continual transition.
The Grandeur and Might that was: Rome: The Thirteen Hundred Years	Culture as a way of life of a group of people is influenced by the environment in which it is located. Overt aspects of a culture can be understood through the study of a culture's artifacts.
Questions of Our Time	The Industrial Revolution offered a new way of life to an industrialized world--as well as consequent evils reflected in our society today.
The Absolute and the Peasant	A cause of the violent replacement of existing governments is an unequal distribution of wealth between the governors and the governed and the government's unresponsive action to change.
Refuge from a Hostile World	In times of stress man seeks protection; protectors emerge as a military force making demands in return for their services.
From the Divine to the Man	The Renaissance represents a challenge to the Medieval way of life; Renaissance artists expressed a new interest in worldly things as distinct from the medieval preoccupation with spiritual matters.

Matrix I details the relationships between the concepts and the visual materials through which the learner will develop those specified concepts. The visuals provide the learning experiences necessary for learner conceptual development. Concepts developed in early slide series are applied to new situations in subsequent slide series, thus providing a situation where transfer of learning can occur.

MATRIX I

RELATIONSHIPS BETWEEN SLIDE SERIES AND THE CONCEPTS UTILIZED AS ORGANIZERS OF VISUALLY PRESENTED MATERIALS

CONCEPTS / SLIDE SERIES	Elizabethan England: A Stage for Man	Change: The Price of Time	The Grandeur and Might that was: Rome: The Thirteen Hundred Years	Questions of Our Time	The Absolute and the Peasant	Refuge from a Hostile World	From the Divine to the Man
Culture	X	X	X	X	X	X	X
Cause	X	X	X	X	X	X	X
Effect	X	X	X	X	X	X	X
Change		X		X	X	X	X
Time		X		X			X
Social Force	X		X		X	X	X
Physical Force		X	X				
Society	X		X	X	X	X	X
Values	X		X	X	X	X	X
Self-Concept	X			X	X	X	X
Power			X		X	X	
Legitimacy					X		
Revolution				X	X		

SUMMARY OF VISUAL CONTENT

Title: Elizabethan England: A Stage for Man

Concepts. Culture, cause, effect, social force, society, values, self-concept.

Generalization. Elizabethan England was a stage upon which the amazing creative faculties of the Renaissance were displayed.

Learning Goal. The student will apply the understandings of the Renaissance to the age of Elizabeth in England.

Content Reflected in Visuals.

- Renaissance--an observation of the spirit of the age as reflected in art, literary achievement, social customs, dress, homes and the desire of man to seek the unknown.

- specifically the social and economic change is made apparent through the Court of Elizabeth, the works of Shakespeare, the discoveries of Drake and general economic prosperity.

Title: Change: The Price of Time

Concepts. Culture, cause, effect, change, time, physical force.

Generalization. Change is a condition of human society. History is change; things and events are in continual transition.

Learning Goal. The student will recognize three aspects of change through time as decay, transformation and continuity.

Content Reflected in Visuals.

- the cultures of the Stone Age, the Middle Ages, the Renaissance; the Industrial and Political revolutions of the modern era; and the

twentieth century world all provide examples of the three aspects of change through time.

- there is no attempt to sequence the visuals chronologically. The three aspects of change are not separated or isolated as three independent entities.

Title: The Grandeur and Might that was: Rome: The Thirteen Hundred Years

Concepts. Culture, cause, effect, physical force, social force, society, values, power.

Generalization. Culture as the way of life of a group of people is influenced by the environment in which it is located. Overt aspects of a culture can be understood through the study of a culture's artifacts.

Learning Goal. The student will determine that Roman culture was military or conflict oriented, reflected engineering genius and was influenced by the environment.

Content Reflected in Visuals.

- Pompeii, Verona, Rome, Roman Britain, and Segovia, Spain serve as sources for the visuals reflecting the Roman way of life.

- engineering masterpieces such as the Forum of Rome, amphitheatre of Verona, the Pantheon, Segovia aqueduct are examples of slides in the series.

- Pompeii was the major source of art works, specifically frescoes, exhibiting Roman society.

Title: Questions of Our Time

Concepts. Culture, cause, effect, change, time, society, values, self-concept, revolution.

Generalization. The Industrial Revolution offered a new way of life to an industrialized world--as well as consequent evils reflected in our society today.

Learning Goal. The student will relate many of the social problems of the present society to their origins in the Industrial Revolution and the subsequent urbanization.

Content Reflected in Visuals.

- the major problems of our present society: pollution, crowded conditions of the urban scene, youth alienation, crime, poverty, the pace of life, are reflected in the visuals.

- Winnipeg and Winnipeg people are one source of pictures, with National Geographic Magazine providing the majority of reproduced pictures on crime, poverty and pollution.

Title: The Absolute and the Peasant

Concepts. Culture, cause, effect, change, social force, society, values, self-concept, power, legitimacy, revolution.

Generalization. A cause of the violent replacement of existing governments is an unequal distribution of wealth and the government's unresponsive action to change.

Learning Goal. The student will explain that one cause of revolt of the people is the unequal distribution of wealth where the governing class is very rich and the class of governed is very poor.

Content Reflected in Visuals.

- the Revolutions of 1848 and the French Revolution set the scene for the visuals.

- works by artists such as the Limbourg Brothers, Pierre Mignard, Jean Baptiste Audry, Francois Bouchet, Chardin, and Giacomo Ceruti provide scenes of the poverty of rural France, the grandiose courts of the French kings at Versailles and Paris and the bloodshed of the revolutions.

Title: Refuge from a Hostile World

Concepts. Culture, cause, effect, change, social force, society, values, self-concept, power.

Generalization. In times of stress man seeks protection; protectors emerge as a military force making demands in return for their services.

Learning Goal. The student will establish that the desire for security by the peasant class in the Middle Ages allowed a military class of knights to emerge to protect it and in return demand services and servitude from the peasants.

Content Reflected in Visuals.

- the Viking ships of Oslo and Copenhagan set the mood for the visuals.

- castles of England, Scotland and Wales such as: Dover Castle; Bodiam Castle; Sussex, England; Alnwick Castle, Northumberland, England; Girnigoe Castle, Wick, Scotland; Laugharne Castle, Carmarthen, Wales; Kidwelly Castle, Llanelli, Wales; Rhuddlan Castle, Rhyl, Wales; and

the Tower of London are pictured as well as medieval works of art displaying the life of the serf and his protector, the Knight.

Title: From the Divine to the Man

Concepts. Culture, cause, effect, change, time, social force, society, values, self-concept.

Generalization. The Renaissance represents a challenge to the medieval way of life. Renaissance artists expressed a new interest in worldly things as distinct from the medieval preoccupation with spiritual matters.

Learning Goal. The student will contrast the change in beliefs and attitudes and ultimately the life style between the Middle Ages and the Renaissance as reflected by art and architecture examples of each period.

Content Reflected in Visuals.

- examples of medieval art and architecture (castles and cathedrals) are contrasted to examples of Renaissance works of art and architecture.

- Michelangelo provides the source for Renaissance art with the Sistene Chapel and the "David" as central.

- Metz Cathedral with its gothic flying buttresses is contrasted to the lofty classical Renaissance grandeur of Medici Chapel in Florence.

- Medieval art examples are reproduced from the Gospel Book of Otto III, and works of Giotto and Simone Martini.

The grade application refers to the application of the slide series as completed and illustrated, although removal or addition of slides will provide each series with greater grade versatility in its application. This is discussed in detail in Chapter Four. (refer Table VII)

TABLE VII

GRADE APPLICATION OF COMPLETED SLIDE SERIES

TITLE	GRADE		
	Seven	Eight	Nine
Elizabethan England		X	X
Change: The Price of Time	X	X	X
The Grandeur and Might that was: Rome: The Thirteen Hundred Years	X		X
Questions of Our time		X	X
Refuge From a Hostile World	X		X
From the Divine to the Man		X	X

CHAPTER IV

A PROCEDURAL METHOD FOR THE CONSTRUCTION OF SLIDE VISUALS FOR LEARNING OBJECTIVES

Introduction

The course of study guides provide the course content and topical restrictions. Concepts, their selection and application, are at the discretion of the teacher. Once the decision has been made regarding what concepts are to be developed visually, a procedure is necessary for the construction of visuals to provide the student with the necessary learning experiences for conceptual development. This development can not be arbitrary and must be measurable. The learning experiences must demand certain behaviors by the student. The expression of these behaviors will indicate to the teacher the degree of conceptual development by the learner. In other words, not only will the acquisition of specific instances of the concept be measured, but concept application as well. The learning experiences are provided for student achievement of a specific learning objective or learning goal. The learning objective determines the selection of slides or pictures to provide the experience for learning.

The procedure is a step-by-step method for picture selection as determined by the learning objectives as established by the teacher for a given student or group of students. The concepts are the initiates of the procedure, but the learning objectives or goals are dependent upon the content and the learning processes that are to be utilized by the

students in the expression of goal behavior. The selection of the specific content is derived from the cognitive structures of the students at the point of entry into the learning experience. The selection of the learning processes is also dependent upon the cognitive structures which determines their capabilities in utilizing various learning processes. These are the antecedent conditions to the procedure.

The junior high student, functioning within the cognitive domain, can operate at the levels of synthesis and evaluation. The slide series require student behavior indicating learning processes ranging from the simple acquisition of knowledge to the most complex processes of evaluation. The series are constructed for use in grade nine, as the learning objectives indicate an accumulation of prior knowledge from grade seven and grade eight.

The relationships between units, concepts, behaviors and content are expressed through the use of matrices. The correlations of each matrix are dependent upon those preceding. The matrices are completed in this paper to demonstrate their application to the procedure. The data is totally dependent upon the given situations provided. The teacher has the most vital role in the implementation of the procedure as he must interpret the cognitive structure of the student, must function within the course of study limitations and must devise visuals to provide learning experiences to be contingent with the above two factors which will allow for conceptual development by the learner.

Relationships between Topics and Concepts

The visual materials are determined by the concepts. The concepts are developed and applied through content materials as selected by the course of study guides. The three study guides are:

1. Department of Youth and Education, Grade Seven History, Province of Manitoba, 1970.
2. Department of Education, Grade Eight Social Studies, Modern European History, Province of Manitoba, 1969.
3. Department of Education, Grade Nine History, The British Heritage, Province of Manitoba, 1972.

A second determining factor in concept selection is the textbooks used as resources for the course. The texts are selective in content and this will limit the application of the concepts to new and differing situations. For example, the concept of kingship for the grade seven student will be developed and applied only to history prior to the European Renaissance. The following textbooks were approved by the Curriculum Branch, Department of Education, Province of Manitoba, March 1973 for use in junior high history:

M. C. McCarthy (ed.), The Human Adventure Series:

1. Ancient Civilization
2. Greek and Roman Civilization
3. Medieval Civilization
4. The Age of Western Expansion
5. The Interaction of Culture
6. The New World and Eurasian Cultures

Toronto, Macmillan: Allyn and Bacon, 1971.

J. D. Bareham, Changing World History Series: Book I: Beginnings. Holmes McDougall (Griffin House Canada), 1969.

V. H. Cassidy and J. Southerworth, Long Ages in the Old World. Downsview, Ontario: Charles E. Merrill, 1969.

T. K. Derry et al, Great Britain. Canada: Oxford University Press, 1962.

G. E. Tait, Proud Ages. Toronto: Ryerson Press, 1958.

R. J. Lambert, The Great Heritage: A History of Britain for Canadians. Toronto: The House of Grant, 1964.

J. Trueman, Britain: The Growth of Freedom. Toronto: J. M. Dent and Sons, 1960.

J. Ricker and J. Saywell, The British Heritage. Toronto: Clarke, Irwin.

_____, Europe and the Modern World. Toronto: Clarke, Irwin.

_____, The Emergence of Europe. Toronto: Clarke, Irwin.

The selected areas of content topics for this purpose are:

Grade 7: 1. Stone Age-culture

2. Rome: -culture
-conflict

3. Middle Ages: -conflict
-military class
-architecture, art

Grade 8: 4. Renaissance: - spirit of the age
- art
- exploration and discovery

5. Nation States: -feudal lords
-absolute monarchy
-revolt and change

6. Industrial Revolution: -effects

7. Cultural Contributions of Europe:
   -art
   -architecture

8. 20th Century World: -culture

Grade 9: 9. Middle Ages, Feudal England: - social classes
   - conflict

10. Social and Economic Change, Sixteenth Century England: -prosperity
   -literary achievement
   -overseas expansion

11. Industrial Revolution: -effects

12. 20th Century World & Culture

Matrix II expresses the relationship between the topics, sub-topics, concepts and generalizations. Within the units, topics such as feudalism and the Renaissance are repeated but at different grade levels, therefore allowing for the application of concepts to new and differing situations. The matrix is a preliminary step to establishing the relationship between the learning goal and the material content of the goal. The establishment of the content to be utilized by the student is explained by the correlations on Matrix II. The development and application of the concepts is determined by the learning processes and the content materials utilized by the student to exhibit the desired goal behavior.

MATRIX II

RELATIONSHIP BETWEEN CONTENT, CONCEPTS AND GENERALIZATIONS

TOPICS DRAWN FROM COURSE SYLLABUS / CONCEPTS AND GENERALIZATIONS / SCOPE OF TOPICS (CONTENT)	Elizabethan England was a stage upon which the amazing creative faculties of the Renaissance were displayed	Change is a condition of human society. History is change, things and events are in continual transition	Culture, as the way of life of a group of people is influenced by the environment in which it is located. Overt aspects of a culture can be understood through this study of a cultures artifacts	The Industrial Revolution offered a new way of life--as well as consequent evils reflected in our society today	A cause of the violent replacement of existing governments is an unequal distribution of wealth and the government's unresponsive action to change	In time of stress man seeks protection; protectors emerge as a powerful military force making demands in return for their services	The Renaissance represents a challenge to the Medieval way of life. Renaissance artists expressed a new interest in worldly things as distinct from the medieval preoccupation with spiritual matters
Grade 7:							
1. Stone Age:							
- culture		X					
2. Rome:							
- culture			X				
- conflict			X				
3. Middle Ages:							
- conflict		X				X	X
- military class						X	X
- architecture							X
- art							X
Grade 8:							
4. Renaissance:							
- spirit of the age (culture)	X	X					
- art	X	X					X
- architecture	X	X					X
- exploration & discovery		X					X
5. Nation States:							
- feudal lords					X	X	
- absolute monarchy					X		
- revolt & change		X			X		
6. Industrial Revolution:							
- effects		X		X			

MATRIX II (continued)

RELATIONSHIP BETWEEN CONTENT, CONCEPTS AND GENERALIZATIONS

TOPICS DRAWN FROM COURSE SYLLABUS / CONCEPTS AND GENERALIZATIONS SCOPE OF TOPICS (CONTENT)	Elizabethan England was a stage upon which the amazing creative faculties of the Renaissance were displayed	Change is a condition of human society. History is change, things and events are in continual transition	Culture, as the way of life of a group of people is influenced by the environment in which it is located. Overt aspects of a culture can be understood through this study of a culture's artifacts	The Industrial Revolution offered a new way of life—as well as consequent evils reflected in our society today	A cause of the violent replacement of existing governments is an unequal distribution of wealth and the government's unresponsive action to change	In time of stress man seeks protection; protectors emerge as a powerful military force making demands in return for their services	The Renaissance represents a challenge to the Medieval way of life. Renaissance artists expressed a new interest in worldly things as distinct from the medieval preoccupation with spiritual matters
7. Cultural Contributions of Europe:							
- art		X	X				X
- architecture		X	X				X
8. Twentieth Century World:							
- culture		X		X			
Grade 9:							
9. Feudal England:							
- social class						X	
- conflict						X	
10. Sixteenth Century England:							
- prosperity	X						X
- literary achievement	X	X					X
- overseas expansion	X	X					X
11. Industrial Revolution:							
- effects		X		X			
12. Twentieth Century World & Culture		X		X			

Relationships between Content and Learning Goals

The learning goals, the outcomes of the teaching-learning process, are determined by the teacher. The learning goals indicate the learning processes to be utilized by the student in the development of the concepts. Based upon the concepts to be applied and generalizations to be drawn by the student within the scope of topics as illustrated by Matrix I, the seven learning goals are as follows:

Given a visually displayed slide series, the student will be able to -

1. Apply the understandings of the Renaissance to the age of Elizabeth in England.
2. Recognize three aspects of change through time as decay, transformation, and continuity.
3. Determine that Roman culture was military or conflict oriented, reflected engineering genius and was influenced by the environment.
4. Relate many of the social problems of the present society to their origin in the Industrial Revolution and the subsequent urbanization.
5. Explain that one cause of revolt of a people is the unequal distribution of wealth where the governing class is very rich and the class governed is very poor.
6. Establish that the desire for security by the peasant class in the Middle Ages allowed a military class of Knights to emerge to protect it and in return demand service and servitude from the peasants.

The learning goals indicate the student behavior necessary to indicate he has developed and applied the concept as required. For the student to be able to exhibit this behavior the teacher must provide him with the necessary visual content with which he can interact. The teacher must structure the learning experience and this experience is provided through a visually created environment. The visual environment is determined by Matrix III. The correlations indicate which content areas must be expressed visually to provide the student with the experiences necessary for goal attainment.

Relationship between Learning Goals and Learning Processes

Learning goals indicate content and specific behaviors. The student exhibits certain behaviors in his mental manipulation of the content to express goal achievement. To a given behavior the student must use certain learning processes as applied to certain content. The learning processes are determined by the goal. The learning processes required for goal attainment for the seven goals used as examples are as follows:

1.	Knowledge:	1.1 recalls visually displayed information 1.2 identifies sources
2.	Comprehension:	2.1 interprets meaning from visuals
3.	Application:	3.1 applies concepts to new situations 3.2 discovers relationships 3.3 predicts events or happenings
4.	Analysis:	4.1 identifies a problem 4.2 selects instances of a concept 4.3 infers conclusions

MATRIX III

RELATIONSHIP BETWEEN CONTENT AND LEARNING GOALS

TOPICS DRAWN FROM COURSE SYLLABUS / LEARNING GOALS -IN SEQUENCE FROM SIMPLE TO MORE COMPLEX BEHAVIORS / SCOPE OF TOPICS (CONTENT)	Apply the understandings of the Renaissance to the age of Elizabeth in England	Recognize three aspects of change through time as decay, transformation and continuity	Determine that Roman culture was military oriented, reflected engineering genius and was influenced by the environment	Relate many of the social problems of the present society to their origins in the Industrial Revolution and the subsequent urbanization	Explain that one cause of revolt of a people is the unequal distribution of wealth where the governing class is very rich and the class of governed is very poor	Establish that the desire for security by the peasant class in the Middle Ages allowed a military class of knights to emerge to protect it and in return demand service and servitude from the peasants	Contrast the change in belief and attitudes and ultimately the life style between the Middle Ages and the Renaissance as reflected by art and architectural examples of each period
Grade 7:							
1. Stone Age:							
- culture		X					
2. Rome:							
- culture			X				
- conflict			X				
3. Middle Ages:							
- conflict		X					
- military class						X	X
- architecture						X	X
- art							X
Grade 8:							X
4. Renaissance:							
- spirit of the age (culture)	X	X					
- art	X	X					X
- architecture	X	X					X
- exploration & discovery		X					X
5. Nation States:							
- feudal lords					X	X	
- absolute monarchy					X		
- revolt & change		X			X		
6. Industrial Revolution:							
- effects		X		X			

MATRIX III (continued)

RELATIONSHIP BETWEEN CONTENT AND LEARNING GOALS

TOPICS DRAWN FROM COURSE SYLLABUS / LEARNING GOALS -IN SEQUENCE FROM SIMPLE TO MORE COMPLEX BEHAVIORS / SCOPE OF TOPICS (CONTENT)	Apply the understandings of the Renaissance to the age of Elizabeth in England	Recognize three aspects of change through time as decay, transformation and continuity	Determine that Roman culture was military oriented, reflected engineering genius and was influenced by the environment	Relate many of the social problems of the present society to their origins in the Industrial Revolution and the subsequent urbanization	Explain that one cause of revolt of a people is the unequal distribution of wealth where the governing class is very rich and the class of governed is very poor	Establish that the desire for security by the peasant class in the Middle Ages allowed a military class of knights to emerge to protect it and in return demand service and servitude from the peasants	Contrast the change in belief and attitudes and ultimately the life style between the Middle Ages and the Renaissance as reflected by art and architectural examples of each period
7. Cultural Contributions of Europe:							
- art		X	X				X
- architecture		X	X				X
8. Twentieth Century World:							
- culture		X		X			
Grade 9:							
9. Feudal England:							
- social class						X	
- conflict						X	
10. Sixteenth Century England:							
- prosperity	X						X
- literary achievement	X	X					X
- overseas expansion	X	X					X
11. Industrial Revolution:							
- effects		X		X			
12. Twentieth Century World & Culture		X		X			

5. Synthesis: 5.1 explains casual relationships

6. Evaluation: 6.1 compares events or happenings
6.2 contrasts events or happenings

Not all series require the utilization of all processes by the student. This is a composite list of all processes used in all series. Matrix IV relates the learning goals and the learning processes. The correlations determine what specific processes must be used for goal attainment.

The two aspects or dimensions of the goals have been established. To relate the content and process dimensions of the goal requires the use of individual matrices for each learning goal. Matrix V provides an example of the matrix used for determination of content and behaviors for each individual learning goal. The data is obtained from Matrices III and IV. All goals for all slide series are provided as examples to demonstrate this relationship, as shown in the subsequent Matrices VI to XIII. Only two learning goals are analyzed in detail. Matrix VI exhibits the data for the learning goal: "the student will apply the understandings of the Renaissance to the age of Elizabeth I in England." Each correlation on the Matrix is a specific performance objective. The specific performance objective indicates the specific behavior, content and conditions under which the performance will occur. The conditions in this case are visual presentations. Each correlation does not necessitate one slide only, but indicates that a visual experience has been provided to reflect that content. It is on this Matrix that the actual decision is made by the teacher as to what visual content is necessary for the student to exhibit the required behaviors. The visuals provide an environment for learning

in which the student interacts with and displays the behavior necessary.

The matrix is then translated and a formal list of performance objectives are prepared. Referring to Matrix VIII, some examples of objectives might be:

Given a visual experience expressing change through historical periods of time, the student will be able to:

- recall six examples of change
- apply the concept to the students own life experiences
- select two examples portraying decay as an aspect of change through time
- select two examples portraying transformation as an aspect of change through time

Sequence Within the Slide Series

The structure of Matrix V, completed with data as Matrix VI, provides a guideline for the organization of the sequencing of the slides within the slide series. Matrix VI refers to the slide series titled Elizabethan England. The correlations are numbered as indicated.

A fundamental principle of learning theory states that learning procedes from the simple to the complex. Therefore the learning environment, specifically the resources of that environment, must be structured for the learning to proceed in this manner. The numerical ordering of the correlations of the Matrix serves to organize the specific instructional objectives from simple to complex. Thus, in this example, the visuals will be sequenced so that the student behaviors progress from the simple acquisition of knowledge to more complex behaviors.

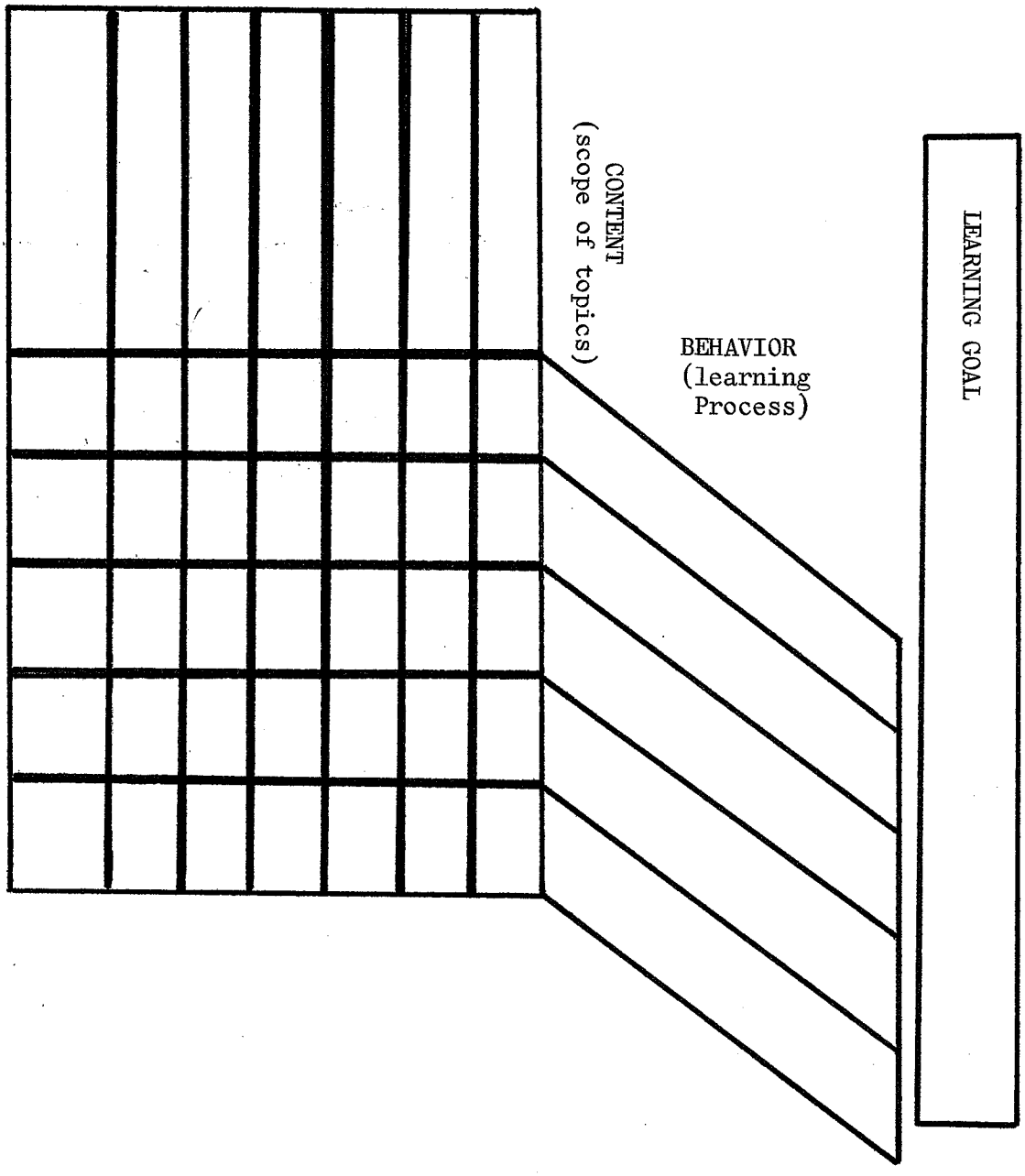
MATRIX IV

DETERMINATION OF SPECIFIC PERFORMANCE OBJECTIVES

LEARNING PROCESSES organized in sequential development from simple to complex / LEARNING GOALS: GIVEN A VISUAL PRESENTATION, THE STUDENT WILL BE ABLE TO:	Apply the understanding of the Renaissance to the age of Elizabeth in England	Recognize three aspects of change through time as decay, transformation and continuity	Determine that Roman culture was military or conflict oriented, reflected engineering genius and was influenced by the environment	Relate many of the social problems of the present society to their origins in the Industrial Revolution and the subsequent urbanization	Explain that one cause of revolt of a people is the unequal distribution of wealth while the governing class is very rich and the class of governed is very poor	Establish that the desire for security by the peasant class in the Middle Ages allowed a military class of knights to emerge to protect it and in return demand service and servitude from the peasants	Contrast the change in beliefs and attitudes and ultimately the life styles between the Middle Ages and Renaissance as reflected by art and architectural examples of each period.
1.1 recalls visually displayed information	X	X	X	X	X	X	X
1.2 identifies sources	X		X				
2.1 interprets meaning from visuals	X	X	X	X	X	X	X
3.1 applies concepts to new situations	X	X		X			
3.2 discovers relationships	X		X	X	X	X	X
3.3 predicts events or happenings		X	X	X	X	X	X
4.1 identifies a problem					X	X	
4.2 selects instances of a concept					X		
4.3 infers conclusions					X	X	X
5.1 explains causal relationships						X	
6.1 compares events or happenings							X
6.2 contrasts events or happenings							X

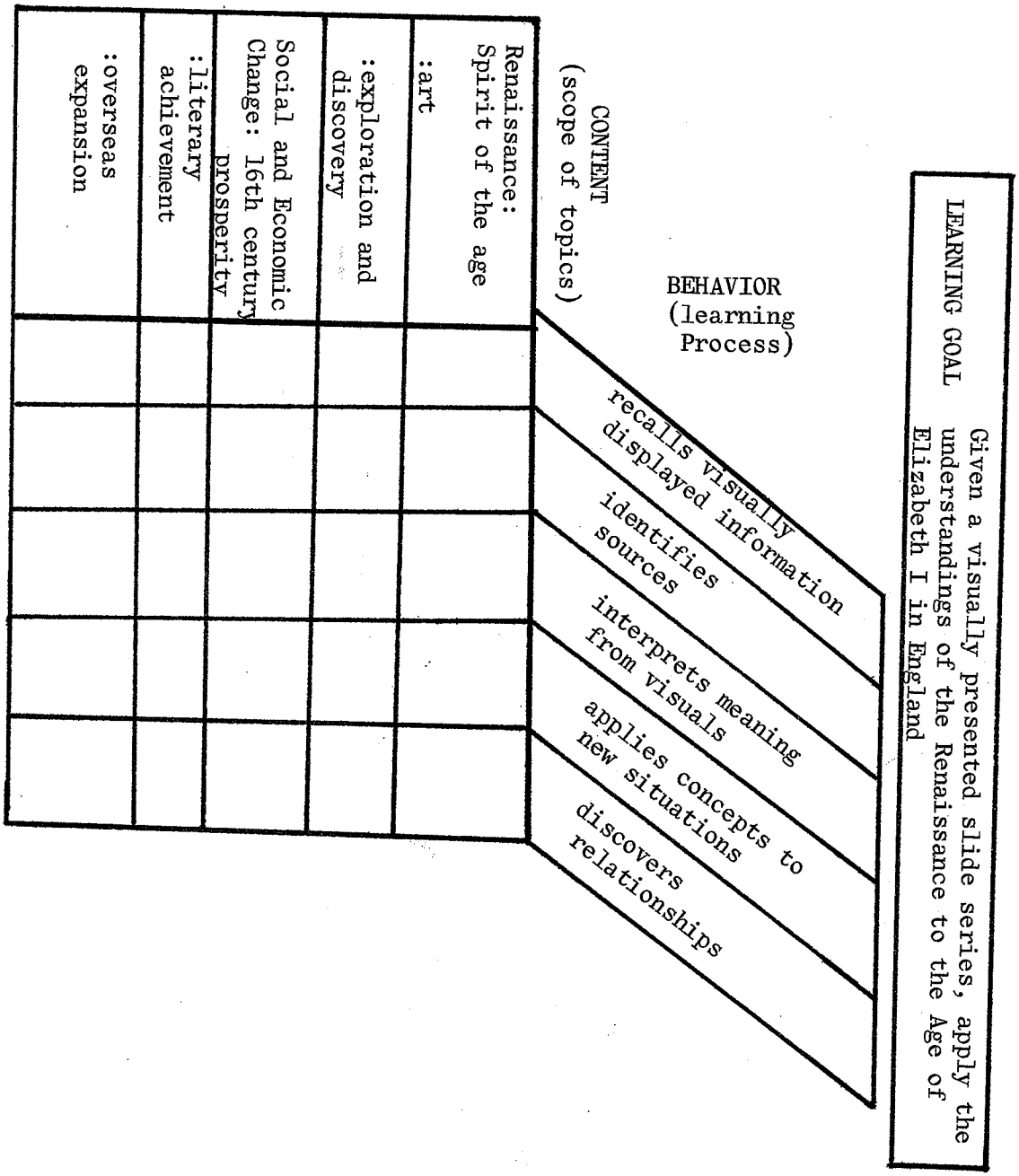
MATRIX V

MATRIX BASE FOR INSTRUCTIONAL PERFORMANCE OBJECTIVES



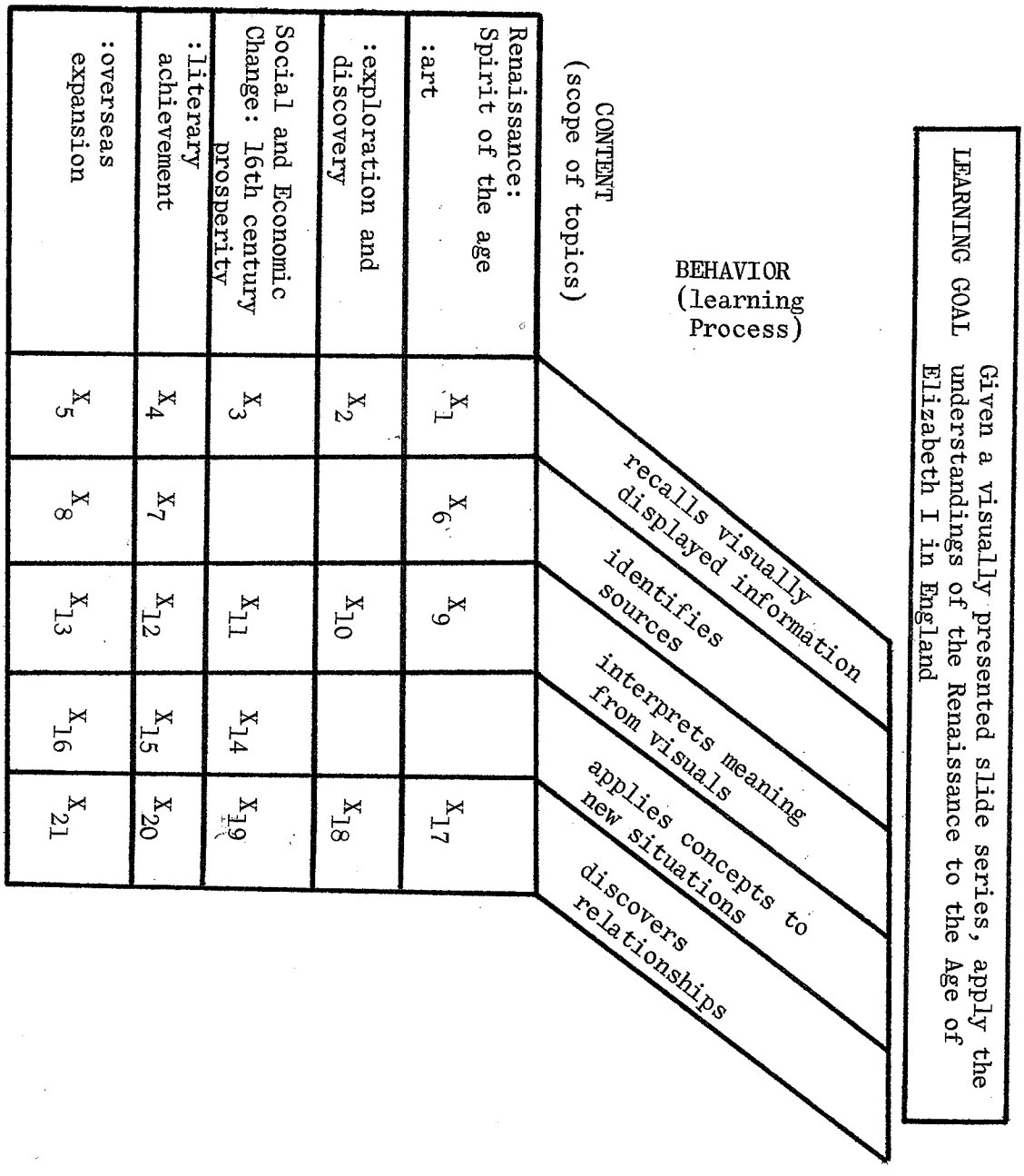
MATRIX VI

EXAMPLE OF MATRIX BASES FOR DETERMINING INSTRUCTIONAL PERFORMANCE OBJECTIVES AND THE SPECIFIC APPLICATION OF LEARNING PROCESSES TO SPECIFIED CONTENT AREAS - ELIZABETHAN ENGLAND: A STAGE FOR MAN PROVIDED AS AN EXAMPLE



MATRIX VII

MATRIX BASE FOR INSTRUCTIONAL PERFORMANCE OBJECTIVES - ELIZABETHAN ENGLAND: A STAGE FOR MAN



MATRIX VIII

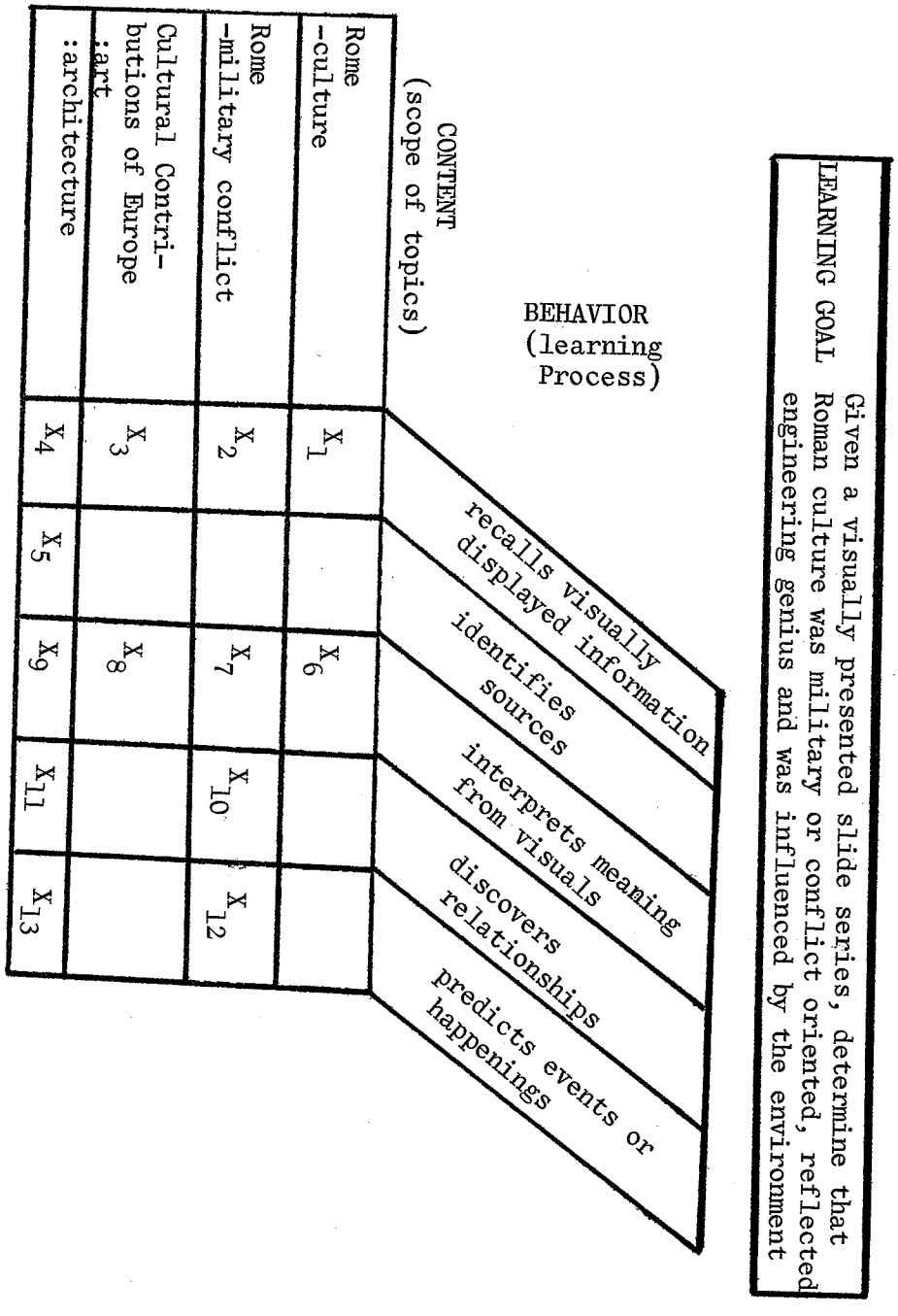
CHANGE: THE PRICE OF TIME

LEARNING GOAL: Given a visually presented slide series, the student will be able to recognize three aspects of change through time as decay, transformation and continuity

CONTENT (Scope of topics)	BEHAVIOR (learning Process)			
	recalls visually displayed information	Interprets meaning from visuals	Applies concepts to new situations	Predicts events or happenings
Stone Age Culture	X_1	X_9	X_{17}	
Middle Ages -military conflict	X_2	X_{10}	X_{18}	
Renaissance -spirit of the age	X_3	X_{11}	X_{19}	
Nation State -revolt & change	X_4	X_{12}	X_{20}	
Industrial Revolution - effects	X_5	X_{13}	X_{21}	
Cultural Contributions of Europe :art	X_6	X_{14}	X_{22}	
:architecture	X_7	X_{15}	X_{23}	
Twentieth Century Social Problems	X_8	X_{16}	X_{24}	X_{25}

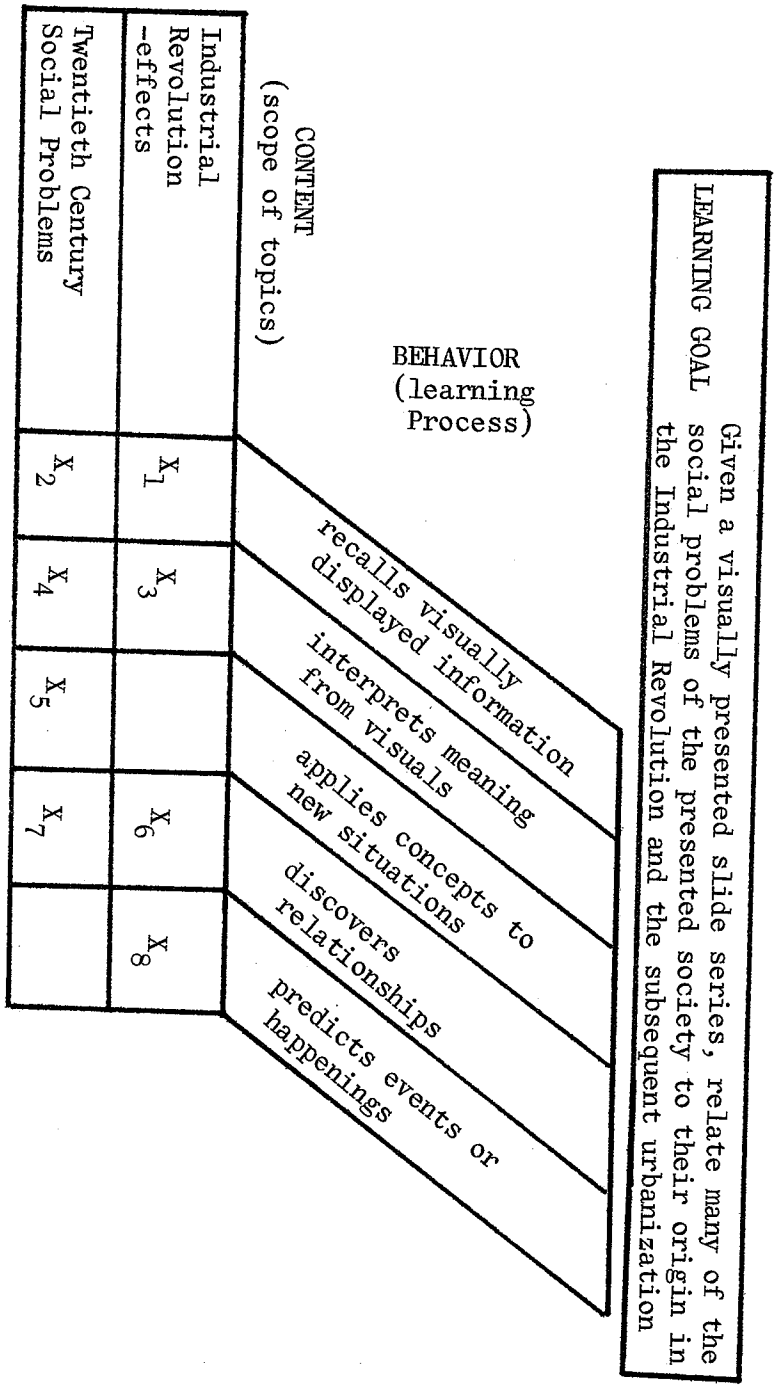
MATRIX IX

THE GRANDEUR AND MIGHT THAT WAS:
ROME: THE THIRTEEN HUNDRED YEARS



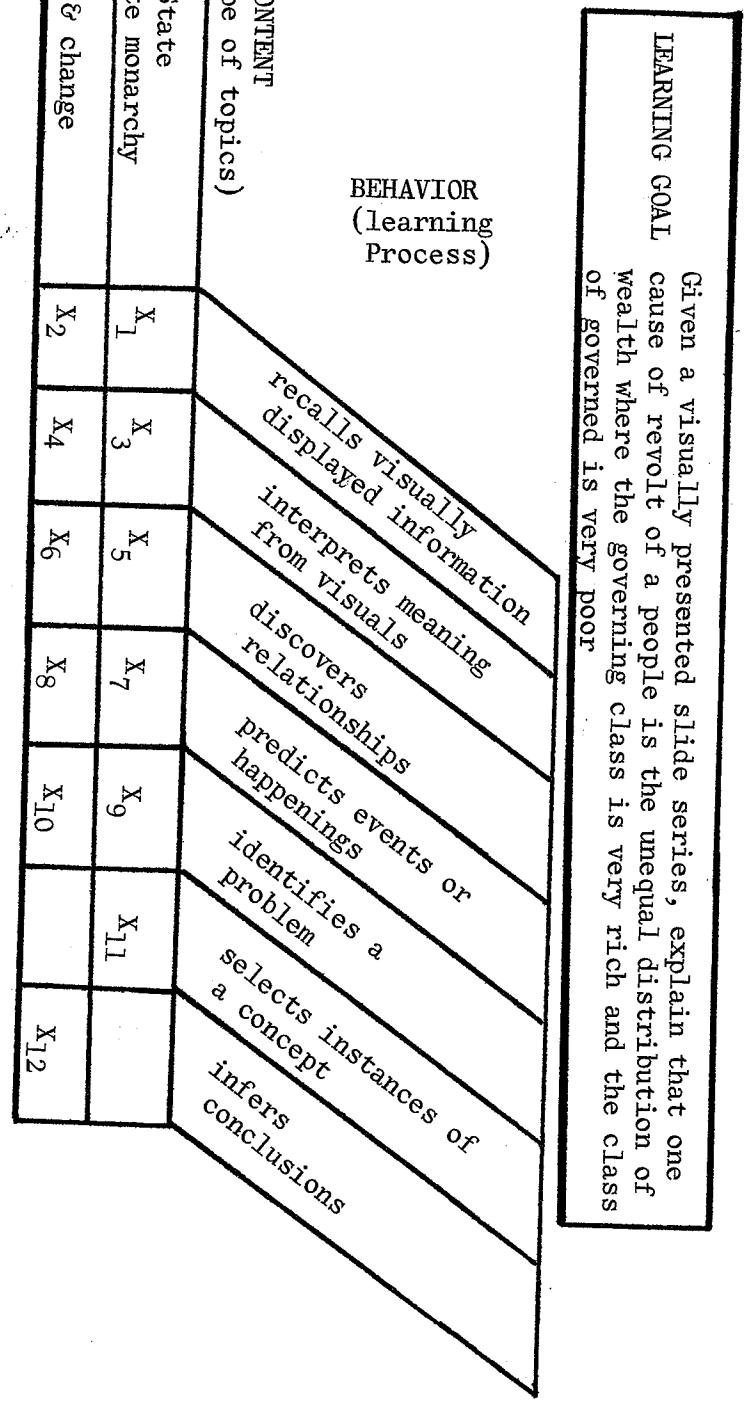
MATRIX X

QUESTIONS OF OUR TIME



MATRIX XI

THE ABSOLUTE AND THE PEASANT



MATRIX XII

REFUGE FROM A HOSTILE WORLD

LEARNING GOAL: Given a visually presented slide series, establish that the desire for security by the peasant class in the Middle Ages allowed a military class of Knights to emerge to protect it and in return demand service and servitude from the peasants

CONTENT (scope of topics)	recalls visually displayed information	interprets meaning from visuals	discovers relationships	predicts events or happenings	identifies a problem	infers conclusions	explains causal relationships
Middle Ages: :conflict	X_1	X_7	X_{13}				
:military class	X_2	X_8	X_{14}	X_{19}	X_{23}	X_{27}	X_{31}
:peasant class	X_3	X_9	X_{15}	X_{20}	X_{24}	X_{28}	X_{32}
:feudal lords	X_4	X_{10}	X_{16}	X_{21}	X_{25}	X_{29}	X_{33}
Feudal England: :social classes	X_5	X_{11}	X_{17}	X_{22}	X_{26}	X_{30}	X_{34}
:conflict	X_6	X_{12}	X_{18}				

BEHAVIOR (learning Process)

MATRIX XIII

FROM THE DIVINE TO THE MAN

LEARNING GOAL: Given a visually presented slide series, contrast the change in beliefs and attitudes and ultimately the life style between the Middle Ages and the Renaissance as reflected by art and architectural examples of each period

CONTENT (scope of topics)	BEHAVIOR (learning Process)							
	recalls visually displayed information	identifies sources	interprets meaning from visuals	discovers relationships	predicts events or happenings	infers conclusions	compares events or happenings	contrast events or happenings
Middle Ages:	X_1		X_{19}	X_{31}	X_{41}	X_{45}		
:conflict								
:military class	X_2		X_{20}					
:peasant class	X_3		X_{21}					
:architecture	X_4	X_{13}	X_{22}	X_{32}		X_{46}	X_{54}	
:art	X_5	X_{14}	X_{23}	X_{33}		X_{47}	X_{55}	
Renaissance:								
:spirit of age	X_6	X_{15}	X_{24}	X_{34}		X_{48}	X_{56}	
:art								
Cultural Contributions of Europe:	X_7	X_{16}	X_{25}	X_{35}		X_{49}	X_{57}	
:art								
:architecture	X_8	X_{17}	X_{26}	X_{36}		X_{50}	X_{58}	
Feudal England:								
:social classes	X_9		X_{27}	X_{37}				
:conflict	X_{10}		X_{28}	X_{38}	X_{42}	X_{51}		
Social & Economic Change. Sixteenth Century England	X_{11}		X_{29}	X_{39}	X_{43}	X_{52}		
:prosperity								
:literary achievement	X_{12}	X_{18}	X_{30}	X_{40}	X_{44}	X_{53}	X_{59}	

Each correlation may indicate one or more slides necessary to achieve the objective. Within each instructional objective, the selected slides must be sequenced to move from the familiar to the unfamiliar. If a particular slide or series of slides can be utilized to achieve more than one specific instructional objective, the slide or slides are placed in the highest sequential ordering representing the most complex learning process.

Procedural Variables and Individualization

The schematic of procedure Figure 11 illustrates the relationships between the composite elements of the procedure and Figure 12 demonstrates the outcome of this relationship, the actual slide selection. All elements are possible variables in the procedure. The procedure, as a process, is independent of the variables and exists as an independent entity. For the purpose of the paper, the curricular topics and concepts are regarded as static elements. If the procedure is applied to different topics at different grade levels, the concepts and curricular topics will be variables. Schematic Figure 13 defines the preconditions as delineated by the selection of topics and concepts. These conditions are prerequisite to the implementation of the procedure in a practical application. The conditions remain constant throughout the application of the variables.

The student entry behavior is a variable therefore determining the learning goals and the consequent picture and slide choice. The procedure is designed to be adapted to the needs of differing classrooms, groups within a classroom or individuals within a classroom. Depending upon student experiences and cognitive structure, the

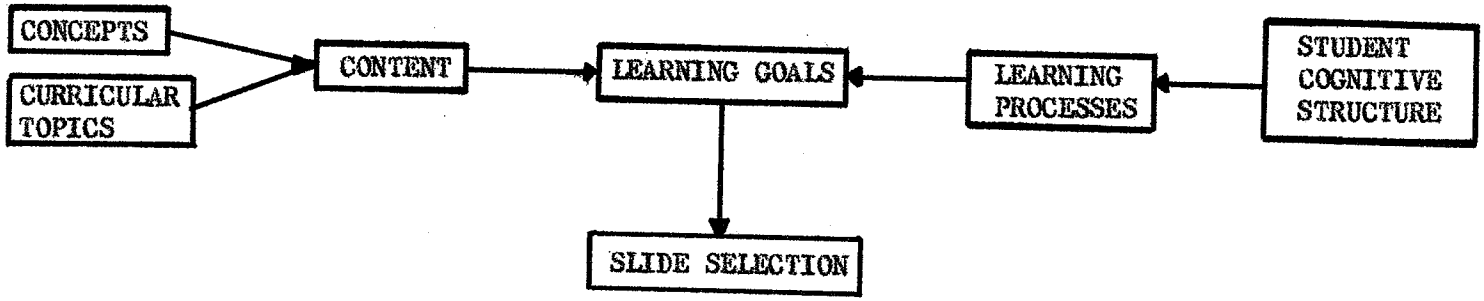


FIGURE 11

SCHEMATIC OF PROCEDURE
RELATIONSHIPS BETWEEN ELEMENTS OF PROCEDURE
IN SLIDE SELECTION FOR THE PURPOSE OF
CONCEPTUAL DEVELOPMENT

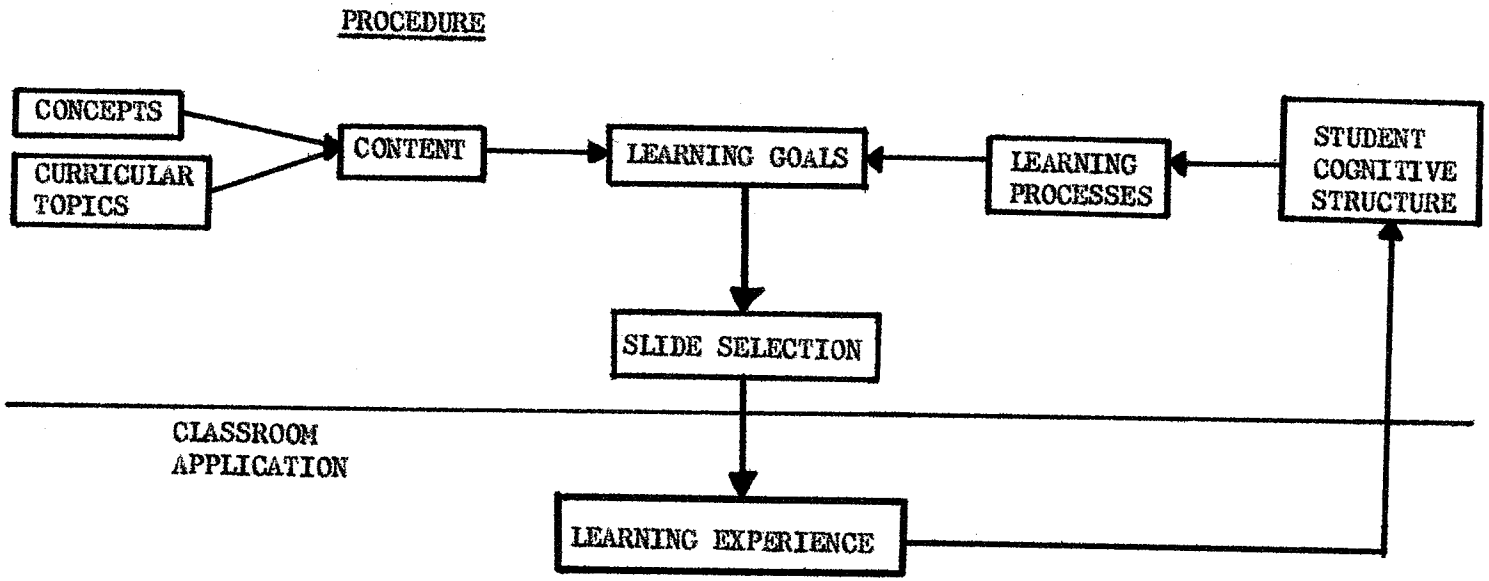


FIGURE 12

SCHEMATIC OF PROCEDURE
RELATIONSHIPS BETWEEN ELEMENTS OF PROCEDURE IN SLIDE SELECTION FOR THE PURPOSE OF CONCEPTUAL DEVELOPMENT. OUTCOME OF PROCEDURAL METHOD IS SLIDE SELECTION. OUTCOME OF APPLICATION OF PROCEDURAL METHOD TO THE CLASSROOM IS LEARNING EXPERIENCE.

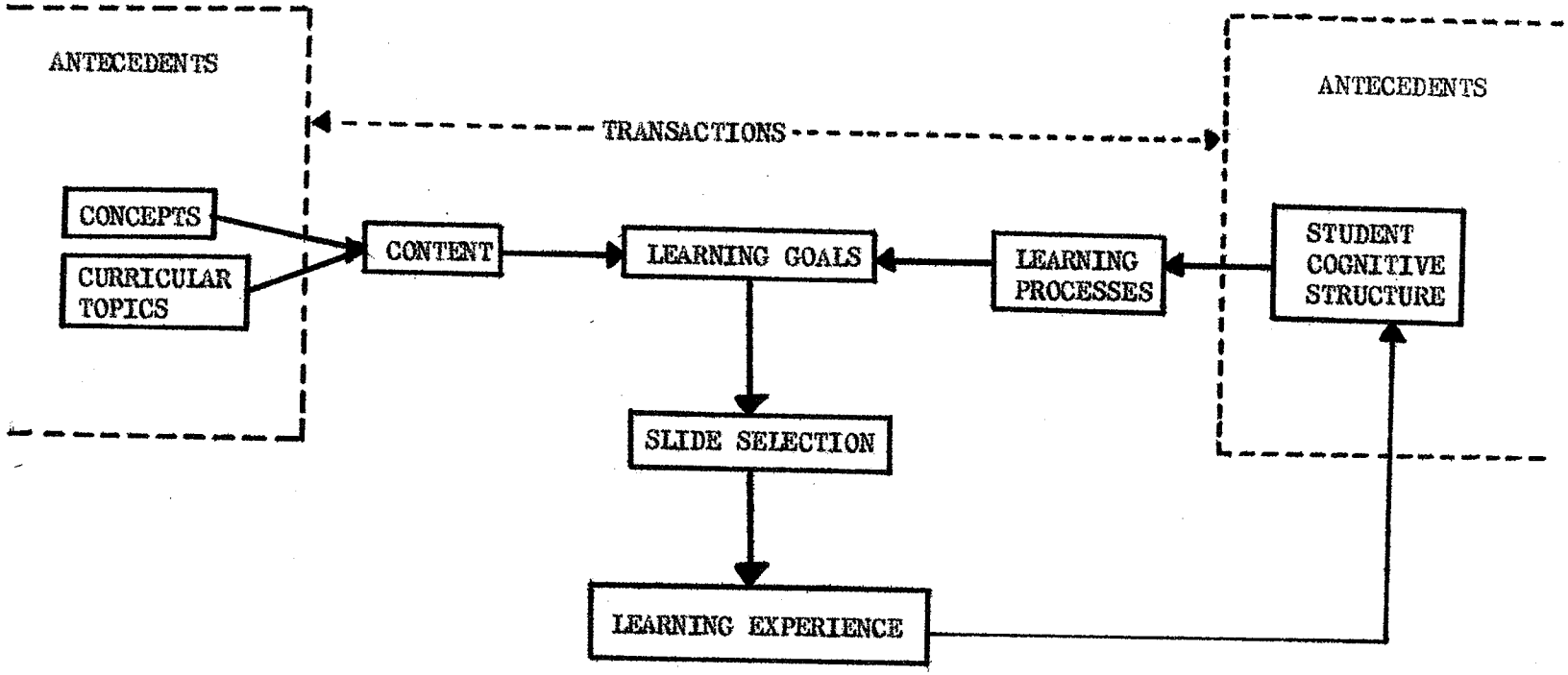


FIGURE 13

SCHEMATIC OF PROCEDURE
ANTECEDENTS OR PRECONDITIONS OF PROCEDURE
FOR A GIVEN STUDENT OR COURSE

learning goals will vary. These antecedent conditions are the major criteria in determining the learning goals and the criterial variables of the procedure.

Essentially, the procedure is one of diagnosis and prescription. The teacher diagnoses the prior conditions through the use of pre-testing devices and prescribes the learning goals dependent upon the determined prior conditions. Schematic of Procedure Figure 14 illustrates this relationship of diagnosis and prescription.

Outcome of Procedure

The procedure in its entirity is structured to meet the needs of the student and the demands of discipline and curricular guidelines. The procedure, although structured, is one of total flexibility. An essential tool in the implementation of the procedure is the matrix, upon which the elements of the procedure exist in inter-relationships which determine slide selection. The application of the matrix necessitates an understanding of student behavior and learning.

The outcome of the procedure is the actual slide selection. The transactions within the procedure are the selection of content and learning processes, based upon a diagnosis of the concepts and student cognitive behavior, to determine the specific learning objectives and learning goal. The slides selected do not simply meet content demands but are selected to provide a learning experience to achieve learning objectives and goals. The outcome of the application of the slides to the classroom is the actual creation of a learning experience for the student to interact with and exhibit the desired and determined behaviors.

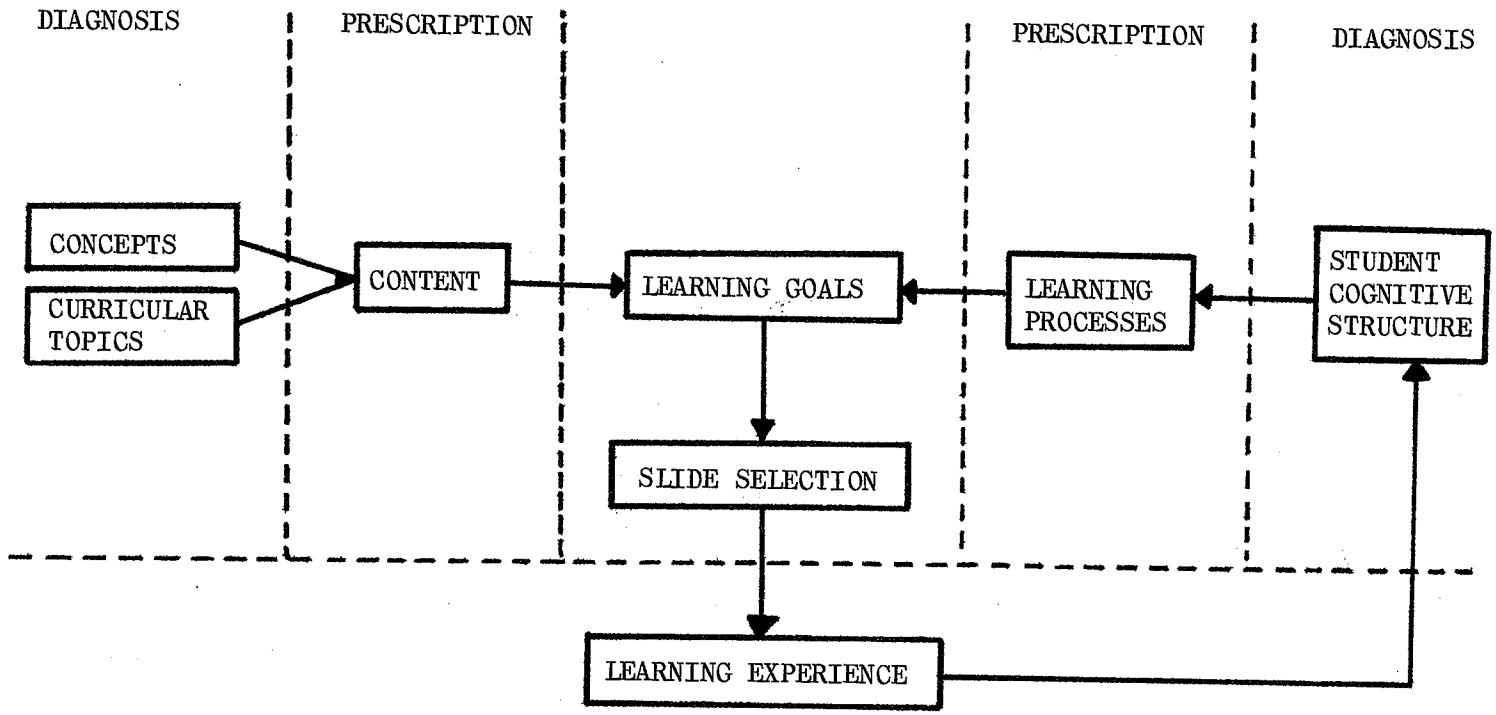


FIGURE 14

SCHEMATIC OF PROCEDURE
DIAGNOSIS AND PRESCRIPTION IN THE PROCEDURAL METHOD
FOR SLIDE SELECTION FOR CONCEPTUAL DEVELOPMENT

CHAPTER V

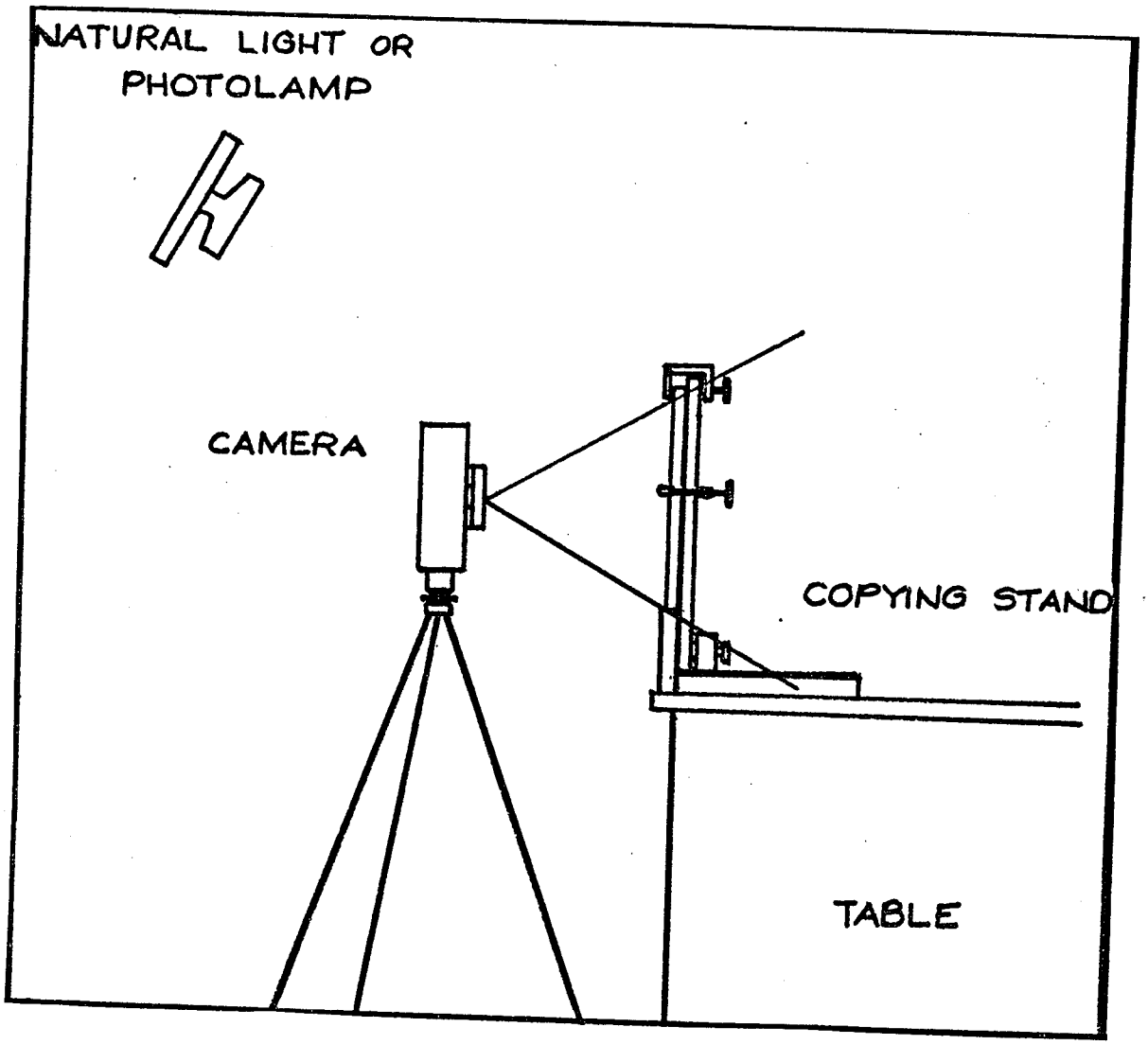
COPYING TECHNIQUE FOR SLIDE REPRODUCTIONS

Introduction

The purpose of the chapter is to outline a method or procedure for copying in photography. The slide series are a combination of real pictures or on-location photography and reproductions, achieved through a copying process. On-location photography requires basic skills in camera operation and will not be emphasized in the procedure. Camera operation is analyzed only in reference to copying techniques. The procedural method is a step-by-step operation requiring a minimum of tools, skills and expense. The basic equipment for the copying procedure is a camera and film, a copyboard and a source of light to illuminate the original to be copied. (refer figures 15,16,17,18)

Copying Stand

The copying stand, constructed from a sheet of soft board consists of two parts, the mounting board and the support stand. The dimensions of the copying stand are provided in figure 16. The parts are not fixed together, allowing for various sizes of mounting boards, thereby providing for greater flexibility of the stand. The stand not only provides for the copying of originals on individual papers but originals in books and magazines. The support stand holds the mounting board in place and provides a support for a book, magazine or other large original that requires a firm base to stand upon. The larger originals are held in place by screw mounts or clamps. In the case of a book, the clamps hold



copy stand and camera

FIGURE 15

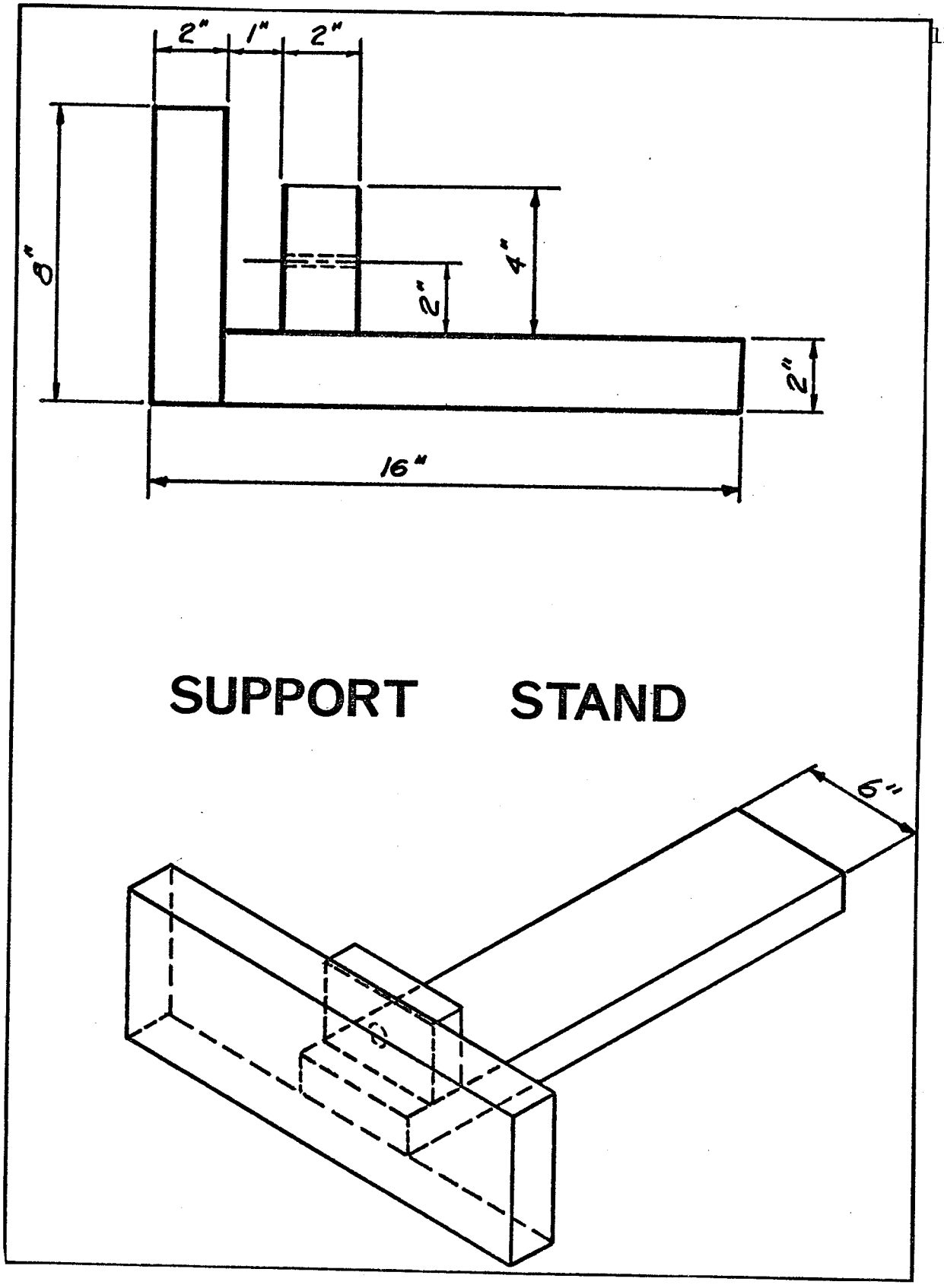


FIGURE 16

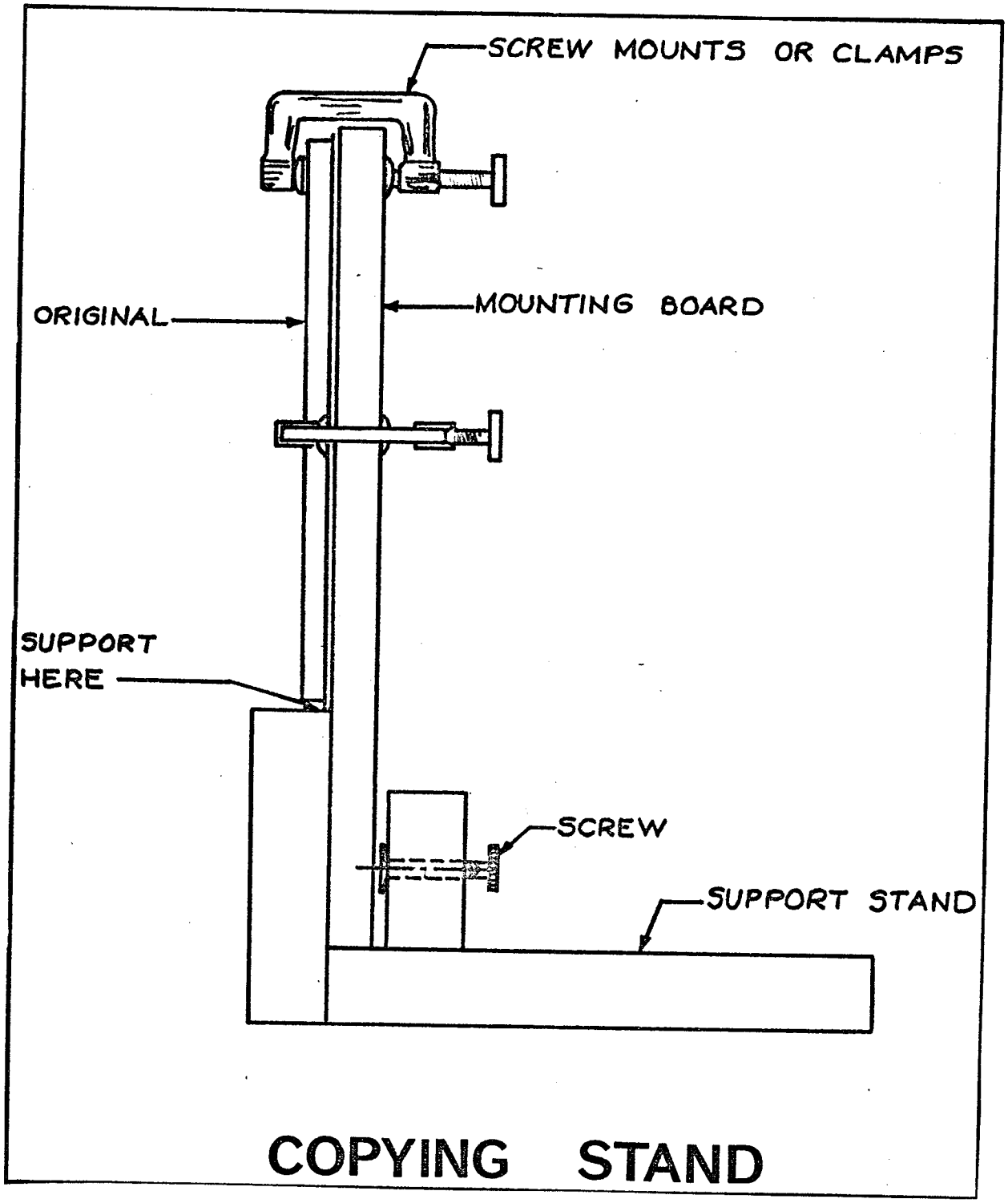
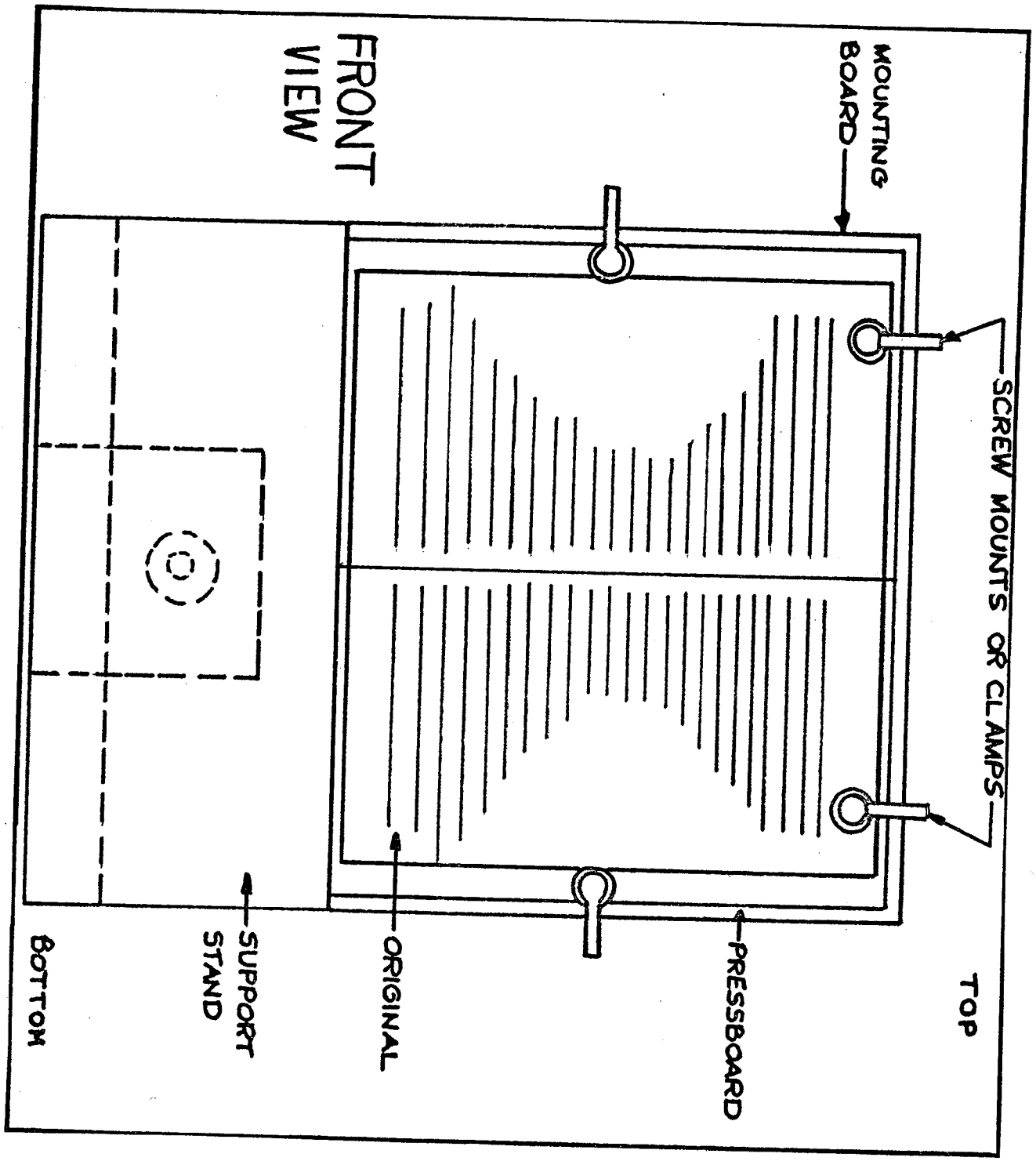

SCREW MOUNTS OR CLAMPS
ORIGINAL
MOUNTING BOARD
SUPPORT HERE
SCREW
SUPPORT STAND
COPYING STAND

FIGURE 17



copy board

FIGURE 18

the book open and flat. Originals as individual papers are held in place with push pins, although this creates small pin holes in the edges of the original. If this is not desirable the clamps can be used. The clamps may cover parts of the original to be photographed, so another alternative is to use double-sided adhesive tape.

The mounting boards were constructed in two sizes, 12"x12"x1" and 24"x24"x1". The choice of the size of the mounting board is made on the original size. The original must be smaller than the board to be securely attached, completely flat and free from curling. This is necessary so that all areas of the original are equal distance from the camera and are in focus.

The surface of the mounting board is painted black. It must not be painted white or a light color as the area of the board not covered by the original will reflect light into the camera lens resulting in the lens apperature setting to be incorrect. Consequently the reproduction will be underexposed. The center of each copyboard was located and marked. A series of rectangles were drawn on the boards, 4"x5", 5"x7", 8"x10" and an additional 11"x14" on the larger copyboard. These rectangles correspond to standard paper sizes. The size guides center the original on the copyboard. Therefore the image of the original will be centered on the film.

Copying Technique

The selection of the correct film depending upon the original type and light source is the most important step of the procedure. The originals must be organized into the two types prior to copying and must be

sequenced from large to small. Otherwise, extensive lens changes and lens-to-subject distance changes will be required continually throughout the process of copying a great number of originals.

The light sources utilized are either natural light, ordinary tungsten light or tungsten photolamps. The film selected must be color balanced to the light source if the reproduction is being done by color film. At no time is a flash, either electronic or reflector, used since there are problems of unanticipated reflection and increased exposure requirements.

The camera is mounted on a tripod with the height of the camera determined by the center of the lens being on the same plane as the center of the copyboard. For the photographer's convenience, the copyboard is placed on a table or some other object to give height. The lens to subject distance and the use of supplementary lenses depends upon film speed, the position and amount of light, the lens aperture, exposure time and original type. For line originals, with light, aperture and time remaining constant, no compensation of exposure will be required for various originals. For continuous tone originals, compensation will have to be made since very dark originals require more exposure and very light originals require less exposure. This is because dark colors absorb more light than light colors and correspondingly light colors reflect more light than dark colors. The amount of exposure compensation will depend upon each individual original.

For line originals which have no toning between the lines and the background, a film sensitive to high contrast is used to reproduce the

high definition of lines. The film must have extremely fine graininess, very high resolving power and edge of line sharpness. The films suggested for original types and the following table are recommended on the basis of results determined from the film used in the construction of the seven slide series prepared for the study.

TABLE VIII

SUGGESTED FILM TYPES FOR CONTINUOUS TONE AND LINE ORIGINALS

CONTINUOUS TONE	LINE
Kodachrome-X	Kodachrome II
Ektachrome-X	Kodachrome II Professional Type A film
High Speed Ektachrome	Panatomic
High Speed Ektachrome (tungsten)	
5254 film	

Summary of Procedure

1. Film is selected based upon original type and color requirements whether reproduction is to be in black and white or color.
2. Prepare camera on tripod, camera is equipped with a cable release to prevent any movement of the camera when the shutter is released.
3. Original is placed on copying stand, guaranteeing that the light source creates no reflection from the original and original is completely flat.

4. Light source whether daylight, room tungsten or tungsten photo lamp light as determined by film choice must illuminate the original evenly and must be placed behind the camera. The photo lamps can be hand held, but preferably should be mounted on a tripod or suspended to guarantee even distribution of light. If daylight is used, the tripod and copying stand should be placed in front of a window, or set up out-of-doors. Precaution must be taken that the light source comes from above the camera-copy-stand plane so that no shadows are cast upon the original.
5. The camera lens is focused on the original. The need for various close-up lenses and the lens to subject distance will depend on the field size of the original.
6. The light or exposure reading is made and the camera is adjusted accordingly after the lens is focused.
7. The shutter is released.

Slide-analysis: Technical Quality

The quality of the finished reproduction can be evaluated on the technical qualities by completing the following table for all slides or for the purpose of film type comparison to be compiled for future reference to determine film choice.

TABLE IX

SLIDE ANALYSIS: TECHNICAL QUALITY
SLIDE - CONTENT _____
FILM USED - _____ ASA
F-STOP - _____
SHUTTER SPEED - _____
LENS - _____

CRITERIA	Rating on a scale of five where 5 is a rating of excellence and 1 a rating of minimum acceptability
Definition: -graininess	1-2-3-4-5
-resolving power	1-2-3-4-5
-sharpness	1-2-3-4-5
Color Balance	1-2-3-4-5
Framing of subject	1-2-3-4-5
Perspective	1-2-3-4-5
Exposure	1-2-3-4-5

Adaption to Filmstrips

The arguments for either the choice of slides or filmstrips are many. Filmstrips are very compact and easily stored. Slides stored without trays involve the inconveniences of loading and unloading before and after presentation and slides stored in storage trays require much space. A slide series has the advantage in that changes can be made in the visual sequence with little effort while a filmstrip is in a permanent ordering. A few slides can be chosen for viewing while select viewing of individual filmstrip frames may require distracting flipping over frames to display the ones desired.

Filmstrip projectors are less expensive than slide projectors and with the proper adaptor, can perform the dual function of projecting filmstrips as well as slides. Slide projectors have a singular purpose--to project slides although some projectors can project glass slides as well as the celluloid slides.

Film strips lend themselves more readily to individual viewing than do slides. Individual filmstrip projectors can be obtained at minimal cost and are easily operated by students of all ages.

5254 Kodak film can be processed as slides or as filmstrips. The filmstrips developed are full-frame in size and are not half-frame strips. The individual frame will be the same size as a finished slide. Essentially all films can be processed as a filmstrip if it is specified that the developed roll of film not be cut and not made into individual slides. For half-frame filmstrips where two frames are the size of one, a special camera and lens system is required.

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS

Introduction

The study has established a procedural method for slide production and selection for the purpose of achieving learning objectives. The procedure was necessitated by the lack of research and the inadequacies of existing studies on conceptual development through the use of visuals. Conceptualizing begins with the perceiving of the concrete referent. One method of providing perceptual experiences for the learner is through visuals. Recent Social Studies curricular projects indicate that the trend is for conceptual development with concepts providing the organizing structure of the curriculum. Student needs are of utmost necessity and these needs must be reflected in the learning goals. The procedure is designed to provide perceptual experiences as determined by specific learning objectives. The procedural method provides a learning experience for the student, and is not an analysis of a teaching strategy for the teacher. The procedure is operationalized through seven slide series. The slides in the study provide an example of the translation of the theory of the method into practice.

Conclusions Related to Procedure and Completed Slide Series

The procedure is based upon four factors which determine the selection of the slide visuals. These elements are in existence prior to the operationalizing of the procedure. The student's previous learning experiences and existing cognitive structure determine the

selection of the learning processes and the selection of content, reflected in the learning goals. The junior high history course of study guide is a limitation to content choice. The sequencing of the content depends upon the concepts selected as the organizers to the structure and the learning processes utilized.

The procedure is circular in that the student's achievement of the learning goals will build upon the student's cognitive structure. The slides are the variables and the learning goals will only be achieved if the pictures and slides provide the student with the necessary perceptual experiences. This variable must be evaluated during classroom application of the operationalized procedure, where goal attainment is evaluated on the assumption that the other factors in the procedure are constant at the time of application.

To determine the reliability and validity of the procedure in slide selection, the same set of learning goals must be analyzed by two or more persons independently in the same environment. The procedure must be operationalized for a specific environment with the resulting media prescriptions evaluated. Each environment must be prescribed and the visuals selected. The visuals in the slide series in the study can not be evaluated in any other environment than the one for which they were specifically designed.

The completed slide series are not created to exist in isolation, nor to provide a total learning experience for the development of a concept. They are an integral part of the teaching-learning process and are to be incorporated into a unit of studies. The slide visuals

have a greater function than simply introducing or concluding a unit. Their purpose is for conceptual development, and not for the presentation of visual data.

Implications for Education

The procedure is designed for the adaptation of a visual slide series to meet the needs of the individual. The procedure has special meaning for the development of visual resources for the special problems in education such as the retarded, the culturally different, the superior or slow student, the vocational and the academic student. Teachers must analyze and prescribe for needs of their students. The procedure will be based upon each student's cognitive structure; learning experiences and the learning processes will reflect the individual's ability.

The procedure is independent of content. The content is selected for the development of the concepts selected. The concepts in the Social Sciences are universal in their application and development in the grades VII-XII Social Studies curricula for Manitoba schools. Consequently the procedure can be applied to all secondary grade levels of the Social Studies, including social science disciplines other than history. As well many of the basic specific concepts are being developed at the elementary level, therefore making the procedure applicable to all Social Studies curricula at all grade levels. In this way, a learning situation is created where transfer of learning occurs throughout the grades. When this transfer is recognized by the student, the student will realize the existence of a structuring of learning experiences. The development

and application of the concepts through the three selected grade levels, makes obvious the existence of this structure in the social studies. At present too many of the courses exist as isolated and independent entities, resulting in basic social science concepts not being developed or undue repetition of content materials.

The learning experiences provided for the students by the visuals are structured by the teacher. As previously stated the concepts are developed and applied through three grade level learning experiences, encouraging the transfer of learning through the grades. According to the accepted learning theory, with the existence of structure and transfer of learning, student learning effectiveness will increase since learning becomes meaningful.

The use of the procedural method by the teacher for classroom application has major implications to the role of the teacher. The teacher is involved in curricular construction at a basic planning level in the designing of the resources. Establishing learning goals or objectives is a prerequisite to planning curricular units and projects, and experience in this area of materials construction is indispensible to more complex and lengthy planning. Planning of this nature requires more professional training by the teacher and a secure knowledge of the Social Science disciplines.

The role of the teacher in the procedural method for slide construction is one of structuring an environment to evoke the kind

of student behavior desired. The emphasis is on learning and the learner, not on the teacher as the lecturer and information source. With the obvious structuring of the learning environment, the teacher is aware of the type of behavior desired from the student and is aware when the simple acquisition of knowledge is the only goal. The method encourages the use of inquiry and critical thinking skills utilizing the most complex thought processes.

Suggestions to further Study

1. To evaluate the effectiveness of the use of slide visuals selected for the achievement of specific learning goals, experimental situations will have to be constructed. The learning goals in each contrived situation must be consistent and the teaching strategies utilized be the variables. Suggested teaching strategies would be the lecture-question-answer situation and the seminar method, both structured verbal approaches to education.
2. Further study is necessary to corroborate the implication drawn that the procedure can be applied to other Social Science disciplines, such as geography, sociology, anthropology and political science. This research would assume the nature of a study on one element of the procedure--the content.
3. The above research method would lend itself to a study of the procedural method in application to disciplines other

than Social Science. Specifically, the method must be applied to the natural sciences and the humanities. The study is designed for the purpose of conceptual development and application. Concepts are universal to all fields of education. Concepts are being developed, regardless of discipline orientation, in the elementary grades. The procedure must be applicable to conceptual development in all areas of education and by all learners in all grade levels.

4. A second element of the procedure necessitating research is the student, the individual. Experimentation must support the contention that the procedure meets the needs of all students, not simply the academic student. The procedure must be utilized in the special areas of education, especially the culturally different, such as in Indian and Métis education, a problem of specific concern in Manitoba.

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APPENDIX

APPENDIX A

Sources for the Visuals

The sources for the visuals used in the slide series are of two types:

1. On-location visuals of the actual referent or simulations or models of the actual referent.
2. Reproduced visuals of the referent, model or simulation. This includes close-up pictures taken from books, magazines, posters etc.

The actual sources of the slides will be listed in this section. The listing will be divided into three sections:

A. A list of on-location sources other than museums and galleries.

B. A list of all museums and galleries.

C. A list of materials used for reproduction from close-up photography techniques.

The purpose of providing the lists of sources is to provide suggestive hints for direction in finding and locating source materials.

A. On-location Sources

St. Pauls Cathedral, London
Tower of London, London
Westminister Abbey, London
Amphitheatre, Verona
Stratford-on-Avon, England
Winchester Cathedral
Salisbury Cathedral, England
Old Sarum, Salisbury, England
Stonehenge, Salisbury, England
Pompeii, Italy
Rome, Italy
Coventry Cathedral, England
Wasa Museum, Stockholm, Sweden
Versailles, France
Mets Cathedral, France
Fountains Abbey, Yorkshire, England
York, England
Segovia, Spain
Snowdonia, Wales
Winnipeg, Manitoba
St. Peters, Rome

B. Museums and Galleries

The Armouries, Tower of London, London, England
Castle Museum, York, England
Yorkshire Museum, York, England
British Museum, London, England
Victoria and Albert Museum, London, England
The Louvre, Paris, France
The Archeological Museum, Venice, Italy
Uffizi Gallery, Florence, Italy
Archeological Museum, Florence, Italy
Gallery of the Academy, Florence, Italy
Palatine Gallery, Florence, Italy
The Armouries, Edinburgh Castle, Scotland
London Museum, London, England
Madame Tussaud's London, England
National Maritime Museum, Greenwich, England
Palatine Gallery, Pitti Palace, Florence, Italy
Medici Palace, Florence, Italy
Viking Ship Museum, Oslo, Norway
National Maritime Museum, Greenwich, England

C. Reproduction Sources

1. Life Magazine, New York.

2. Life Educational Reprints, New York.

3. Pictoral Education, London, England.

4. National Geographic Magazine.

5. Time Magazine.

6. Newsweek Magazine.

7. Van Phillips and Owen Thomas, The Travellers Book of Colour Photography, Hamlyn Publishing, 1966.

8. H. W. Janson, History of Art, Englewood Cliffs, 1962.

9. Alfred Cobban (ed.), The Eighteenth Century Europe in the Age of Enlightenment, McGraw-Hill, 1969.

10. Purnell for BPC Pub. Ltd., London, History of the English Speaking Peoples.

11. Frederich Heer, The Medieval World, Mentor Books.

12. Robert C. Pooley, The England of Literature, Gage Educational Publishing Limited, 1953.

13. Joanna Matturri and Hy Dales, Inner City Reflections in Black and White, Pocket Books, 1973.

14. Kenneth Clark, Civilisation, British Broadcasting Corp., 1969.

15. Anthony Burgess, Shakespeare, Clark, Irwin, 1970.

16. National Geographic Books: Greece and Rome
: The Renaissance

APPENDIX B

Camera Techniques and Technical Considerations

Flavelle has prepared a book, Photography; A Craft and a Creed,[1] which gives basic non-technical photography techniques. It is geared for the novice photographer, introducing the basic elements of the camera to suggestions concerning picture composition and picture contrast. Sixty-six illustrative plates provide the reader with concrete examples of the methods and problems of photography.

La Cour and Lathrop in their book Photo Technology[2] build upon Flavelle's book and enter into the technical aspects of photography and photographic techniques. Film, film processing, camera handling, camera types, light principles, exposure and composition are examined as well as the basics--taking good pictures.

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[1]Elleworth Flavelle, Photography; A Craft and a Creed, Toronto: Focus and Mann Press, 1958.

[2]Marshall LaCour and Irvin T. Lathrop, Photo Technology, Chicago: American Technical Society, 1966.

Kodak has prepared many books and articles on camera and film techniques. How Does A Picture Mean?[3] stresses to a certain degree 'writing visually' but does discuss and explain the basic elements of photography with a special section on the creation of picture sentences. The Kodak Master Photoguide for still picture taking[4] provides a comprehensive guide to the specifics in photography with topics ranging from exposure, stop-action pictures, films, flash, filters, depth of field, close-up photography and lens systems. Kodak Films for the Amateur Color and Black and White[5] provides all answers on film and film use in all light sources that the amateur photographer could ask.

The Visual Instruction Bureau, University of Texas, has prepared a series of eleven pamphlets titled "Bridges for Ideas" which give teachers assistance in developing materials for various media. Special emphasis is on the pamphlet, Production of 2x2 Inch Slides for School Use: Local Production Techniques. Descriptive brochures regarding the series can be obtained by writing to:

Instructional Media Center
The University of Texas
P.O. Drawer W
University Station
Austin
Texas, U.S.A.

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[3] Kodak Educational Aid, How Does a Picture Mean?, Rochester, New York: Eastman Kodak Company, 1968.

[4] Eastman Kodak Company, Kodak Master Photoguide for still picture taking, 1968.

[5] Eastman Kodak Company, Kodak Films for the Amateur, Rochester, New York: Consumer Markets Division, 1971.

APPENDIX C

SEVEN SLIDE SERIES ARE AVAILABLE FOR CONSULTATION

AT THE EDUCATIONN LIBRARY, FACULTY OF EDUCATION,

UNIVERSITY OF MANITOBA

OR

HEAD OF DEPARTMENT: CURRICULUM: HUMANITIES AND SOCIAL

SCIENCES, FACULTY OF EDUCATION, UNIVERSITY OF MANITOBA.

APPENDIX C

Representative Slide Series

Included in the study are the slides from the slide series The Absolute and the Peasant. Due to problems in binding all the slide pages for the seven slide series into the thesis, it was decided to incorporate only one series. The remaining six slide series are available upon request from the Education Library, Faculty of Education, University of Manitoba or from the Head of Department: Curriculum: Humanities and Social Sciences, Faculty of Education, University of Manitoba.