VISUAL EDUCATION

A COMPARATIVE STUDY OF MOTION PICTURES *and* OTHER METHODS OF INSTRUCTION

THE REPORT OF AN INVESTIGATION MADE WITH THE AID OF A GRANT FROM THE COMMONWEALTH FUND

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PREFACE

On April 1, 1922, the educational committee of the Commonwealth Fund granted to the University of Chicago the sum of $10,000, to be used, under the direction of the writer, to support a study of educational motion pictures. The experiments which are reported in the following pages were made by means of this grant, during the succeeding year. They were carried on in the University of Chicago Elementary School and in the public schools of Evanston, Illinois; Urbana, Illinois; Detroit, Michigan; Cleveland, Ohio; Joliet, Illinois; and Chicago, Illinois. The authors of the several reports and the editor have joint responsibility, both for the experiments and for the reports.

It would be difficult, if not impossible, to acknowledge all of the assistance which has been generously given in the conduct of these experiments. It is hoped that the many who are not mentioned by name will accept this general acknowledgment. Special mention should be made of the following: Mr. D. E. Walker, Assistant Superintendent, Evanston; Mr. William Harris, Superintendent, Urbana; Professor A. B. Mays, University of Illinois; Professor W. M. Gregory, Cleveland School of Education; Mr. Dudley Grant Hays, Assistant Superintendent, Chicago; Miss Wiley, principal of Leal School, Urbana; Mr. B. A. Barns, principal of Angell School, Detroit; Miss Anne Dubelin, assistant principal, North Doan School, and Miss Ethel Dauss, teacher in Mt. Auburn School, Cleveland; the following teachers in Detroit: Miss Lillian Norconk, Doty, Miss Virginia West, Lingemann, Miss Catherine H. King, Columbian, Miss Kennedy, Condon, and Mr. McGuire, Miss Robinson, and Miss Lodge, Miller Intermediate. The investigation was also materially aided by the loan of motion picture films by the Society for Visual Education and the United Projector and

Film Co., and by the gift of stereographs and slides by the Keystone View Co.

On account of the varied character of the experiments, and the large number of persons who conducted them, it appeared impossible to present a single report organized by topics, unless it should be written by one person. It was thought undesirable to thus sacrifice individual responsibility. The reports are therefore presented separately, but an organized summary of all of them is printed at the beginning.

F. N. F.

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PART I

GENERAL SUMMARY OF THE STUDY

CHAPTER I

INTRODUCTION: PROBLEM AND METHOD OF PROCEDURE

The first few years of the present century may be taken as marking roughly a turning-point in the mode in which changes are brought about in American Education. The feature of the new era which sets it off from those which precede it is the application of scientific methods to the investigation of educational problems. Before 1900 new subjects of study, new forms of organization, and new methods of teaching were introduced on the ground of opinion. They were opposed also on the same ground. Now proposed innovations, and established practices as well, must meet the challenge of the science of educational measurement, which stands ready to appraise them, not on the ground of opinion, but on the ground of objectively ascertained fact.

We need not review here the difficulties which attach to such scientific measurement nor the sources of error which thrust themselves upon our attention. The scientific student is painfully aware of these difficulties and sources of error, since it is his business to overcome them. Nor need we dwell upon the necessity of resorting to opinion—based upon careful observation and a recognition of general psychological truths—to supplement our as yet confessedly incomplete scientific studies. Granted all this, the real hope for consistent progress in education lies in the application to it of careful, painstaking methods of research.

The need of scientific scrutiny of the group of new methods or devices which go by the name of visual education is apparent on every hand. Visual education is relatively expensive, particularly in the form of motion pictures. At this time when school systems throughout the land are in dire financial straits, new and expensive devices must be examined with care. Extreme

and apparently extravagant claims are made for visual education. We are told that it will in whole or in part displace the teacher or the textbook, that it will speed up education tenfold, that it will make education absorbingly interesting and thoroughly permanent. Visual education is promoted by advertising campaigns which set forth the most grotesque arguments for the adoption, such as: "What goes in one ear goes out the other, but what goes in through the eye sticks, as there is no hole in the back of the head." If this is intended as humor, it at least indicates the level of appeal which its author believes is suited to the average school official.

The present investigation was undertaken in the belief that school administrators have sufficient confidence in scientific methods to be hospitable to a serious attempt to weigh the educational possibilities of visual education. The authors of this report disclaim any pretension of having finally and completely determined what these possibilities are. They do believe, however, that the experiments which they have made help to determine how fast the schools ought to go in adopting the present forms of visual education and in what direction the development of visual education should proceed.

WHAT IS VISUAL EDUCATION?

There is something strange and unusual about visual education. Visual education represents a grouping of educational materials or devices and an organized department of instruction which is based, not upon subject-matter, but upon a method of presentation. This method has as its essential feature the fact that it belongs to one of the senses. Such a situation is without parallel. We do not have departments of auditory education, of tactual, kinesthetic, gustatory, or olfactory education. What is the cause of this unique position of visual education and of what does visual education consist?

We may get at the fundamental cause of the unusual situation in which visual education finds itself by glancing at its history. Visual education, in the broad sense of the term, is, of course,

not new. Models, maps, diagrams, pictures, all have been used for generations. Teachers of the various school subjects have developed materials and forms of visual presentation to be used in teaching their subjects. Geography and nature study have been represented by an abundance of such materials. There is now a strong movement toward the centralization of these materials and with this centralization has gone the agitation for the enlargement of its scope.

A number of conditions have combined to produce centralization. One is the development of elaborate museums in place of the small collections of models in individual school buildings. An example of such museums is the Field Museum of Chicago with the Harris Extension which provides distribution of specially prepared specimens to the public schools. A second condition favoring the centralization of visual education is the development of the extension service of the state universities. This service has emphasized agricultural education, but has also included general public education. A third factor is the organization of large companies which manufacture for use in the school the material equipment for visual education. This equipment may consist of models, charts, maps, projection apparatus, or material to be projected. The materials which have been most important in their influence on the development of visual education as a distinct agency in the school are stereopticons and slides, stereoscopes and stereographs, and last but not least motion picture projectors and motion picture films.

It is clear from this account that the centralization of visual education has arisen because of the exigencies of the production and distribution of materials rather than from the inherent unity of the field of visual education itself. Visual education, in fact, is extremely variegated in its subject-matter, its aims, and its materials and paraphernalia. A complete study of visual education, therefore, would lead us into the details of the teaching of all the subjects of the school. If we confine ourselves to the processes which go officially under the name of visual education and which are commonly administered by a centralized

agency, the complexity of our task is great enough. We shall then include as our chief subjects of study the three outstanding modes of pictorial representation, namely, slides, stereographs, and motion pictures. These, accordingly, are the chief subjects of our study, with the emphasis on motion pictures, on account of their newness and because their development is most susceptible to the influence of experiment.

GENERAL SCOPE OR RANGE OF THIS STUDY

In undertaking an investigation in any field in which comparatively little work has been done, one is faced with two alternatives. The first is to make a rather broad comprehensive survey of the entire field. The second is to make a more intensive study of certain narrow problems within the field. Each of these procedures has its advantages and its disadvantages. The broad general survey has the advantage of raising a variety of problems, of pointing the way to more specialized studies of these problems, and of contributing something to the solution of some of these specialized or narrow questions. The disadvantage is that many of the questions which are raised are left at loose ends, and no one problem is carried sufficiently far to reach a final solution. The advantage of the specialized investigation is that it does solve certain problems, but the attending disadvantage is that these problems are very narrow in scope.

In planning the present investigation the advantages of the broader type of study seemed to be sufficient to turn the scale in favor of this type. Consequently the study deals with a variety of examples of visual education and with a variety of questions concerning these examples. The nature of the experiments can best be grasped from a brief statement regarding the comparisons with which they are concerned.

TYPES OF COMPARISONS MADE IN THE STUDY

The investigation consists largely in a comparison between various forms of visual education or between visual and non-visual methods. We may first consider the types of presentation

which were compared with one another in the various experiments of the study. In the first group of comparisons, the material in the exercises which were compared was duplicated as exactly as possible. For example, if a motion picture film was to be compared with lantern slides to determine which was the more effective, the lantern slides were constructed so as to duplicate the pictures which were shown in the film. In a number of cases the lantern slides were actually made from selected frames in the film. This general procedure was followed out in all of the comparisons of this group.

One of these comparisons has already been mentioned. A motion picture film was shown to a group of children, and to another group was shown a number of lantern slides, duplicating sections of the film. In some cases accompanying verbal description which occurred in the subtitles of the film was presented orally to the class. In other cases the subtitles as well as the pictures were reproduced upon the slides. In these cases the slides containing the subtitles alternated with the slides containing the pictures, as in the film. Another arrangement which it would be well to make, but which was not made in this study, is to have the subtitles shown simultaneously with the pictures.

One of the problems frequently raised concerning the presentation of motion pictures is whether the instructor should talk with the film. In order to throw light upon this problem, films have been exhibited with and without the accompaniment of oral discussion.

Other comparisons have been made as follows: A class was shown both the film and a collection of slides made from the film. To another group the film was shown twice. Again the motion picture projected twice was paralleled with a lengthened presentation of slides or with a prolonged oral discussion with or without charts or pictures. In other comparisons pictures or charts were used in place of slides. These pictures were taken directly from the films and were shown with accompanying oral discussion. In still other cases the pictures were placed upon small prints and shown in connection with printed or mimeo-

graphed verbal discussion. This was to compare with the motion picture film material which is organized in the fashion of textbook. In a few cases oral discussion was compared with the film without any accompanying pictures or charts.

For certain types of material, demonstration by the teacher was the form of presentation to be compared with the film or the slide. The study of demonstration as a form of presentation was applied to the teaching of manual arts, and of laboratory science. In teaching position in handwriting, the effectiveness of a motion picture was compared with knowledge on the part of the pupils of their individual scores and with the ordinary mode of instruction.

In all these cases, as has already been said, the modes of presentation which were compared contain materials which are closely similar. In another group of cases the material used in the parallel modes of presentation was not duplicated so closely. In an experiment in the field of health education the division was made in this fashion: One group of pupils was given instruction by a great variety of methods. These methods included pictorial representation by motion pictures and by still pictures, projects, and oral instruction. In the parallel group all of these methods were used except the motion pictures, and for these was substituted oral instruction in the form of reviews.

The foregoing brief survey will serve to illustrate something of the variety of methods of presentation that were studied. It will also indicate that considerable care was taken to avoid the invalidation of the results from differences in the content of the subject-matter rather than in the form in which it was presented.

The comparisons already alluded to deal with entire films. The purpose in general was to determine whether the film as a whole gives better results than some other method of presentation as a whole. It is possible, to be sure, by such a method to analyze to some extent the effectiveness of the methods which are compared by classifying the scores which the pupils make in the different parts of the tests. Such an analysis was also made in a somewhat more definite fashion by breaking the film itself up

and by comparing certain parts of the film with other modes of presenting these individual parts. This was done by cutting out of the film certain parts and presenting them in some other way, while the rest of the film was left intact. For example, a particular film included considerable tabular material in subtitles. This tabular material was shown upon charts or was mimeographed and read individually by the pupils. In the same film there were a number of charts made up of line drawings. These charts again were shown by themselves and the rest of the film was shown in its original form. This type of analytical comparison should undoubtedly be carried much farther in order not merely to determine whether a film is good as a whole, but what parts are good and what parts are poor. It is true, one must avoid disrupting the unity of a film, but in certain cases the experiment can be made without serious difficulty on this score.

Another type of comparison which was represented to a slight extent in the study, consists of a comparison of the effectiveness of a film as a means of introducing a subject, or as a means of summarizing it. There is a very large field of study in problems of this character which are concerned not so much with the value of the film as with the best manner of using the film. The continuation of the study of this type of problem will undoubtedly be very productive in pointing the way to the administrative use of motion pictures in the school.

THE CHARACTER AND SELECTION OF THE FILMS

The types of experiments may further be illustrated by indicating the classes of films which were used. The question has rightly been raised whether the films represented the truly educational motion pictures. So far as it was possible to do so, films were selected which represented the best types of educational motion pictures. In practically all cases they had been made specifically for educational use and were not films which were first intended for use in the theater and then taken over for use in the school. Of the educational films themselves, a considerable

variety of types were employed. They included the subjects of geography, nature study or biology, public hygiene, health education, physics, cooking, history, economics, handwork, and handwriting. Probably the chief omission is the dramatic film. A tentative study is now being made of the effect of dramatic films also, but the bulk of the investigation has dealt with what have been called "text films" or "school films." The study, in other words, has dealt chiefly with films which are designed to give information or to teach how to perform an activity. This is not because of the belief that dramatic films are not educational or do not have a legitimate place in the school, but chiefly because the methods of investigation of the results of such films have scarcely developed to a point which makes an immediately productive study of them possible.

The problem of the selection of the films has already been mentioned. It goes without saying that one could not draw very definite conclusions regarding the value of a particular type of film from an experiment with only one representative of that type. No one would judge the value of textbooks or of the laboratory method from an examination of a single textbook, or a single laboratory exercise. This fact, of course, has been kept very clearly in mind by the authors of the present study.

There are two ways in which this difficulty may be in part overcome. The first is by as careful a selection of films as possible. In general the attempt was made in this study to select definitely superior films. It might have been possible, of course, to select decidedly poor films, and in this way to load the investigation. Another and perhaps a legitimate procedure, would have been to attempt to select average films. In view of the fact, however, that visual education, as represented by motion pictures, is new, it is legitimate to assume that the grade of pictures will rapidly improve, and that therefore those pictures which are at the present time the best may shortly represent the average.

It would, of course, be too much to expect that the selection of pictures should meet with universal agreement. This is

unavoidable. All that the authors of the report claim is that they made an honest effort to select films which would represent the best of their kind.

The second method of overcoming this difficulty is to take refuge in numbers. If an unfortunate selection is made of a particular film, the error will be counterbalanced by other films which are exceptionally good. If a considerable number of films are used, therefore, as was the case in this investigation, it is hardly likely that the results are greatly vitiated by the character of the particular films which were chosen. However, the number of films which have been experimented with is still limited, and it is desirable that many more be subjected to these and other types of experimentation.

SUBJECTS OF THE STUDY

The general method of making the comparison of the effectiveness of different forms of presentation or of different elements in a film was the method of parallel groups. This seems to be the only method which is available, since one could not present the same subject to a group of children first by one mode of presentation and then by another. In this case a second presentation would not be comparable to the first.

Two general forms of parallel grouping were used. The one which was employed in the greater number of cases involved the careful matching of the individuals of limited groups. This matching was done on the basis of such characteristics as age, grade, score in an intelligence test, score in a reading test, and score in a preliminary test in the subject under examination. Not all of the latter three criteria were used in any particular case. The organization of parallel groups in this manner insures that the error which might result from a wide divergence in the abilities of the children is at least reduced to a comparatively small amount.

The second method of organizing parallel groups was to take groups which were so large that individual differences could be assumed to counterbalance each other. This, of course, could not

be assumed unless the groups were similar in such general characteristics as age, race, social environment, and type of education. In all cases they were chosen so as to be similar in these respects. The children who were used as subjects in this investigation were nearly all public-school pupils. Most of them were situated in the intermediate or upper grades, but a few were in the high school. The schools were situated in a number of cities, so that a variety of communities were represented. The cities in which experiments were made include Evanston, Urbana, Detroit, Cleveland, Oak Park, Joliet, and Chicago.

TESTS OF RESULTS

The selection of appropriate tests is of course an important consideration in any such investigation as this. It is particularly important in the case of visual education, since it may be that the results of this method of instruction are of different character from the results of the oral lecture or textbook. It has been thought that the tests which have been devised to measure the results of teaching of the ordinary sort are not well adapted to measure the results of visual education. This has been recognized as a problem in the organization of our experiments. We have attempted so far as possible to use tests which should measure the educational outcome which it was evidently the purpose to secure.

The question has sometimes been raised in regard to these tests whether or not they measured the interest which is awakened in children by viewing motion pictures as compared with the interest they take in other modes of presentation. Various methods of measuring interest directly might be used, but none of them seem highly satisfactory. The questionnaire method is the prevailing one, but this is recognized generally as being not very reliable. It is undoubtedly true, however, that interest can be measured in a fairly satisfactory way indirectly. Even an information test is to some degree a measure of interest, because the pupil will derive more information from a subject in which he is interested or from a lesson which is presented in