ISSN 2278-8808
SJIF 2015: 5.403
An International Peer Reviewed & Referred
SCHOLARLY RESEARCH JOURNAL
FOR INTERDISCIPLINARY STUDIES

CRITICAL STUDYON SECONDARY SCHOOL SCIENCE TEXT BOOKSPRESCRIBED BY THE GOVERNMENT OFTELANGANA

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Abstract

Education in its broadest sense is the means through which the aims and habits of a group of people lives on from one generation to the next. Generally it has a formative effect on the way one thinks, feels or acts. It is narrow technical sense; education is a formal process by which society deliberately transmits its accumulated knowledge, skills, customs and values from one generation to another, e.g. instructions in schools. "The textbook is, in fact, the heart of the school and without the ubiquitous text there would be no schools, at least as we know them". Textbook for children are widely recognized as having ideological, educational, socializing and pedagogical implications and objectives. Therefore this is important to understand that text produced and presented in the books. Because, the material produced for the very young children play an important role in reshaping discourse that are already in circulation in the broader social world.The term curriculum used in a number of ways by parents, educators and businesses. Some see curriculum as the "academic stuff that is done to children in school." Teachers themselves use the term in different ways depending on their views and needs. In any school staffroom one may hear statements about curriculum such as the following: "The kids are really making progress since I began modifying the curriculum to better meet their needs." Science is both a body of knowledge that represents current understanding of natural systems and the process whereby that body of knowledge has been established and is being continually extended, refined, and revised. Both elements are essential: one cannot make progress in science without an understanding of both. Likewise, in learning science one must come to understand both the body of knowledge and the process by which this knowledge is established, extended, refined, and revised.

Keywords: *Evaluation, Secondary School, Science Text Book.*

Introduction:

Before one can discuss the teaching and learning of science, consensus is needed about what science is and why it should occupy a place in the grades K-8 curriculum. One must ask: "What is science"? and "Why to teach it"? A consensus answer to these fundamental questions is not easily attained, because science is characterized in different

ways not only by different categories of people interested in it—practitioners, philosophers, historians,educators—but also by people within each of these broad categories. In this chapter, we describe some different characterizations of science and consider implications for what is taught in science classrooms. Although the characterizations share many common features, they vary in the emphasis and priority they place on different aspects of scientific activity, with potential consequences for what is emphasized in science classrooms. We then describe the goals of science education associated with each perspective.

The various perspectives on science—alluded to above and described below—differ mainly with respect to the process of science, rather than its product. The body of knowledge includes specific facts integrated and articulated into highly developed and well-tested theories. These theories, in turn, can explain bodies of data and predict outcomes of experiments. They are also tools for further development of the subject. An important component of science is the knowledge of the limitations of current theories, that is, an understanding of those aspects of a theory that is well tested and hence which is well established, and of those aspects that are not well tested and hence are provisional and likely to be modified as new empirical evidence is acquired.

"The literature", in this context, refers to published scholarly work. For instance, scientific scholarly literature includes journal articles, conference proceedings, technical reports and books. A "literature review" reviews the scholarly literature on a specific topic by summarizing and analyzing published work on that topic. The purpose of a literature review is:

- To evaluate the state of research on a topic.
- To familiarize readers and students with what has already been done in the field.
- To suggest future research directions or gaps in knowledge.

Statement of the Problem:

The researcher has selected the following topic for the present study: *"**An Evaluative Study on Secondary School Science Text Books Prescribed by the Government of the Telangana**"*.

Significance ofthe Present Study:

Education has remained an instrument of change and national development of any country. It is a social process and the medium for the acquisition of relevant knowledge, skills and attitudes for survival in a changing world. The strengthening of democratic institutions witnessed the world over including India and the rapid increase in globalization has become

more prominent in the 21st century. Nations desire closer cooperation, improvement in the quality of life, respect for the rule of law and Human Rights and peaceful co-existence among communities and nations constitute global issues of concern.

Need For the Study

Compulsory teaching of science, as a part of general education up to Class VII or VIII, had been in practice in most of the states and UTs before the introduction of a uniform pattern of school education in 1975. During this period the subject was usually taught as general science in most of the states. However, at the secondary stage science was an optional subject, which was offered either as a combination of physical science and biology or as physics, chemistry and biology. The syllabus of science and textbooks were prescribed by the respective state agencies. The content and process of science teaching in schools, therefore, varied from one state to another.

Objectives of the study:

1. To review the effectiveness of **content selection** of science text books at secondary school level.
2. To examine the effectiveness of **content organization** of science text books at secondary school level.
3. To examine the adequacy of the **content (Subject)** and practical to match the understanding level of the pupil.
4. To examine the practice of the **content exercise** of science text books at secondary school level.
5. To examine the utility of **Teaching Learning Aids** at secondary school level science text books.
6. To examine whether the present science text books information and designing is in accordance with the objectives of **National Policy on Education, 1986.**

Hypotheses of the Study:

1. There is no significance difference between the Teachers towards science text books in respect of **content selection**
2. There is no significance difference between the Teachers towards science text books in respect of **content organization**.
3. There is no significance difference between the Teachers towards science text books in respect of **content (Subject)**.

4. There is no significance difference between the Teachers towards science text books in respect of **content exercise.**
5. There is no significance difference between the Teachers towards science text books in respect of **Teaching Learning Aids.**
6. There may not be any significant differences in the Concepts of the syllabus preparation in accordance with the principles of **National Policy on Education, 1986** with respect to secondary school science text books.

Need for the Study:

In India, systematic and sustained research is lacking in the field of science in general and science textbooks in particular. Science is one of the human activities that man has created to gratify certain human needs and desires. But science was given a step – motherly treatment was considered to be a less challenging subject for study in the olden days. But its importance was recognized since the beginning of the present century and was made a subject of the school curriculum. Since then no specific and constructive studies were undertaken over the science discipline at secondary level. Research studies on science textbooks or evaluative studies on Science textbooks of Secondary level have not conducted more effectively. It is not out of place to mention that a science textbook is the most reliable source of information. A good textbook can be of great help to both the teachers and students. Therefore, there is a dearth need to find out the effectiveness of present secondary school science textbooks in the interest of teachers, students and science discipline itself.

Tools Description:

For the purpose of the present study, the investigator has constructed and administered the tools among the selected respondents.

To obtain the opinionnaire from the respondents i.e., Physical Science Teachers, a questionnaire was designed and constructed by the investigator consist of 44 items. This questionnaire was devised into five areas viz., Content Selection (1 to 10 items), Content Organization (11 to 18 items), Content (Subject) (19 to 28 items), Content Exercise (29 to 36 items) and Teaching Learning Aids (37 to 44 items). Apart from this 03 open-ended statements were included to respond accordingly. The responses were consider as suggestions for further studies also.

To measure the Teachers' opinionnaire, Likert type 5-point scale was adopted viz., Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (DA) and Strongly Disagree (SDA). The weightage was given in respect of positive items SA-1, A-2, UD-3, DA-4 and

SDA-5 and the weightage was given 5 to 1 in respect of negative items. Hence, the total score will be in between 44 – 220.

In respect of measuring the Pupils' Understanding level towards Physical Science Textbooks, a questionnaire was designed with 44 selected items, which were taken from the Physical Science Textbooks of VII to X Classes. All the items covering the syllabi of VII to X Classes were included with the help of Senior Teacher Educators, Subject experts and Senior Teachers.

Sample:

The sample selected for the investigation consists of Physical Science Teachers of Secondary Schools covering Hyderabad, Ranga Reddy, Medak and Mahaboobnagar Districts affiliated to the Board of Secondary Schools of Telangana State. Simple Random sampling technique is followed to draw the sample for the present study. In the present study the variable like – Gender(Sex) (Male and Female), Locality (Rural and Urban), Type of Management (Government and Private), Medium of Instruction (English, Telugu and Urdu), Experience (Below 10 years' experience and above 10 years' experience), General qualification (Graduate and Post-Graduate) Professional Qualifications (B.Ed., and M.Ed.) are taken into consideration.

The investigator is designed to administer the tools among the Physical Science Teachers working in selected Secondary Schools under Government and Private Organizations in Rural and Urban areas situated in Hyderabad, Ranga Reddy, Mahabubnagar, Nalgonda and Medhek Districts of Telangana.

Collection of Data:

The Investigator has decided to administer the Research tool personally to the selected Physical Science Teachers. The tool viz., "An Evaluative Study on Secondary School Science Textbooks prescribed by the Government of Telangana" is proposed to administer among the selected Secondary School Physical Teachers situated in Hyderabad, Ranga Reddy, Mahaboobnagar Nalgonda and Medhek Districts.

Limitations:

This study is limited only to the Physical Science Teachers working in different Management Schools of part of Telangana region (i.e., Hyderabad, Ranga Reddy, Mahaboobnagar, Nalgonda and Medhak Districts) of Telangana affiliated to State Board of Secondary Education.

To measure the tool of "An Evaluative Study of Secondary School Science Textbooks" the independent variables like Sex (Male and Female), Locality (Rural and

Urban), Type of Management (Government and Private), Medium of Instruction (English, Telugu and Urdu Medium), Experience (Below 10 years' experience and above 10 years' experience), General qualification (Graduate and Post-Graduate) Professional Qualifications (B.Ed., and M.Ed.) were taken into consideration.

Research Methods:

Method and methodology are not considered the same in educational research. Methodology refers to the research paradigm that guides the whole research project while method refers to the technique employed in obtaining and interpreting data.

Sampling Procedure:

Showing distribution of samples

Sl. No.	Variable		Frequency	Percent	Total
1.	Gender	Male	322	64.4	500
		Female	178	35.6	
2.	Age	Below 30 years	168	33.6	500
		31-45 years	303	60.6	
		Above 45 years	29	5.8	
3.	Experience	Upto 10 years `	382	76.4	500
		11-20 years	112	22.4	
		Above 20 years	8	1.2	
4.	Management	Private	104	21.0	500
		Government	395	79.0	
5.	Habitat	Rural	315	63.0	500
		Urban	185	37.0	
6.	Medium of schools	Telugu	307	61.4	500
		English	122	24.4	
		Urdu	71	14.2	
7.	General Education	Graduation	293	58.6	500
		Post-graduation	207	41.4	
8.	Professional qualification	Graduation	477	95.4	500
		Post-graduation	23	4.6	
9.	District	Hyderabad	45	9.0	500
		Mahabubnagar	203	40.6	
		Medak	60	12.0	
		Nalgonda	77	15.4	
		Ranga Reddy	115	23.0	

Collection of Data:

The researcher personally visited the schools in Hyderabad, Mahabubnagar, Medak, Nalgonda and Ranga Reddy district and explained the teachers to give their opinions with regard to five main areas on secondary school science text books prescribed by the government of Telangana. They were also given sufficient time to prepare them mark their responses. Confidentiality of the data was assured to use for the research purpose only.

Statistical Techniques Used:

The data was collected and analysed by using descriptive statistical techniques like mean, standard deviation, and inferential statistics, like chi-square, ANOVA and correlations. For analysing the data the SPSS package 17th version has been utilised.

1. Means and Standard Deviations were calculated for scores of the entire sample with respect to all variables.
2. . 'Analysis of Variance' (ANOVA) was applied to test whether there is any significant differences exists among students in their performance in geometry with respect to independent variables such as Gender and medium. However for all the factors including the cases more than two such as type of management ANOVA is used. The student t-test could also have been used for the cases of only two groups like gender but both t-test and F-test would give the same result because the square of the t-statistic is F-statistic.
3. To categorize the respondents into low, moderate and high level, in their satisfaction levels researcher followed the procedure of categorization of a normally distributed characteristic data as suggested by Garrett (Garrett, 1971).

Findings:

Content Selection

1. It was found that there is a significant difference (t=2.804; p=0.005) between male and female teachers' opinions. The mean scores of male and female teachers are 32.92 and 30.98 respectively with regard to their opinions.

2. It was found that there is a high significant difference (F=5.507; p=0.004) in the opinions among different age group of teachers'. The mean scores are 30.71 (< 30 years) 32.92 (31-45 years) and 33.76 (>45 years).

Content Organization

1. It was found that there is a significant difference (t=2.390; p=0.017) between male and female teachers' opinions. The mean scores of male and female teachers are 25.35 and 25.01 respectively with regard to their opinions.

2. It was found that there is a high significant difference (F=5.008; p=0.006) in the opinions among different age group of teachers'. The mean scores are 24.68 (< 30 years) 26.44 (31-45 years) and 26.93 (>45 years).

Content (Subject)

1. It was found that there is a significant difference (t=2.316; p=0.021) between male and female teachers' opinions. The mean scores of male and female teachers are 34.88 and 33.43 respectively with regard to their opinions.
2. It was found that there is no significant difference (F=1.603; p=0.202) in the opinions among different age group of teachers'. The mean scores are 33.61 (< 30 years) 34.72 (31-45 years) and 34.97 (>45 years).

Content Exercise:

1. It was found that there is no significant difference (t=1.494; p=0.136) between male and female teachers' opinions. The mean scores of male and female teachers are 29.35 and 28.50 respectively with regard to their opinions.
2. It was found that there is no significant difference (F=2.470; p=0.086) in the opinions among different age group of teachers'. The mean scores are 28.26 (< 30 years), 29.36 (31-45 years) and 30.31 (>45 years).
3. It was found that there is a high significant difference (F=6.721; p=0.001) in the opinions among different experience of teachers'. The mean scores of the teachers on the basis of experience are 28.58 (up to 10 years), 30.79 (11-20 years) and 25.83 (>20 years).

Teaching Learning Aids:

1. It was found that there is no significant difference (t=1.866; p=0.063) between male and female teachers' opinions. The mean scores of male and female teachers are 25.62 and 24.78 respectively with regard to their opinions.
2. It was found that there is no significant difference (F=2.975; p=0.052) in the opinions among different age group of teachers'. The mean scores are 24.89 (< 30 years), 25.70 (31-45 years) and 23.86 (>45 years).
3. It was found that there is no high significant difference (F=0.825; p=0.439) in the opinions among different experience of teachers'. The mean scores of the teachers on the basis of experience are 25.18 (up to 10 years), 25.83 (11-20 years) and 24.83 (>20 years).

All Dimensions

1. It was found that there is a significant difference (t=2.720; p=0.007) between male and female teachers' opinions. The mean scores of male and female teachers are 149.12 and 142.70 respectively with regard to their opinions.

2. It was found that there is a significant difference (F=4.366; p=0.013) in the opinions among different age group of teachers'. The mean scores are 142.15 (< 30 years), 149.15 (31-45 years) and 149.83 (>45 years).
3. It was found that there is a high significant difference (F=13.291; p=0.000) in the opinions among different experience of the teachers. The mean scores of the teachers on the basis of experience are 143.75 (up to 10 years), 157.48 (11-20 years) and 144.50 (>20 years).

Implications of the Study:

The study has offered to investigate phenomenon and indeed illustrated the profound implication that post-use evaluation can have on the teaching and learning science subjects.

1.Contribute to the science by conducting a post-use evaluation empirical study, which to date, is heavily under researcher.

2. Add onto the existing science themes in textbook evaluation by introduction a framework as to how pedagogical fitness of textbook content with prescribed curriculum requirements can be examined systematically.

3. Provide an evaluation framework allowing for timely, collaborative and systematic elicitation of strengths and weakness of a textbook, thereby fostering efficient decision making regarding the use and choice of teaching material.

4. Expand the range of users of post-use textbook evaluation framework from traditionally focused on teachers, to official policy makers, stakeholders and curriculum developers.

5.Expand the function of textbook evaluation framework primarily for evaluation purposes to a devise for teacher development.

Further Research Work:

1. It is necessary to implement a larger size selection in future research.
2. The present study has conducted using teachers' samples only, but it is better if one collect the data from the sample of policy makers, subject experts, university professors, higher officials and publishers for better understanding of the theme.
3. The study is restricted only physical science subject; it may be extended to other subjects also.
4. The study is restricted only Telangana State science (curriculum) syllabus, it may be extended to CBSE (central and ICSE syllabus (curriculum or text books).
5. The study is confined to only 5 districts of Telangana state; it may be include other districts.

Conclusion:

The whole presentation with a special reference to the chapter covering the results and discussions will help in arriving at the results in concise that facilitates in drawing the broad conclusions. The results reveal that there is a significant difference between the opinions of male and female teachers, different age groups, experience, management of the institution, locality of teachers where there are working, medium of teaching and teachers' their own district, whereas there is no significant difference between general graduate and post-graduate teachers as well as professional graduate teachers and professional post-graduate teachers. The mean scores of male teachers are higher when compared with the female teachers in content selection. From these results it can be concluded that the male teachers' involvement in science subject is more than the female teachers. When compared the mean values of the age groups of teachers there is an increase in the opinion scores while increasing the age, here it can be said that the age influencing the opinions of teachers on content selection.

With regard to the experience, the teachers' opinions are higher in the age group of 11-20 years (middle group) than other groups i.e., up to 10 years (lower group) and above 20 years (higher group). From this it can be concluded that the middle age group teachers are higher opinions than low group teachers and high group teachers. Because the teachers who have less experience has less understanding on content selection, whereas the experienced teachers, who have more than 20 years, expecting more content selection to meet the students requirement. The mean scores of government teachers are higher than the private teachers. This is due to the government conducts orientation programmes to their teachers every year on text books. On the basis of the teachers' habitat, the opinions of rural teachers are higher when compared to urban teachers. This is mainly the teachers who are working in rural secondary schools have more attachment with the student and also practical exposure. District-wise mean scores reveals that the Ranga Reddy district teachers' opinions are higher than the other district teachers. This is due to the teachers working in Ranga Reddy district consists various types of teachers.

References:

Afzaal Hussain, Ashiq Hussain Dogar, Muhammad Azeem and Azra Shakoor (2011), "Evaluation of Curriculum Development Process", International Journal of Humanities and Social Science, Vol.1, No.14, pp.263-271.

Agrawal S.S. and Madhuri P. Khobragade (2013), "A Study of Critical Evaluation of CBSE Science Text Book of Class IX", Indian Journal of Experimental and Innovation in Education", Vol.2, Issue 5, ISSN: 2278 1730.

Aikenhead, G S (1996), "Science education: border crossing into the subculture of science", Studies in Science Education, vol.27, pp.1-52.

Aikenhead, G.S. (2003), "STS education: A rose by any other name". In R. Cross (Ed.), A vision for science education: Responding to the work of Peter Fensham. New York: Routledge Falmer, pp.59-75.

Ajaja O. Patrick (2009), "Evaluation of Science Teaching in Secondary Schools in Delta State 2 - Teaching of the Sciences", Int J Edu Sci, vol.1(2): 119-129.

Ajzen, I (1984) in Wiley Encyclopedia of Psychology (ed. Corsini, R. J.) 99-100, Wiley, New York.

Ball, D.L., & Cohen, D.K. (1996), "Reform by the book: What is--or might be--the role of curriculum materials in teacher learning and instructional reform?", Educational Researcher, vol.25(9), pp.6-8, 14.

Black, P. and Wiliam, D. (1998), "Assessment and Classroom learning", Assessment in Education vol.5 (1), pp.7-73.