

The Effectiveness of Adapted Instructional Material for the Higher Secondary School Children with Visual Impairment of Teaching Science in the Inclusive Education Program

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Abstract

Education is a process of development which consists of the passage of a human being from infancy to maturity and, the process whereby he/she adapts himself/herself gradually in various ways to his physical, social and spiritual environment. Education is a comprehensive term. Its implication is rich and varied it is, therefore very difficult to give a single meaning to our definition of education. Education was viewed by various persons in various ways and each definition stresses a particular aspect of educative process. Education means both the acquisition of knowledge and experience as well as the development of skills, habits and attitudes which help a person to lead a full and worthwhile life in this world. The objectives of the study were as follows to investigate the effectiveness of adapted instructional material for the children with visual impairment of school children in teaching science in the inclusive education program. The second objective was to study the preparation of adapted instructional materials to teach science for children with visual impairment studying in school children. The researcher found that all the school children's were adopted all the instructional materials in different level and got the input very effectively. The benefactors are higher secondary school children with visual impairment, teachers and the parents.

Keywords: Effectiveness, instructional, visual impairment and teaching science.

Introduction

Education is the key to human development. Education is a fundamental right of every child; Article 26 of United Nations declaration for human rights highlights right to education. Article 45 of constitution of India notes free and compulsory education for children under the age of 14 years. Further Articles 41 emphasized right to education for persons including with disabilities. Under the constitution, persons with disabilities have been guaranteed the Fundamental Rights as available to other citizens of the country viz., equality of opportunity, non-discrimination, no untouchable, freedom of religion, right to the language, script of culture, right franchise, right to

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property, right to enforce fundamental rights, access to education in any education institution, and right to work. Education is the core of equality and empowerment. Though the right to education and to equality of education opportunities is guaranteed by the constitution of India, it is disturbing to find that more than half of the population of children and youth with disabilities are denied these rights and do not receive adequate schooling in appropriate environment. Education of children with special needs is called special education. The unique needs of these children are addressed through this individualized educational plans (IEPs), adaptive equipment's, access, adapted teaching aids and a systematic plan and management of resources are involved in special education. The intervention is developed to elevate the learners achieve self-sufficiency and become independent in their school, home and society. The special education ensures elevation in the quality outcomes than that of the typical classroom education for a child with special needs. Technology, approach, adaptations in curriculum is the keys of education to the children with special needs. The remedial programmed that cater to the individualistic needs can be of great use to them. Teaching methods are modified and conducive climate is set up in mainstream education in most of the developed countries to help these children with special needs are served in regular mainstream education. This may improve social understanding and foster academic achievement.

Literature

Review of related literature involves the systematic identification, location and analysis of documents containing information related to the research problem. Review of related literature was helpful for researcher in assessing inclusive practices; it gave guidelines regarding the tools and techniques as well. Researcher reviewed theory, research articles and doctoral researches that helped him in avoiding repetitions of the work. It also gave a framework for the research. Literature review is the process of reading, analyzing, evaluating, and summarizing scholarly materials about a specific topic. It provides a critical evaluation of the existing literature on a particular topic that is the particular study of the investigator. The literature review is the foundation of the research. It is a vital part of the research process. It provides insight, knowledge and awareness to the present study.

Literature review provides the context for the research, by examining and acknowledging the works of others and allowing the investigator to establish the position of the present study among the various scholarly articles and research done. In the words of Borg, "The literature in any field forms the foundation upon which all future work will be built". The author further observes that if

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we fail to build this foundation of knowledge provided by the review of literature, our work is likely to be shallow and naïve, and will often be duplicate work that has already been done better by someone else. Good has said, “The keys to the vast storehouse of published literature may open doors to sources of significant problems and explanatory hypotheses, and provide helpful orientation for definition of the problem, background for selection of procedure, and comparative data of interpretation of results. In order to be truly creative and original, one must read extensively and critically as stimulus to think”. A systematic procedure has been followed in reviewing the related literature for this study.

Ellson (1960), the principal developer of programmed tutoring, it is a one-to one method of instruction in which the decision to be made by the tutor are programmed in advance by means of carefully structured printed instruction. In a typical programme the tutor and student sit down together to go through the lesson material. The teacher's book has the answers to the exercises, the student's book doesn't. Programmed tutoring uses what might be called 'brightening' as opposed to the 'feeling' or gradual reduction of prompts used in conventional linear programmed instruction. In brightening the item is first presented in a relatively difficult form. If the learner response correctly he or she is reinforced and goes on to a new item. If not, a series of increasingly clear prompts or hints are given. The sequence of prompts would continue until the learner gives an acceptable response. Then reinforcement would be given. The idea is to lead the student toward the solution with brightening hints but to avoid actually giving the correct answer.

King and Szabo (1972) conducted an individualized physics programme at the Boys Town Areas Senior High School to increase Physics enrolment, achievement and interest by shifting the instructional strategies towards increasing degrees of individualization. After the first year of the project, Physics enrolment increased 20 percent. It appears that the project is effective in increasing enrolment, stimulating interest in teaching physics and providing a new degree of individualization for the students of Physics at Boys town.

Bryant (1974) developed a Biology module. The basic text on Biology is chosen and the materials were arranged into various areas or modules, and supplementary materials were added wherever needed. The student formulated his own biology course from the modules. Outlines were prepared for each module, giving the objectives, the topics to be considered, concepts and outcomes anticipated, and noting the chapters in the texts and experiments. Each student is assigned to a biology teacher who becomes his home base teacher for the purpose of records. The student

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remains with his teacher for the first six weeks to study the introductory unit required of all biology students. During these six weeks, the student is given a description of the available modules. He prepares his course of study by choosing the area of special interest to him. The teachers also choose the modules they wish to teach. Reorganizing the available materials into modules and giving the student the opportunity to choose, has been a success with students, biology teachers, counselors, school administrators and parents. Discipline problems and complaints by both teachers and students have disappeared.

Rae (1985) conducted a study on the Development and Evaluation of a Self-Instruction Learning Module for associates of science degree nursing students. The purpose of the study was to determine the effects of self-instruction module and the study employed a non-equivalent control group design with random assignment of intact groups. The sample for this study consisted of 78 associate degree nursing students. Submitting the scores to an analysis of covariance at the 0.05 significant levels revealed that the experimental group performed better on the post-cognitive examination than those taught the exchange system for real planning in a regular medical-surgical nursing class.

Walker (1987) investigated the effectiveness of two different methods of teaching learning disabled middle school students how to solve one step addition and subtraction and mathematical story problems. This study also compared the generalization of the two instructional methods to problems written in syntax that required the performance of two mathematics operations, subtraction and addition.

Bang, Myongye (1992) examined Inclusion of Students with Moderate and Severe Impairment in General Education Classes. According to results the criterion-related validity coefficient of the Instructional Strategy Usage (ISU) instrument was statistically significant. Years of teaching experience of general education teachers was significantly negatively related to their use of instructional strategies that facilitate inclusion of students with moderate and severe impairments in general education classes. General education teachers' training in the field of special education was unrelated to their use of instructional strategies that facilitate inclusion of students with moderate and severe impairments in general education classes. General education teachers' collaboration with special education teachers, including a building principal's support, was significantly positively related to their use of instructional strategies that facilitate inclusion of students with moderate and severe impairments in general education classes. Self- perceived

efficacies of general education teachers were unrelated to their use of instructional strategies that facilitate inclusion of students with moderate and severe impairments in general education classes.

Methodology

The investigator adopts the survey method of research and the survey method is necessary for the collection of facts and information relevant to the problem investigated. The survey approach to educational problems is one of the most commonly used approaches. It goes beyond mere gathering and tabulation of data, it involves interpretation, comparison, measurement, classification, evaluation and generalization, all directed towards a proper understanding and solution of significant educational suggests ways of meeting them. Selection of a particular design is based upon the purposes of the experiment, the type of variables to be manipulated and the conditions under which it is conducted. The design deals with number of subjects are to be selected for experimental group and control group the way variables are manipulated and controlled, the way extraneous variables are to be controlled, how observations are to be made and the type of statistical analysis to be employed in interpreting data relationships. The sample of the study consisted of students of children with visual impairment 8th, 9th and 10th classes studying in the inclusive education programmes and regular teachers working in the inclusive education programme schools in Srikakulam, Vizianagaram and Visakhapatnam districts. A total of 270 children with visual impairment and 120 regular science teachers working in inclusive schools were randomly selected.

Table 1. Sample of Students

Sl.No	School Name	Boys	Girls	Total
1.	ZPHS Gara	20	25	45
2.	GAHS Bandaruvanipeta	18	27	45
3.	ZPHS ampolu	25	20	45
4.	KGHS Calingapatnam	35	10	45
5.	MPPS kummaripeta	15	30	45
6.	GHS Hiramandalam	19	26	45
Total		132	138	270

Table 2. Sample of Science Teachers

Sl.No	School Name	Male	Female	Total
1.	ZPHS Gara	8	12	20

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2.	GAHS Bandaruvanipeta	5	15	20
3.	ZPHS Ampolu	7	13	20
4.	KGHS Calingapatnam	6	14	20
5.	MPPS kummaripeta	12	8	20
6.	GHS Hiramandalam	9	11	20
Total		47	73	120

Findings & Analysis

The first objective is to investigate the effectiveness of adapted instructional material for the children with visual impairment of school children in teaching science in the inclusive education program.

After the quantification of data, various statistical measures such as Means, Standard Deviations. Table 3 Effect of Adapted Instructional Materials of Teaching Science Concepts for Children with Visual Impairment of Inclusive Education

Measurement	Physics	Chemistry	Biology
Sample	270	270	270
Mean	7.34	7.66	8.53
Mean Percent	48.96	51.04	56.84
Std. Deviation	1.11	0.94	1.29
Variance	1.24	0.89	1.66
Minimum	0.00	0.00	0.00
Maximum	15	15	15
Range	5.00	5.00	6.00

As seen from the above table 3 observed that the Children with Visual Impairment secured average achievement in the pre-test of Physics, Chemistry and Biology. The mean and mean percentages are 7.34, 7.66 and 8.53 which are 48.96%, 51.04% and 56.84 respectively of their total score.

The second objective was to study the preparation of adapted instructional materials to teach science for children with visual impairment studying in school children.

Table 4 Subject wise performance of Children with Visual Impairment of school Children with Visual Impairment.

Measurement	Physics	Chemistry	Biology
Sample	270	270	270
Mean	10.48	11.03	11.81
Mean Percent	69.85	73.53	78.72

Std. Deviation	1.32	1.15	1.20
Variance	1.73	1.32	1.45
Minimum	0.00	0.00	0.00
Maximum	15	15	15
Range	7.00	6.00	5.00

Table 4 revealed that the Children with Visual Impairment secured high achievement in the test of Physics, Chemistry and Biology. The mean and mean percentages are 10.48, 11.03 and 11.81 which are 69.85%, 73.53% and 78.72 respectively of their total score and also the Children with Visual Impairment secured high score in the post test of Biology subject comparatively Chemistry and Physics subjects.

Recommendation and Conclusion

Children with Visual Impairment secured average achievement in the pre-test of Physics, Chemistry and Biology Children with Visual Impairment secured high score in the post test of Biology subject comparatively Chemistry and Physics subjects. It was found from teachers that, there is a lack of teaching staff with enough knowledge of meaning and objectives of inclusive education programme. This has been a major challenge to the implementation of inclusive practices among teachers. The Government, therefore, should take measures to provide enough pre-service and in-service training concerning inclusive education to teachers. They should be educated on how to make the classrooms inclusive to learners with special needs, and visual impairments in particular, through adaptations of teaching and learning environments.

Children with Visual Impairment secured high achievement in the post-test of Physics, Chemistry and Biology and also Children with Visual Impairment secured high score in the post test of Biology subject comparatively Chemistry and Physics subjects. The lack of teaching and learning tactile materials for use in inclusive classroom was also mentioned by teachers as the main problem to the implementation of inclusive education. The teachers must be trained in plus curricular activities and the government should provide enough teaching and learning resources to these inclusive schools and to students with visual impairments in particular. Things like models, talking books, printers and photocopiers etc., should be made available. Also, the Government in

collaboration with parents should provide devices like perking's braille, magnifying glasses, lenses etc., to improve teaching and learning of students with visual impairments in inclusive classroom.

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