

CURRICULUM ADAPTATIONS AND TEACHING PROCEDURES IN ARITHMETIC
FOR SLOW-LEARNING SIXTH-GRADE CHILDREN
IN MONTANA

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Submitted in partial fulfillment of the requirements
for the Master of Education degree
Montana State University
August, 1967

WAB:BN
P378
N487
sep 2

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Statement of the Problem	2
Procedures	3
Limitations	4
Definition of Terms Used	4
II. REVIEW OF LITERATURE	5
Characteristic Skills and Traits of the Slow Learner	5
Curriculum for the Slow Learner	15
III. CURRICULUM ADAPTATIONS AND TEACHING PROCEDURES PROVIDED FOR SLOW LEARNERS IN MONTANA SCHOOLS	20
Summary	27
IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS . .	28
Summary	28
Conclusions	29
Recommendations	30
BIBLIOGRAPHY	32
APPENDIX	36
Appendix A: Outline of an Arithmetic Program for Slow-Learning Children in the Sixth Grade	37
Appendix B: Letter Sent to Elementary Principals in Montana	39
Appendix C: Survey Letter Sent to Elementary Principals in Montana	41

LIST OF TABLES

TABLE	PAGE
1. Number and per cent of respondents using each teaching method relative to material within the ability of the group	23
2. Number and per cent of respondents using each teaching method relative to the use of fundamental skills	24
3. Number and per cent of respondents using each teaching method relative to the use of mathematics in social situations	26

ABSTRACT

CURRICULUM ADAPTATIONS AND TEACHING PROCEDURES IN ARITHMETIC FOR SLOW-LEARNING SIXTH-GRADE CHILDREN IN MONTANA

STATEMENT OF THE PROBLEM: The purpose of this study was to determine what curriculum adaptations and teaching procedures used in Montana schools were appropriate for teaching the slow learner.

PROCEDURES: The data for this study was obtained through the review of literature and a survey letter sent to sixth grade teachers in those schools having fifty or more teachers in the elementary system.

SUMMARY: The review of literature stressed the fact that the slow-learning pupil learns in the same way, fundamentally, that other pupils learn, but methods of instruction must be adapted to the skills and traits of the slow learners. Most authorities agreed that the fundamental problem related to school experiences for the slow learners was in the area of curriculum development and that a meaningful curriculum must be devised, adapted or modified if it is to meet the educational needs of the slow learners. The results of the survey letter would seem to indicate that most of the educational needs of the slow learners are largely dependent on the classroom organization and teaching procedures of the individual teachers.

CONCLUSIONS: Those concerned with the education of the slow learner must take into consideration the characteristic skills and traits of the slow learner if they are to effectively provide a meaningful educational experience. The curriculum should differ both in basic content and in emphasis from that provided normal children, and it must be developed with reference to the characteristics, experiences, potential, and environmental backgrounds of the slow learners. The results of the survey letter seem to indicate that more needs to be done by teachers in Montana schools to provide for the individual differences of slow-learning children commensurate with their characteristic skills and abilities.

RECOMMENDATIONS: Teachers of slow-learning children should avail themselves of the latest research findings in meeting the pupils' individual needs. There also needs to be a greater awareness by teachers of slow learners' characteristic traits and skills, and provision made for these traits in the arithmetic program.

CHAPTER I

INTRODUCTION

Authorities, in general, have become aware of the apparent need for improvement of the educational programs for the slow learners. One such statement as expressed by Karnes was, "While every effort is now being directed toward improving the educational programs for the mentally handicapped, the average, intellectually superior, and gifted children, there is an unfortunate neglect of the slow learners, who constitute about 20 per cent of our total school population."¹

Featherstone made the following comments concerning the education of slow-learning pupils in our schools:

In every sample of one hundred pupils selected at random from the elementary schools of the nation, there are at least twenty who must be regarded as slow learners. They are the ones who are left behind year after year, who, so it is said, clog the machinery of public education. They are the ones who take up the time and energy that might with greater profit, it is claimed, be devoted to more promising pupils. Many taxpayers and public officials criticize the use of public funds for the education of such pupils. And yet, if the American ideal of education for "all the children of all the people" is to be more than empty words, ways must be found to fit the school as effectively to the needs of the slow learners as to the needs of the more rapid learners.²

¹Karnes, M. B., "Teaching Reading to Slow Learners," The A and B Reading Bulletin, No. 108, Allyn and Bacon, Inc.

²Featherstone, W. B., Teaching the Slow Learner, Bureau of Publications, Teachers College, Columbia University, New York, 1951, p. vii.

Teachers who have had slow learning children in a heterogeneous class have found that the academic ability of the slow learners is too low to enable them to profit from the regular school program. Neither content nor methods used in some schools would be suitable for the slow learner to experience success. In those schools where no provision is made for the slow learner by individualizing instruction, and where they are forced to compete with children of average or high I.Q., these pupils fail; they develop a failure complex toward life; ambition is either destroyed or never developed. Consequently, school becomes a nightmare for these pupils who, day after day, face repeated failure. Sometimes their self-confidence and sense of personal worth are so badly impaired that they are literally forced to seek satisfaction in ways which are unacceptable to the school and the community.

The writer realized the need for improvement of the educational program for the slow learner. This realization caused the writer to choose the problem of this study.

Statement of the Problem

The purpose of this study was to determine what curriculum adaptations and teaching procedures used in Montana schools were appropriate for teaching the slow learner.

The problem of helping the slow learner experience success seemed to require the answer to three questions: "What do authorities say are the characteristic skills and traits of the slow learner?"; "What do authorities recommend for a curriculum to meet the needs of the slow learner?", and "What methods and procedures have other teachers used that have proved successful in helping the slow learner to learn?"

Procedures

The procedures followed in this study were as follows: first, literature was reviewed relative to the problem of teaching the slow learner; second, a survey of sixth grade teachers in those schools having fifty or more teachers in the elementary system was made to determine specific methods and procedures they have used in teaching slow learners. The survey letter was sent to 96 elementary principals in the state of Montana as listed in the 1966-1967 Montana Educational Directory published by the Department of Public Instruction. These principals were requested to refer the letter to sixth grade teachers who had slow learning children in their classes.

Limitations

This study was limited to books and periodicals in the Montana State University Library and the Livingston elementary school system, and to the survey letter. The study was limited further to determine curriculum adaptations and teaching procedures in sixth grade arithmetic.

Definition of Terms Used

Slow Learner. The term "slow learner" refers to that group of children who comprise about twenty per cent of our general school population, who score between 75 and 90 on a verbal intelligence test, and whose mental retardation is severe enough to cause them to have marked difficulty in a traditional school program.

CHAPTER II

REVIEW OF LITERATURE

Literature pertaining to slow learners was reviewed to determine the characteristics of slow learners and to find information that would lead to a better understanding of curriculum adaptations and methods of teaching the slow learner.

Characteristic Skills and Traits of the Slow Learner

There is no fixed standard or level of ability below which a pupil must be called a slow learner, but in common practice pupils with an I.Q. below 91 and above 74 are so labeled. This limit on mental ability is substantiated by Featherstone,¹ Johnson,² Shapiro,³ and Baker.⁴ It is better, however, not to look at the upper and lower limits of a group but to regard the members of the group as deviating from or clustering around, a "central tendency". Thus a slow learner group may be thought of as having a "central tendency" or average of about 85 I.Q. McAndrew was critical of any attempts

¹Featherstone, op. cit., p. 2.

²Johnson, G. Orville, Education for the Slow Learners, Prentice Hall, Inc., Englewood Cliffs, N. J., p. 42.

³Shapiro, Alan, "The Story's the Thing for Slow Learners," Senior Scholastic 78:6, Mar. 8, 1961.

⁴Baker, Harry J., Introduction to Exceptional Children, The Macmillan Co., New York, 1953, p. 244.

to classify slow learning children rigidly by intelligence ratings and he stated that "The North Carolina experiment (boarding school in Winston-Salem for underachievers) has shown that the attitude of both the teacher and the taught is far more meaningful than a student's I.Q."⁵

According to Moskowitz, "The slow learner differs from the normal not so much in his desire to learn but in his capacity for, and rate of learning."⁶

Slow learners are not equally slow in all kinds of activities nor abnormal in characteristics such as social adaptability, mechanical ability, or artistic sense. In many instances they are able to get along quite well in these respects.

The slow-learning pupil learns in the same way, fundamentally, that other pupils learn, although methodology may be changed to enable slow learners to gain the greatest amount of benefit from instruction. Since he does not think and reason as well as the brighter student, he is less imaginative, and is inclined to reach conclusions without much reflection on possible alternatives.⁷

The slow learner has the same fundamental needs as other individuals; the need for feeling that he belongs and is an accepted part of a group; the need for affection and

⁵McAndrew, Gordon, "Catching Failures in Time," Time 85:49-50, Mar. 19, 1965.

⁶Moskowitz, Myron, "Teaching the Slow Learner," School Review 56:482, Oct., 1948.

⁷Featherstone, op. cit., p. 8.

understanding; the need to be able to contribute to the activities of a group.

The slow learner is a person very much like the rest of humanity. He has the same characteristics of all other pupils in school except that these characteristics vary in degree. Being, by definition, somewhat less intellectual, he does not reason or learn to manage abstractions and symbols as well as the average. By observation, however, it is difficult to tell the difference between an average child and a slow learner. Johnson concurs with this similarity when he states, "While the slow learners have the same basic emotional needs and characteristics as all children as well as the same basic methods of achieving them, they have much greater difficulty in making satisfactory adjustments to these needs because of their limited intellectual capacities."⁸

The writer needed some means of classifying the characteristic abilities of the slow learner in order to develop a basis for planning the rate of progress and determining the difficulty of subject matter that could be used. Eight traits and skills were selected as basic in judging the capacity to learn and these were used as guides in the location of materials during the investigation of literature. Most of these were taken from those suggested

⁸Johnson, op. cit., p. 48.

by Bobbitt.⁹

1. Vocabulary level
2. Reading ability level
3. Comprehension of concepts by verbal means
4. Abstract reasoning power
5. Comprehension of concepts by visual means
6. Memorization and retention span
7. Attention span
8. Repetition needed for permanent learning

Vocabulary Level. Authorities indicate that the slow learner has a low level of vocabulary. Many times as much experience with a word in a reasonably natural context will be required with slow pupils as would be required with average children. The reading and listening vocabulary must be introduced a few words at a time to enable the slow learner to understand and use the words in their natural context.

Course materials which seem desirable should be written in simple terms so that they may be understood. Sentence structure should be simple, ranging in length from 10 to 15 words; there should be a minimum of dependent clauses and compound sentences; and reading material should be closer to speech than to non-oral prose. Books for slow learners must deal with subjects appropriate for a given chronological age and

⁹Bobbitt, John F., How to Make a Curriculum, Houghton Mifflin Co., Boston, Mass., 1924, pp. 44-59.

still be simple in style, ideas, and vocabulary. According to Featherstone, it is not easy to find books which meet the requirements of simplicity in style, ideas, and vocabulary because it is not easy to write such books. Considerable care must be taken to select books that are easy enough for older slow learners and still not be too "juvenile". Slow learners are quite sensitive on this point and will often reject a book that is otherwise suitable.¹⁰

Reading Ability Level. Sixteen primary teachers in the Washington Unified District of West Sacramento, California, attacked the problem of slow learning by a careful study of seventeen primary pupils. All of the pupils were retarded in reading; and low achievement in this subject threatened their success in school. Working individually and in groups of three or four, teachers began by describing their pupils' learning deficiencies. Poor reading seemed to be the most serious and most common disability.¹¹ This was also emphasized by Karnes by the following statement:

One area which deserves more attention in the schools is the teaching of reading to slow learners. Too many slow learners are educationally crippled because they have not learned to read on a level commensurate with their ability. Lack of acquisition of the skills of reading causes failure in other subjects that depend heavily on reading ability.¹²

¹⁰Featherstone, op. cit., p. 79.

¹¹Noel, Elizabeth, "A New Look at Slow Learners," The Instructor, Dec., 1957, p. 6.

¹²Karnes, op. cit.

One should not assume that a slow learner is equally slow in all those activities that are primarily intellectual. Arithmetic computation and spelling and handwriting do not correlate highly with reading or arithmetic reasoning. Nevertheless, reading plays so large a part in these subjects that effective work in them is very dependent on how well a child can read.¹³

Comprehension of Concepts by Verbal Means. Authorities agree that the slow learner learns best when activities are based upon concrete and tangible or objective things rather than upon predominately verbal or abstract things. Often slow learners can express their ideas in pictures, demonstrations, or dramatizations more effectively than they can verbalize them.¹⁴

Slow learners have difficulty following directions. The teacher must be sure that all plans and directions are definite and specific. More time is needed in planning activities with slow learners, so that the step-by-step procedures and goals are clearly understood.¹⁵

Featherstone substantiated the idea that slow learners learn best by non-verbal means when he stated:

¹³Featherstone, op. cit., p. 3.

¹⁴Ibid., p. 66.

¹⁵Karnes, op. cit.

With slow learners, one must be especially critical and realistic in applying the principle that the activities and enterprises of the school should be carried on in a natural setting dealing with real problems, real interests, and real activities of actual people in a reasonably familiar environment. Planning and carrying out an excursion to observe and study various geographical features of the community, an industrial plant, or some other aspect of the life and activity of real people will be a good deal more meaningful and purposeful than taking an imagined or vicarious journey through the world of books and pictures.¹⁶

Abstract Reasoning Power. Authorities agree conclusively that slow learners have difficulty with abstract reasoning. They are slow to see relationships, to make inferences, to draw valid conclusions, and to generalize. Baker states that "The slow-learning child prefers concrete and practical learning to the abstract or general. He is more interested in trying to solve problems than to study the rules which govern them. He is more interested in manipulating a laboratory experiment than in learning the theory of why such an experiment should be performed and what result should be expected."¹⁷

According to Moskowitz, it is in the exercise of the reasoning processes that a marked differentiation appears when comparing the slow learner with the normal individual.¹⁸

¹⁶Featherstone, op. cit., p. 43.

¹⁷Baker, op. cit., p. 248.

¹⁸Moskowitz, op. cit., p. 477.

Featherstone also substantiates this difficulty that the slow learner has with abstract reasoning with the following statement:

Reasoning is in essence the exercise of intelligence-the marshaling of one's intellectual powers and resources in dealing with a problematic situation. Reasoning involves recognition or identification of the problem to be solved or the situation to be reasoned about, the formulation of possible solutions or courses of action which offer promise of fulfilling the requirements of the situation, the testing of these possible solutions against remembered experience. It requires clarification, revision, or selection as fitting the requirements. It is quite clear why a slow-learning child is a poor reasoner. It is poor reasoning that makes him slow.¹⁹

Comprehension of Concepts by Visual Means. It is generally agreed that activities for the slow learner should be built around the pupil's experiences or on the basis of things, processes, and activities that are real or actual in the pupil's environment. The multisensory approach, when all of the senses are appealed to and utilized whenever possible, helps make learning a more concrete process. Demonstrations with models, objects, pictures, and people should be used generously as a means of presenting ideas. Kearby found that multisensory devices and aids are especially helpful in developing concepts in arithmetic.²⁰ Curtis also stipulated that visual aids such as dramatizations, motion pictures, and demonstrations are of special value.²¹

¹⁹Featherstone, op. cit., p. 7.

²⁰Kearbey, Clyde F., "The Use of Visual Aids in Sixth Grade Arithmetic," Master's Thesis, Montana State College, 1963.

²¹Curtis, Francis D., "Specific Suggestions for Teaching Dull-Normal Pupils," School Review 44:525-532, Sept., 1936.

An article in the Research Bulletin of the National Education Association qualifies this trait of the slow learner by stating that visual and auditory perception are the least severe of characteristic defects.²²

Memorization and Retention Span. Authorities agree that the slow learner has a low power of retention and memory. Karnes states that "The slow learner responds best to immediate goals and tangible results rather than to delayed results and long-range goals."²³ Baker also points out that the slow learner prefers short-time units and specific assignments to long-time units or theoretical assignments in which he must discover goals and objectives.²⁴ Featherstone states that "The slow learner will not be able to work effectively at enterprises that take an extended period of time. He can remember fairly well what he learns from one day to the next if it fits into a growing, purposeful pattern or design."²⁵

Attention Span. Short attention and interest span seem to be a characteristic of slow learning children. Karnes suggests that periods of instruction should be shorter for the slow learner than for the normal child of the same

²²Research Bulletin of the National Education Association, Vol. XXI, 20.3, Oct., 1943.

²³Karnes, op. cit.

²⁴Baker, op. cit., p. 248.

²⁵Featherstone, op. cit., p. 64.

chronological age.²⁶ Shapiro seems to agree when he suggests that a 40-minute class period be divided into 10-15 minute segments and provide different activities for each segment. Shapiro, however, states that this is not true of story-reading and story-telling. He believes that students who find it almost impossible to sit for 20 uninterrupted minutes to an exercise or discussion will sit and listen for twice that long to a good story.²⁷

Repetition Needed for Permanent Learning. Lack of retention is another problem for slow learners, who require a great deal of repetition to reinforce learning. Baker substantiates this with the following statement:

The slow-learning child tends to learn by comparatively simple mental processes. He needs a liberal amount of drill and repetition to fix this learning although such drill should be judiciously distributed; otherwise it becomes tiring; monotonous, and uninteresting. Whenever rich, associative processes of learning such as characterize the rapid-learning child are used, the slow-learning child becomes confused and taxed beyond his comprehension.²⁸

Featherstone believes that there are many learnings that should be routinized, like the number combinations, the punctuation of words, commonly accepted patterns of speech and language use. While two examples may suffice to clinch a process in arithmetic for the bright pupil, the slow learner will likely require twenty.²⁹

²⁶Karnes, op. cit.

²⁷Shapiro, op. cit.

²⁸Baker, op. cit., p. 248.

²⁹Featherstone, op. cit., p. 86.

It would seem that a valid rule of thumb for the slow learner would be to have more practice and many more experiences with varied but closely similar situations than are necessary for the general run of children.

Curriculum for the Slow Learner

Most authorities seem to agree that the fundamental problem related to the provision of appropriate and satisfying school experiences for the slow learners is in the area of curriculum development. They indicate that the basic curriculum must be adapted or modified where an attempt is made to meet the educational needs of the slow learners.

There is disagreement among some authorities whether the curriculum should be designed specifically for the slow learners or whether the curriculum should be adapted and teaching procedures modified to meet the needs of the slow learner. Johnson supports the thesis of a special curriculum when he states:

Before a comprehensive program can be developed for the slow learners, a complete evaluation of the school curriculums must be made with the specific characteristics, background, and potential of the slow learners kept clearly in mind at all times. An adaptation of a traditional curriculum with the prayerful hope that it will solve the problem will never do the job. The program must be planned and designed specifically for the slow learners.³⁰

³⁰Johnson, op. cit., p. 26.

Moskowitz seems to subscribe to the theory of curriculum adaptation with this statement:

The answer to the plea for specially trained teachers and special curriculums for the slow learner may be met by the suggestion that teachers employ the tools at their disposal to maximum efficiency before requesting supplementary assistance, which, at best, will utilize only the present practices already available to the teacher.³¹

Baker states, "There are some other aspects of the educational program beyond the ability of any one teacher to solve. One of the most baffling is the construction of a total curriculum suitable to slow-learning children."³²

Curtis believes the success the slow learner achieves depends on the care with which teaching procedures and materials are revised and adapted to his somewhat limited abilities.³³

Woodring made this statement:

No one who has worked with these children believes that their problems can be solved merely by setting lower standards within the conventional curriculum. They need programs tailored to their special needs and these must be so planned that the slow learner can proceed at his own best rate without holding brighter children back. Many school systems now have such programs, but many others do not.³⁴

A survey of school administrators conducted by the Montana Education Association showed that a number of administrators were concerned about the need to adapt and devise

³¹Moskowitz, op. cit., p. 482.

³²Baker, Harry J., "Helping the Slow Learner," N.E.A. Journal 39:178-179, Mar., 1950.

³³Curtis, op. cit., p. 525.

³⁴Woodring, P., "Slow Learners", Saturday Review 45:53-4, Feb. 17, 1962.

instructional materials to meet the needs of the slow-learners. They believe that instructional and educational materials must be tailored. This tailoring would include special books, first-hand observations, relatively simple activities, frequent and interesting practices and review, small groupings, remedial work especially in English and reading, and opportunities for creative and perceptual experiences.³⁵

Regardless of the method of curriculum development used, there are certain basic fundamentals that would be needed to provide an appropriate learning experience for the slow learner in arithmetic. Johnson expressed this need when he stated:

Mathematics, probably more than any other academic area, has been poorly taught in terms of ease and efficiency of use. The following basic principles of sequence of instruction have been too often violated. Their violation, in working with slow learners, leads to unsatisfactory results. The first step should involve the teaching of the basic concept, preferably through a situation where a social need has been developed. In this way the concept is taught using concrete, socially meaningful materials. The second step is taken only after the basic concept has been developed. This consists of providing the child with sufficient practice (drill in the combinations, tables, and examples) until he can arrive at a correct solution rapidly and accurately. During and following the second step, the third step of instruction occurs--application. This continues throughout the remainder of the children's school life.³⁶

³⁵M.E.A.'s Curriculum and Educational Development Committee, Montana Education, Vol. 42, No. 11, Mar. 15, 1966.

³⁶Johnson, op. cit., p. 251.

The writer was particularly interested in the intermediate program for the slow learner in arithmetic as outlined by Johnson.³⁷ This is a broad outline of the skills and content one might normally include in an arithmetic program for slow learners. It is not all-inclusive but it is intended to provide a fairly concrete indication of the arithmetic ability the average slow learners should achieve and an idea of the kind of content that might be appropriately included in an intermediate program. It is also assumed that all children will not be able to achieve all that is included in the outline but will progress at their own achievement level.³⁸

Summary

The review of available literature stressed the generalization that slow learners are much like other pupils in their fundamental needs and that the slow learning pupil differs from the normal student not so much in his desire to learn, but in his capacity for, and rate of learning.

Although there is danger in generalizing about characteristics of slow learners, authorities seemed to agree on the characteristic abilities classified by the

³⁷Ibid., p. 239.

³⁸Copy of outline found in Appendix A.

eight traits and skills selected in judging the slow learner's capacity to learn. There seemed to be general agreement among the authorities that the slow learner is characterized as having a low level of vocabulary, retardation in reading ability, difficulty with verbal or abstract things, inability to do abstract thinking, learns best from real or actual experiences, low power of retention and memory, short attention and interest span, and a need for repetition to reinforce learning.

Although there are differences of opinion among authorities as to which type of curriculum is best in any particular situation, it might be said with some assurance that all would agree that a program must be developed that takes into account the learning and developmental characteristics of the slow learners as well as a content that has meaning relative to their environment and experiential background.

Curriculum adaptations and teaching procedures used by sixth grade teachers in Montana to help the slow learners are summarized in Chapter III.

CHAPTER III

CURRICULUM ADAPTATIONS AND TEACHING PROCEDURES PROVIDED
FOR SLOW LEARNERS IN MONTANA SCHOOLS

Section 75-5001 of the School Laws of Montana provides for the education of the educable mentally retarded. They are defined as those children who, at maturity, cannot be expected to attain a level of intellectual functioning greater than that commonly expected from an eleven-year-old, but not less than that of a seven-year-old.

The slow learner, as authorities have defined him, attains a maximum mental age of from 11 years to 13½ years. This places the slow learner categorically between the educable mentally retarded and the normal individual.

Since no provision is made in Montana School Law for the slow learner, provision for such programs in our schools is left primarily to the administrators and in many cases to the resourcefulness and initiative of the classroom teacher.

The state's elementary principals were contacted by the M.E.A.'s Curriculum and Educational Development Committee and were asked to describe exemplary practices being used in the schools concerning the slow learner. Over 68 per cent of the schools reported not only an awareness of the problem but were actually doing something about it, mostly

through grouping, with an emphasis on remedial reading programs, but authorities such as Baker¹ have stated that grouping in and of itself is of no particular value unless suitable educational adjustments are made. One would hardly expect any educational advantages for or against grouping without curriculum adaptations or modifications of teaching methods. Seventeen school systems not only recognized the need for more effective programs, but appeared to have promising programs going which could be further developed for greater effectiveness.

The writer used a survey letter to assist in the evaluation of teaching procedures for slow-learning children in sixth grade classes in Montana elementary schools. The survey letter, a copy of which appears in appendix C, was formulated to determine methods or procedures used in the subject areas of reading, arithmetic, science, English, and social studies. Only that portion of the survey letter involving responses to teaching procedures provided in arithmetic was used in this study. Forty-nine of the 96 survey letters sent to elementary principals were returned. Thirty-three of these contained responses pertaining to arithmetic.

In summarizing the methods and procedures used in teaching arithmetic to slow learners, the writer used three

¹Baker, op. cit., p. 252.

basic considerations for a practical course in mathematics for the low I.Q. pupil as presented in the Research Bulletin of the National Education Association.² These basic considerations were:

1. The material must be within the ability of the group, concrete, expressed in simple language, and involving much repetition.
2. The material and methods of instruction must increase the pupil's ability in the accurate use of fundamental skills.
3. The material must acquaint the pupil with social situations in which mathematics is needed and help him to apply mathematical tools in these situations.

Table I presents a summary of responses to teaching methods used in sixth grade arithmetic for the slow learner, that indicated agreement with the first basic consideration. These responses that agreed with the first basic consideration were: the use of concrete objects and visual aids to develop arithmetical concepts; the use of materials or media expressed in simplified language; keeping assignments short to accommodate the short attention span characteristic of slow learners. The responses given in each category were tabulated and assigned a percentage evaluation compared to the number of total responses received on the survey letter.

²Research Bulletin of the National Education Association, op. cit.

TABLE 1. NUMBER AND PER CENT OF RESPONDENTS USING EACH TEACHING METHOD RELATIVE TO MATERIAL WITHIN THE ABILITY OF THE GROUP

Teaching method used	Number of responses	Per cent	Total number of replies
Uses concrete objects and visual aids to develop concepts	10	30.3	33
Uses media expressed in simple language	4	12.1	33
Keeps assignments short to accommodate short attention span	4	12.1	33

Of the respondents who believe that arithmetic concepts and basic arithmetic processes should be taught, insofar as possible, through the use of concrete objects and visual aids, several emphasized the use of diagrams, charts, flannel boards, overhead projectors, filmstrips, and liberal chalkboard work.

In Chapter II it was pointed out that a short attention span was found to be characteristic of slow-learning children. Only a few of the respondents indicated that they provided for this trait in teaching arithmetic to the slow learner.

Table 2 presents a summary of responses that indicated agreement with the second basic consideration. The responses that agreed with the second basic consideration were: the provision for extensive practice (drill) and memorization of basic fundamentals; provision for individual help before and after school; use of competitive games to develop proficiency in arithmetic fundamentals.

TABLE 2. NUMBER AND PER CENT OF RESPONDENTS USING EACH TEACHING METHOD RELATIVE TO THE USE OF FUNDAMENTAL SKILLS

Teaching method used	Number of responses	Per cent	Total number of replies
Provides extensive practice (drill) and memorization of basic fundamentals	15	45.4	33
Provides individual help before and after school	5	15.1	33
Uses competitive games to develop proficiency in fundamentals	6	18.2	33

A larger percentage of the respondents indicated an awareness of the need for extensive drill and memorization of basic fundamentals than they did for the other two categories. Two respondents indicated that mastery of the basic fundamentals is the most that can be hoped for and extensive drill is necessary with slow learners.

More of the respondents provided individual help before and after school than stressed individual help in the classroom.

Of the respondents who used games to supplement repetitious drill, one stressed the idea that games and other supplemental materials are more effective in teaching fundamentals than the textbook. The slow learner needs a liberal amount of drill and repetition to fix learning and such drill can become tiring, monotonous, and uninteresting.

Table 3 presents a summary of responses that indicated agreement with the third basic consideration. These responses that agreed with the third basic consideration were: the use of practical problems related to the child's experience in everyday situations, and the content for the arithmetic program taken from community experiences.

TABLE 3. NUMBER AND PER CENT OF RESPONDENTS USING EACH TEACHING METHOD RELATIVE TO THE USE OF MATHEMATICS IN SOCIAL SITUATIONS

Teaching method used	Number of responses	Per cent	Total number of replies
Uses practical problems related to child's experience in everyday situations	6	18.2	33
Uses content for arithmetic program taken from community experiences	2	6.1	33

The findings in Chapter II indicated that a slow-learning child prefers concrete and practical learning to the abstract or general, and that real problems, real interests, and real activities of actual people in a reasonably familiar environment are more meaningful to the slow learner than vicarious experiences.

Summary

Findings by the M.E.A.'s Curriculum and Educational Development Committee indicated that most schools are aware of and are working toward a more definite program for the slow learner.

The results of the responses to the survey letter as presented in Tables 1, 2, and 3 indicated that most of the teachers responding offered some degree of specialized instruction to the slow learners. Some teachers seemed to be aware of the need to use concrete and tangible or objective materials and the need for extensive drill and memorization of the basic fundamentals. There was less awareness of the need to provide simplified materials; to provide for a short attention span; to provide individual help; to use games to supplement drill; to use practical problems related to everyday situations or to use arithmetic problems taken from community experiences.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study has been concerned with the problem of determining the characteristic skills and traits of the slow learner; what type of curriculum best meets the needs of the slow learner; and what methods and procedures have been used by other teachers in Montana schools to help the slow learner to experience success.

The review of literature, which was limited to books and periodicals in the Montana State University Library and the Livingston elementary school system, stressed the fact that the slow-learning pupil learns in the same way, fundamentally, that other pupils learn, but methods of instruction must be adapted to the skills and traits of the slow learners.

Most authorities agreed that the fundamental problem related to school experiences for the slow learners was in the area of curriculum development and that a meaningful curriculum must be devised, adapted or modified if it is to meet the educational needs of the slow learners.

The results of the survey letter would seem to indicate that most of the educational needs of the slow learners are largely dependent on the classroom organization and teaching procedures of the individual teachers.

Conclusions

On the basis of the review of literature, those concerned with the education of the slow learner must take into consideration the characteristic skills and traits of the slow learner if they are to effectively provide a meaningful educational experience.

The curriculum should differ both in basic content and in emphasis from that provided normal children, and it must be developed with reference to the characteristics, experiences, potential, and environmental backgrounds of the slow learners.

Although the slow learners are intellectually incapable of attaining a high degree of academic skill, they are intellectually capable of acquiring many of the academic skills to a degree that they can become competent and proficient in their use for purposes of daily living.

The results of the survey letter seem to indicate that more needs to be done by teachers in Montana schools to provide for the individual differences of slow-learning children commensurate with their characteristic skills and abilities.

Recommendations

The writer suggests that any teacher who has slow-learning children in a class should employ the latest findings in meeting the pupils' individual needs. This would necessitate the need for some research on the part of the teacher.

Characteristic traits of the slow learner are a low vocabulary level and low achievement in reading. The percent shown in Table 1 of Chapter III indicates a need for a greater awareness by the teacher of these traits and provision for them in the arithmetic program.

In Table 2, Chapter III, the response seemed to indicate that more teachers need to work toward more individualized instruction for the slow learner. The responses in Table 2 also indicated that more teachers should use a liberal amount of supplementary materials with the slow learner.

The results from Table 3, Chapter III, indicate that more teachers need to use practical problems related to the slow learner's experiences, and that teachers could make a greater effort to provide learning experiences in this area.

The writer would also recommend further study of related problems of the slow learner such as the construction of a total curriculum which would provide for his education from the time he enters school until he reaches the finishing point of his formal education. Whether to segregate the slow-learners so that classes might be more homogeneous or keep them in regular classes so they will not feel set apart is also a practical problem.

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APPENDIX

Appendix A

Outline of an Arithmetic Program
for Slow-Learning Children
in the Sixth Grade

Appendix A

1. The children's vocabularies should be expanded to include all arithmetical processes, time (hours, minutes, seconds, days, and months), commonly used signs, and various common measurements. Standard textbooks often emphasize the learning of such technical terms as minuend, subtrahend, multiplicand, multiplier, divisor, dividend, remainder, numerator, denominator, common denominator, addend, quotient, and so forth. While the concepts are used continuously, the terms are seldom if ever used in practical, daily problem solving. The concepts can be taught without the use of the technical terms. Instead, descriptive terms the children readily understand should be used. Teach the concepts; the terms are seldom used or even remembered by most normal adults.
2. Instruction should include concepts related to the number system (place, zero, sequence, and ordinal numbers), grouping (addition, subtraction, multiplication, and division), carrying and borrowing (other terms are also in common use), fractional parts, measurement, tables and graphs, monetary system, and some common geometric forms.
3. Processes that should be taught should include:
 - a. addition (of any numbers and with carrying);
 - b. subtraction (of any numbers and with borrowing, excepting examples involving negative results);
 - c. multiplication and division (tables through the 5's, carrying in multiplication, and remainders in division);
 - d. all signs ($+$, $-$, $\times$, $\div$, $=$); and
 - e. fractions through sixteenths, including the finding of fractional parts and performing simple addition of fractions.
4. The understanding of money should be developed to the point where the children can:
 - a. apply processes learned;
 - b. understand parts and relationships through \$1.00; and
 - c. read and understand a vocabulary that includes such terms as cash, interest, installment, payment, and so forth.

Appendix B

Letter Sent to Elementary
Principals in Montana

Appendix B

May 16, 1967

Mr. John Doe
Elementary School Principal
Plainsville, Montana

Dear Mr. Doe:

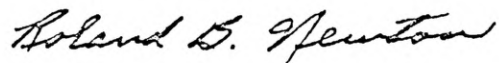
As part of my requirements for a Master's Degree in Education from Montana State University, I am conducting a study to determine curriculum adaptations and teaching procedures for slow learning children in Montana. I am respectfully asking for your help in contacting the sixth grade teachers in your school for the purpose of determining any teaching methods or procedures they may have used that have proven successful with slow learners.

I realize that this is a busy time of the year in preparing to close school, but I hope that your teachers will take a few minutes to complete the enclosed survey instrument.

Would you please pass this survey letter on to any of your sixth grade teachers who have slow learning children in their classes, and return the letter to me in the enclosed envelope?

If you wish a summary of the results of this study, please indicate this on the survey letter and I will be very happy to send the summary to you.

Sincerely yours,



Roland B. Newton, Principal
Washington School
Livingston, Montana

Appendix C

Survey Letter Sent to Elementary
Principals in Montana

Appendix C

May 16, 1967

Dear Educator:

As part of the requirements for a Master's Degree in Elementary Education, I am writing a research paper entitled "Procedures for Improving the Educational Accomplishments of Slow Learners in the Sixth Grade". The purpose of this study is to determine what methods and curricula can be used to teach the slow learner in the sixth grade. While teaching sixth grade children for several years, I have experienced concern for the better education of the less fortunately endowed of our children. I have felt a need for more explicit help in planning a suitable curriculum and teaching procedures for the slow learner.

Authors of literature that I have reviewed have interpreted the term "slow learner" to mean slow in learning intellectual things, having an academic ability too low to enable them to profit from the regular school program in which neither content nor methods would be suitable.

Often teachers learn from other teachers, and I feel that many teachers in our schools who have taught slow learning children have found specific methods and procedures that have helped the slow learner to experience some success in learning. Although specialists in subject matter fields have shown some progress in providing for the slow learner, much more needs to be done. As a teacher, I feel that much of the success a slow learner may have still depends to a large extent upon the resourcefulness and initiative of the individual teacher.

If you have found any methods or procedures in your teaching to be particularly valuable in helping a slow learner to experience success, would you please take a few minutes to briefly state what methods you have used in the subject areas listed below?

READING

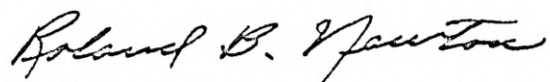
ARITHMETIC

SCIENCE

ENGLISH

SOCIAL STUDIES

Thank you,

A handwritten signature in cursive script that reads "Roland B. Newton". The signature is written in dark ink and is positioned above the typed name and address.

Roland B. Newton, Principal
Washington School
Livingston, Montana