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ABSTRACT    Four bibliographies from Dean's Grant Projects (programs designed to prepare regular class teachers to work with mainstreamed handicapped students) are provided. Entries include author's name, title, source, date and pagination information, and, in two of the bibliographies, a brief annotation. The following topics are the central concerns of the bibliographies: teacher attitudes towards children with special needs, math and the handicapped, and science education and the handicapped. The final bibliography, also on science instruction for the handicapped, was prepared by Science for the Handicapped Association, an interest group of the National Science Teachers Association. (CL)

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SELECTED BIBLIOGRAPHIES

Dean's Grant Projects

1981

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REPORTS OF THE DEAN'S GRANT PROJECTS SERIES

1 DEAN'S GRANT PRODUCTS (INTERIM REPORT #1) 1981

   Colorado State University. Marilyn F. Fender, Editor.

3 TOWARD A RESEARCH BASE FOR THE LEAST RESTRICTIVE ENVIRONMENT: A COLLECTION
   OF PAPERS. University of Kentucky, Dean's Grant Project. January 1981.

4 SELECTED BIBLIOGRAPHIES: DEAN'S GRANT PROJECTS 1981

Minneapolis, Minnesota
1981

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   Developed through the DGP, Virginia Commonwealth University

Science Education and the Handicapped: An Annotated Bibliography of Selected Literature
   Developed through the DGP, Virginia Commonwealth University

Science for the Handicapped Association Bibliography
   Developed by SHA, an interest group of the National Science Teachers Association

Note: These are but a rough start at a collection of bibliographies on topics of interest across the Dean's Grant Pre-Service Training Projects. Criteria for inclusion are related to relative scarcity of representative bibliographies on selected topics. Dean's Project (and others) will have developed bibliographies which will contribute to this collection. Projects are welcome to forward short, selected bibliographies to the NSSP for possible inclusion in an expanding collection.

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Questions may be directed to the National Support Systems Project, University of Minnesota, 350 Elliott Hall, Minneapolis, Minnesota 55455.
Teacher Attitudes
Toward
Children with Special Needs
-A Selected Bibliography-

Fredric Linder
Howard Ozmon
Brenda Kauffman
Judy Starr

School of Education
Virginia Commonwealth University
Richmond, Va.
July 1980

These training materials were developed pursuant to Grant OEG G007801524 from BEH.USOE/HEW. Opinions expressed are those of the authors. No official endorsement by the U.S. Office of Education or Virginia Commonwealth University should be inferred.

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Virginia Commonwealth University


Glazzard, P. Simulation of handicaps as a teaching strategy for preservice and inservice training. Teaching Exceptional Children, Spring 1979, 101-104.


Virginia Commonwealth University
Math and the Handicapped: An Annotated Bibliography of Selected Literature

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MATH AND THE HANDICAPPED:
AN ANNOTATED BIBLIOGRAPHY OF SELECTED LITERATURE

I. Diagnostic-Prescriptive Approach


Discusses the relationship between math skills and reading ability as it relates to the learning disabled, emotionally disturbed, or mentally handicapped student. The author explains that many math books require reading at a level beyond the ability of many special needs students.


Describes a three month individual diagnostic and remedial program which significantly reduced the underachievement of participants.


Argues for more awareness and exploration of individual student differences and handicaps.


Reviews literature on the diagnostic teaching approach, with particular emphasis on mathematics in the elementary school.


Within the context of a larger view of curriculum and methods variables, the authors present a model for cognitive diagnosis and prescription. A content taxonomy is related to behavioral indicators and kinds of psychological learning products. Procedures for diagnostic-prescriptive teaching are discussed and illustrated; sample lesson plans are included.


Issues in mathematics assessment and programming for the handicapped are reviewed and Project MATH, a criterion-referenced curriculum designed for handicapped learners, is described. Project MATH provides activities in six major areas: sets patterns, geometry, numbers, fractions, and measurement. Analized are the following project components: the interactive unit (a system which specifies combinations of instructional interaction), needs assessment, concept inventory (used for screening and progress assessment), instructional evaluation items, and verbal problem-solving tasks. The role of the teacher in instructional management is emphasized.

Deals with the diagnostic-remedial process, particularly where children appear unable to learn arithmetic. Perceptual skills, motor disinhibition, perseverance, language, and reasoning are discussed; and a few remedial techniques are discussed.

II. Task-Analysis


The authors report research suggesting that when the task-analysis procedures of Gagne are combined with meaningful mastery learning of subordinate tasks in a hierarchy learning of a mathematical task can be quite effective.


Describes a method of analyzing desired pupil behaviors into subordinate behaviors.

III. Activities Designed to Help Teach Math Concepts to Specific Types of Handicapped Students


An alternative algorithm for addition of whole numbers is presented.


An experiment is described in which slow learners were successfully taught mathematical concepts by audiotape.


A demonstration-plus-feedback technique was applied in an attempt to reduce the systematic inversion errors in subtraction in nine LD students (ages 9-11years)


Describes a novel approach to fractions involving hooking up stretching and shrinking machines.

The article discusses different types of failure in mathematics and relates them to the problem of learning disability and presents and examines specific data on the attainments and characteristics of LD children.


Presents a revised model for individualized mathematics programming for the LD adolescent.


Discussed is use of pictorial aids to develop word problem skills for addition and subtraction of handicapped children.


Proposes a plan for children to regularly evaluate their own skills in computation.


An historical treatment of computational devices that use counters on a checkerboard. Discussion includes works of John Napier, Walter Minto, and Nicholas Saunderson.


Describes the process of teaching abacus to moderately retarded blind students as a means of developing concepts of numbers, addition and subtraction, and money values.


Presents a variety of ideas for practicing the basic facts of arithmetic.

Kurtz, Ray and Joan Spiker. "Slow or Learning Disabled...Is There a Difference?" Arithmetic Teacher, Vol. 23, No. 8 (December 1976), pp. 617-622.

Characteristics of the slow learner and the learning disabled child are identified. Educational procedures to help the learning disabled child in mathematics are discussed.


Learning activities are described involving teaching different techniques that can help a child learn the basic facts.

The Braille representation for the alphabet, for special symbols, (such as the percent sign, the period, the number sign), for digits, and for metric symbols are presented.


Five mathematical puzzles of the type requiring numbers or pieces to be placed in certain positions to provide a specific result are described. The puzzles are presented in the form of dice, dominoes, boards, and numbered pegs.


Describes a math-oriented approach to remediating learning disabilities in children.


Several games involving both motor behavior and practice with mathematical skills are described. These include adaptations of musical chairs (subtraction), call ball (multiplication) and ring toss (linear movement); other games are designed to provide practice on identifying numerals, telling time, using money, and naming fractions.


A discussion of the advantages of using geometry with handicapped learners is given.


Intended for the classroom teacher, the article offers suggestions for dealing with the child who has a learning disability in mathematics.


Two mathematics programs developed for presentation via computer-assisted instruction are discussed: ADD, a computer based program for the mentally handicapped child who requires frequent successes in initial learning, and SHAPE, a program demonstrating the development of quantitative concepts.


A concrete approach to subtraction problems with minuends to 19 is presented.
I. MAIN SOURCES OF INFORMATION


Articles and papers in this book have been divided into 10 sections:
1) Science Edu & the Handicapped
2) Science for Everyone
3) Preparing teachers to work with the handicapped
4) Resources for Teacher/Schools
5) Science & the Auditory Handicapped
6) Science & the Orthopedically Handicapped
7) Science & the Visually Handicapped
8) Extending the Science Program Beyond the School
9) The Handicapped and Careers in Science and Related Fields
10) Science Education and the Handicapped - Implications for the Future


Chapter covers the following objectives:
1) Adapt some science activities for use by blind students and deaf students
2) Analyze the content of a scientific experiment to determine what variables are important as regards adaptation
3) Decide what evidence would normally be associated with the variables defined in item 2
4) Identify the possible modalities that could be used in collecting evidence
5) Adapt the apparatus as necessary
6) Devise a technique for having handicapped students record data

Science and Children, March, 1976 issue devoted to the subject. Several articles from this issue are included in the following list.

II. GENERAL INFORMATION


This study was designed to determine if special elementary students could learn basic science concepts. Students included the physically handicapped, emotionally disturbed, educable mentally retarded, and trainable. Modules with pretest and posttest were used. Results indicated that regardless of handicap, students were able to work successfully and adequately in science.


Describes a conference that included among its participants handicapped students and scientists. Purpose: to explore barriers to science education faced by handicapped students and how to overcome those barriers.

Describes observational measures being developed to diagnose handicapped children with high ability. Discusses the program for deaf, blind and LD students at the American University.


Reports results of a survey of teachers' direct contact and experience with exceptional students in their classes. Results indicate the majority of teachers have had some experience.


Some ways in which exploratory activities of the preschool child involve science concepts are described. The role of adults knowledgeable about both science and child development is stressed. Emphasis is placed on hands-on experiences.


Defines and discusses the handicapped child and what mainstreaming will mean to both the child and the teacher.


Presented are facts related to what putting handicapped children with normal children will do. The article favors teaching handicapped and normal children together.


Urges teachers of science to handicapped children in the mainstream school to accept the challenge of involving the handicapped child as a contributing member of their regular classes. To do this, the teacher must have access to a variety of materials.


The integration of physically (sensory and orthopedic) handicapped students into science classes creates a complex problem for science educators. Suggestions are offered for teacher preparation and for the development of specialized materials and modification for instructional strategies.


Activity-based and inquiry-centered science programs can help handicapped students and students from low socio-economic backgrounds in the areas of verbal fluency, language complexity, logic, and attitudes. ESS, SCIS, and SAPA materials are all addressed.
The possible impact of the White House Conference on Handicapped Individuals and the insurance of the regulations implementing the Rehabilitation Act of 1973 on the handicapped movement in education are detailed.

III. SPECIFIC HANDICAPPING CONDITIONS

A. Mental Handicaps


Reviews the research and general literature on science education for educable mentally retarded, and recommends using the Santa Cruz curriculum guide and preparation of study units based upon scope and sequence charts for the retarded.


Special education teachers were introduced to ESS units and used these materials in their classes.


Study of 207 students investigating the effects of ESS on selected science skills including communication, observation, and inference.


Describes the units of a science program for educable mentally handicapped students developed by the Biological Sciences Curriculum Study Project and the role of the teacher during implementation of the program.


Generalizations about the educable retarded are presented. The need is for small group instruction and more time for a child to internalize science processes and information. Suggestions are given to help overcome attention span difficulties, problems of recall and difficulties with transfer.


Guidelines which any educator should observe as he incorporates science into the curriculum for the mentally retarded are offered. Active participation with materials is essential. Teaching should proceed from the known to the unknown.

Presented are reasons why EMH children have usually been deprived of science in their curriculum as well as discussion of a study done to counteract these problems. Curriculum programs specifically developed for these children are described.


Reviews prepared by NSTA Curriculum Review Center at the University of Georgia, Athens, are presented. The Me Now Program is described in detail—shoving organization into four units representing a two-year instructional program for an Educable Mentally Handicapped Class.

B. Emotional Handicaps


Describes the use of individualized science lessons for primary grade children at a residential school. Lessons were designed in activity style for 1 or 2 children working together, apart from the main class. Verbal encouragement, praise, and tangible reinforcement.


Individualization of instruction for the learning-disabled and/or behavior-disordered student is considered a must. Contract teaching, a programmed type learning plan, is described in five basic steps. Numerous effective learning experiences are possible.


*Secondary education

C. PHYSICAL HANDICAPS

1. Auditory Impaired


Examines how the performance of 8 1st grade deaf students was modified by S-APA. Conclusion—student learning not dependent on language ability.

The study was designed to determine if experiences in manipulating physical objects could increase classification abilities of deaf students ages 10-13. Goldstein-Sheerer Object Sorting Test forms were used in a pre-and posttest design. Analysis of data revealed increased scores of deaf children in experimental group.


A review of selected books, articles, papers and reports dealing with science for the elementary, secondary, and college levels.


SCIS materials are modified for use with acoustically handicapped pupils.


Describes a program in which SCIS materials were successfully modified for a class of young auditorially impaired students. Vocabulary development and a positive attitude were noted in the children.


An active, materials-centered approach to learning, using the Science Curriculum Improvement Study (SCIS) is described in its use at a school for the hearing impaired.


Describes the specialized techniques required for teaching science to deaf students. Emphasis is on the use of the program Me Now developed by the BSCS group as a science course for use with young deaf children or verbally less able children.


An innovative science program recently developed for use with educable mentally handicapped students was tested on 6 low-verbal, hearing impaired secondary students of normal intelligence.


A comprehensive, sequential laboratory science and art curriculum for deaf elementary school children at The American University is described. The curriculum is based on discovery experiences from adapted ESS, SCIS and S-APA lessons with parallel art lessons.

States the importance of teaching deaf children science process skills (as opposed to facts and concepts), so that they can better cope with the changing world after graduation.


Investigates the cognitive and social aspects of a mainstreamed setting for deaf children. Twelve mainstreamed children placed with non-handicapped children in an elementary school were compared with nine resource deaf children. Reactions were assessed. Results showed no difference between resource students and mainstreamed students.


Stresses the need for including the problem-solving approach with young deaf students to develop a scientific attitude. Includes 8 considerations when presenting experiments and demonstrations for more interesting and informative lessons.

2. Visually Impaired


A teacher of visually handicapped students at the upper elementary level describes a lesson plan from a creative science program which involves students in a model experiment about plant growth. The lesson is explained to be based on a conventional 5th grade science text and adapted for the needs of visually impaired students.


Describes how to adapt physical science laboratories which depend on visual data input for blind students. Gives instruction for graph construction, use of the tape recorder, solving mathematical problems with a Braille abacus and other suggestions for physical science laboratories.


Presents an operational construct for the systematic identification, classification, development, evaluation and production of educational aids for visually handicapped students.


An instrument which affords blind students opportunities for direct observation, experimentation, and discovery is described. Accompanying the light sensor is a manual containing 25 experiments.

Discusses how a science teacher should help visually impaired students and how he can cope with their problems. Also discusses what a science teacher can provide for a visually impaired student's safety and how this student should be helped to do lab activities.


Describes the following programs for blind and handicapped students: a four-year science curriculum for elementary students and an Enrichment Science Laboratory for secondary students.


Experiments with adapted apparatus which allow blind children to discover principles are described. Individualized experiences, specifically designed, are developed in four curricula and a sample lesson is presented.


Describes earth science activities for the visually impaired student. Includes soil type identification stream table erosion, and relief map activities. Recommends a multi-sensory approach to the teaching of earth science and hands-on activities.


Reports an investigation concerning whether additional concrete experiences with objects will foster the logical development of blind children. The success of the ASMB units for various goals and various learner groups are discussed and tentative conclusions drawn. Significant gains were made.


This study was conducted to analyze the classification ability of middle class, culturally diverse, and visually impaired children after instruction in a SCIS unit. The SCIS unit was effective in improving student abilities to classify.


Describes life science activities for blind or visually impaired students including aquarium studies, plant germination, classroom animals, and outdoor activities designed with a multi-sensory approach.

Stresses the fact that science activities can be styled to the visually handicapped students' levels and degrees of independence. Use of extensive hands-on, concrete experiences as emphasized by Adapting Science Materials for the Blind (ASMB) is encouraged.


Describes how SCIS programs can be adapted for visually impaired children, taking a laboratory approach—stressing observation, manipulation of materials, and development of language skills to describe and explain events. It includes 1 example each from the physical and biological sciences, illustrating the specific adaptation of the activities.


Describes some of the adaptations of science exercises found in the program Adapting Science Materials for the Blind. This program enables blind and other visually impaired pupils to participate in the activities of SCIS.


Described are alternative approaches for developing visual perception skills found in using selected science experiences. Use of various science programs available, such as ESS, SCIS, OBIS, and Matai is suggested. Visual sequencing is prescribed and described.


A college mathematics teacher shares experiences in the teaching of blind students. Suggestions are given on topics such as classroom procedures and testing.

3. Orthopedically Impaired


Discusses the need to include relevant experiences designed around some of the biological and physical sciences to help physically handicapped children learn about their conditions and adjust to their lifestyles. Diagrams and descriptions of some examples of adapted equipment are included.

IV. INCORPORATION OF OTHER ACADEMIC AREAS

The laboratory approach to science and mathematics is described as a refreshing change for both teacher and students. Suggestions are given for planning a laboratory-based program. Guidelines for teachers of both handicapped and non-handicapped are included. A school for handicapped children in Minneapolis is described.


Reviewed are recent developments in science education and art programs for mainstreamed handicapped children. Described are such projects as the individual science programs and "Artists in the Schools."


The use of science experiments on tape are shown to provide for individual differences from the gifted child to the handicapped in developing skills in the language art area, developing significant concepts, and making learning come alive.

V. ACTIVITIES SOURCE BOOKS


Describes selected ESS units that have been used successfully with mentally handicapped students.

Coble, Charles R. and others. Mainstreaming Science and Mathematics: Special Ideas and Activities for the Whole Class. Goodyear Publishing Co., Inc. 1640 S. 5th Street, Santa Monica, Calif. 90401 ($8.95)

Ideas are presented for teaching science and math to elementary classes in which handicapped children have been mainstreamed. Info. on daily objectives, teacher preparation, and student activities is provided for 36 science topics (such as investigating the structure of matter, identifying green plants, and studying the human body systems), and 36 math units (inc. learning to count, recognizing geometric shapes, studying the metric system, and handling checking acct's.)


Intended for use with exceptional children, the teaching guide contains directions for 108 science experiences in the areas of air; electricity; heat; light; machines; magnets; minerals; seeds; sounds; and water. Tasks were selected to meet the following objectives: promote learner interest, emphasize direction following and predictable outcomes, promote learner participation, emphasize multisensory involvement with the environment, provide opportunities for cooperative projects, strengthen academic skills. Included - list of materials needed, illustration, directions, note about practical applications.


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