

1978

## Science and Mainstreaming the Educable Mentally Retarded Students

Muhammad Hanif  
*University of Louisville*

Follow this and additional works at: <https://scholarworks.uni.edu/istj>



Part of the Science and Mathematics Education Commons

*Let us know how access to this document benefits you*

Copyright © Copyright 1978 by the Iowa Academy of Science

---

### Recommended Citation

Hanif, Muhammad (1978) "Science and Mainstreaming the Educable Mentally Retarded Students," *Iowa Science Teachers Journal*: Vol. 15: No. 1, Article 23.

Available at: <https://scholarworks.uni.edu/istj/vol15/iss1/23>

This Article is brought to you for free and open access by the IAS Journals & Newsletters at UNI ScholarWorks. It has been accepted for inclusion in Iowa Science Teachers Journal by an authorized editor of UNI ScholarWorks. For more information, please contact [scholarworks@uni.edu](mailto:scholarworks@uni.edu).

**Offensive Materials Statement:** Materials located in UNI ScholarWorks come from a broad range of sources and time periods. Some of these materials may contain offensive stereotypes, ideas, visuals, or language.

# SCIENCE AND MAINSTREAMING THE EDUCABLE MENTALLY RETARDED STUDENTS

*Muhammad Hanif*  
School of Education  
University of Louisville  
Louisville, Kentucky 40208

*"If you put a battery in a light bulb and hook it up, the light will come on."*

*"Take a magnet and hook it to the battery."*

*"No, you hook the battery to the bulb."*

*"And, if you cut half of the dry cell battery, you will see a black thing inside."*

*"Wow! he is going to shock us."*

These are the responses made by some of the Educable Mentally Retarded (EMR) students in Mrs. Ford's special education class when they saw magnets, light bulbs, dry cells and electric bells. Another group of fifteen regular fourth grade children joined eleven EMR children and performed experiments in a teacher directed discovery lesson in a "mainstreamed" classroom. The mixed group responded very well and the EMR children did not exhibit any noticeable evidence of their mental retardation. They eagerly volunteered and successfully lighted bulbs, rang electric bells and demonstrated the use of an electromagnet. They hypothesized before finding out the objects through which magnetism can pass and showed great confidence while handling the materials.

## Mainstreaming

The concept of mainstreaming reinforces the belief that all children are capable of learning if education is individualized and attention is given to learning styles, rates of learning, and individual capabilities. It is now widely accepted that children with mild learning impairments should no longer remain segregated and confined to separate classroom situations during their entire day in school. Effective mainstreaming addresses the academic and social needs of all youngsters and functions in the least restrictive environment. The basic assumption that the large majority of handicapped children can be absorbed into regular classrooms with adjustments and adaptations in the existing instructional programs is being accepted by the growing number of teachers.

Among other philosophical and methodological changes in the field of special education, the state legislations and the judicial system are upholding the rights of handicapped children to be educated with non-handicapped children. These laws emphasize the importance of educating all children by providing equal opportunities without labeling and categorizing them. (Molloy, 1976).

## Non-Academic Subjects and Mainstreaming

In non-academic subjects such as Arts and Crafts, Music and Physical Education, children with special needs can be absorbed without great difficulty. In a vocational shop project at the Rowe State School, one

hundred retarded students, ages 16-21, produced hand printed Christmas cards and learned the ancient craft of Batik (Wachtman, 1974). Wine (1973) found that extra-curricular activities are very helpful to promote interaction between EMR students and the regular classroom students.

The mentally retarded and the children with learning disabilities often find the printed words hard to understand. They are handicapped in dealing with abstractions. Therefore, attempts to educate them through the medium of written words meet with very little success. These children respond much better to concrete situations especially when the activities stimulate their interests. Duncan (1943) believes that their ability to deal with relationships and correlates in concrete situations is equal to those of average children.

### **Science Facilitates Mainstreaming**

The premise of this article is that science activities particularly those which are based on experiments facilitate mainstreaming the mildly impaired children. Among the academic subjects, science being action oriented, provides opportunities for active involvement. Many of the intellectual difficulties experienced by children with mild learning problems such as EMR and LD can be minimized if the learning activities excite their imagination and provoke their interests; science has the potential to do so.

Science education helps to mainstream handicapped children provided the teacher accepts the challenge of involving all children as contributing members of the classroom. Children of varying abilities, if provided with opportunities to pursue their interests and work at their individual levels, can reach their potential. The EMR children with success oriented science experiences will improve their self-concept and enhance their motivation for learning. The children with normal abilities will feel happy to help the slow ones and develop positive incentive for higher goals. The mutual benefit will thus contribute to create a healthy learning environment for all children.

### **Science Facilitates Language Development**

Science offers unlimited opportunities to cultivate the natural curiosity of children and promote the process of language development. One of the major reasons for language deficiency among many children is their inability to extend their thought processes. They find it hard to conceptualize abstract words, develop creative ideas, and comprehend a new situation. Science can create an atmosphere which illuminates their sensory world. By using a magnifying glass, children enhance their observation skills; refracting light through a prism, they promote their color perception; and making a comparative study of the growth of plants, they understand cause and effect relationships.

Using science as a vehicle, the EMR children will gradually develop interest in reading and pay attention to the printed word. In order to fire rockets, Mrs. Herbart's slow fourth graders at Louisville Junior Academy developed motivation to read and follow directions. By capturing the imagination of



these children, science opened new avenues for reading and learning. Each successful launching of a rocket inspired them to study more about rocketry.

### Nature and Scope of Science Activities

In a mainstreamed classroom, educable retarded children will present some formidable problems for the teacher. Having difficulty in attention span, recalling, transferring and conceptualizing, the educable mentally retarded children need more concrete experiences which are related to their real world. By preparing individualized lessons, controlling vocabulary, and introducing concepts based on previously acquired knowledge, a teacher can compensate for their difficulties. Teacher directed discovery approach, small group instruction on topics of common interest, and individual help on independent activities are other guiding principles to meet the needs of these children. Science textbooks have to be adapted for high interest and low vocabulary. Programs such as SCIS provides opportunities to the teacher in mainstreamed situations to modify lessons and materials according to the ability levels of students. Among the alternatives suggested for developing various concepts, teachers can select the one which is more appropriate in terms of the needs of her special children.

Mr. Rupert, on the basis of his experience with a specially designed science program for mentally retarded students observes that "as a teacher, you can eliminate problems with attending behavior when students get involved with experimental activities." (Daily, 1971). Experiments are one of the most effective strategies for mainstreamed situations. They provoke interest for learning and provide opportunities for success and excitement. Since the EMR children face difficulty in abstract thinking, experiments help to bridge the gap between the known and the unknown.

Simple experiments related to the immediate environment of children should serve as the starting point. Experiments which require the use of concrete materials help in bringing learning at the children's level. In the selection and organization of experiments, ability levels of the children should be considered. By providing science materials and tasks which children can handle with success, a teacher can build a backlog of successful experiences.

Gardening is another activity which can easily attract the EMR children for action and involvement along with regular children. Germination of seeds, growth of plants, effects of light, water, and soil on plants are interesting topics for all children. Extension of these activities may emerge in the form of home gardening which will find support from a majority of the parents. Measuring and recording the rate of growth of plants, speaking and writing about self-grown plants, and drawing pictures of plants are additional activities which can be developed around gardening.

Construction activities in science will be interesting both to the EMR and the regular children. Making a wagon, a scale, a wind vane, and an electric board will hardly discriminate the EMR children in a mainstreamed situation. Using hand tools to make simple model homes, regular and EMR children will work on equal footing. Construction activities are helpful to stimulate

imagination and promote creativity and problem solving ability among children of varying abilities.

Science activities can be easily individualized in an integrated classroom. Studying animals and birds, slow students can concentrate on observation of living beings, classifying them under different categories, learning how to take care of them, building bird feeders, and drawing pictures of their favorite pets. Students of average and higher abilities can study the animal habits, life cycles, and eco-systems. Some projects of common interest may emerge for cooperative efforts among EMR and regular children. A resourceful and imaginative teacher will find many opportunities to make constructive changes in science education to promote integrated learning for handicapped and regular children.

Science proves helpful in leading children of all abilities into other curricular areas. Study of rocks and fossils will enable them to build new vocabulary, collect pictures, and make science books of prehistoric animals, learn map skills in relationship to places where fossils were discovered. They can read stories about geologists. Children who have rock collections may display their exhibits and make presentations. Those who are interested in making their own samples of fossils, will develop measurement skills and practice art at the same time.

### Conclusion

The basic needs, desires and aspirations of the mentally retarded are the same as those of the non-retarded and science education is very helpful to meet the needs of all children. The movement of mainstreaming is, therefore, in the right direction. Mentally handicapped children develop desirable work habits and learn how to cope with daily life experiences through the study of science. There are advantages in teaching handicapped and normal children together. Having faith in the worth of individuals and accepting the fact that learning can be enjoyable for all children in the same environment, equality of educational opportunity for handicapped children can become a reality.

### Literature Cited

1. Brenton, M. 1974. Mainstreaming the handicapped. *Today's Education* 63:20-5.
2. Cottle, T. J. 1975. Ghetto kids on science and scientist. *Science Digest* 77:54-9.
3. Dailey, R. F. 1971. Me now: life science for the mentally retarded. *Education and Training of Mentally Retarded* 6:130.
4. Doxtad, V. and Shipkowitz, D. 1974. Activities for EMRs. *Instructor* 84:94.
5. Duncan, John. 1943. *The education of the ordinary child*. The Ronald Press Co.
6. Glickman, Jane L. 1975. Research activities for handicapped children. *American Education* 11:30-31.
7. Guerin, G. R. and Szatlocky, K. 1974. Integration programs for the mildly retarded. *Exceptional Child*. 41:173-9.
8. Horn, J. 1975. New help for the handicapped. *Psychology Today* 8:35-36.



9. Russo, J. R. 1975. Are your facilities suitable for mainstreaming the handicapped? *Education Digest* 40:18-21.
10. Sachery, S. D. 1975. Science classes for mentally retarded adults. *Science Teacher* 42:44-46.
11. Sheehy, Eileen. 1975. The special child in the regular classroom. *Clearing House* 49:14-16.
12. Wachtman, M. 1974. Prints and Batik. *School Arts*. 74:43.
13. Wine, Dennis J. 1973. Student activities and the educables. *Clearing House* 47:472-5.

\* \* \* \*

## RESOURCE SURVEY FOR HANDICAPPED STUDENTS

A comprehensive survey of resources in the teaching of science to physically handicapped elementary and secondary level students is being undertaken by the American Association for the Advancement of Science (AAAS) Project on the Handicapped in Science.

The survey effort, supported by the Grant Foundation of New York, will result in two publications, *An Inventory of Experiences: Approaches That Work* and *A Directory of Human Resources*. The *Inventory* will describe projects, publications, and methods, lessons, or materials which teachers have used, developed, or adapted for teaching science to handicapped students. The items described will cover special projects in mainstream settings, resource centers, laboratories, self-contained classes, and residential or day schools, according to educational level, discipline, and handicapping condition. *The Directory of Human Resources* will provide a list of personnel, teachers, supervisors, and others who have experience working with handicapped children and who are willing to share their experience with others.

The two publications will be distributed to state educators, professional associations of science teachers, special education teachers, administrators, teacher educators, and appropriate federal agencies and organizations of and for the handicapped.

Teachers who have had successful experiences in this area or those who can identify such teachers are asked to write Dr. Redden at the AAAS Project on the Handicapped in Science, 19776 Massachusetts Avenue, N.W., Washington, D.C. 20036. The Office will contact all respondents to obtain information for publication in one of the two resource books.

\* \* \* \*

### Equipment for Schools

A new association to match discarded industrial equipment with schools that can use it has been set up. Called the National Association for the Exchange of Industrial Resources, the Chicago-based group receives specific requests for equipment and other resources from member schools and locates the material from member companies, who gain tax advantages by donating the material to educational institutions. The nonprofit association is located at 540 Frontage Road, Northfield, Illinois 60093.