STATUS OF SCIENCE EDUCATION AT ELEMENTARY LEVEL IN ARUNACHAL PRADESH: A CRITICAL STUDY

[1]RIGGON NYICYOR [2]MR. JADAB DUTTA

[1&2]Research Scholars, Deptt. of Education, Rajiv Gandhi University, Rono Hills, Doimukh, A.P, India

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ABSTRACT

Science is a human Endeavor. Within 150 years, science education has influenced human society to a large extent and still bringing changes. Science is growing rapidly through research and all the research findings are serving as base of technology. In this paper we study the growth and development of Science Education, curriculum, the physical infrastructure, to identify various problemsof Science Teachers in teaching, academic performance of Elementary School learners, attitudes of Elementary Science Teachers and Students and to suggest measures for effective Science Education at Elementary level in Arunachal Pradesh.

Keywords: Science, Growth and Development, Curriculum, Physical infrastructure, Academic performance, School learners, Attitudes and Elementary level.

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INTRODUCTION:

Every citizen of the present modern world sees the countless manifestations of science all around him. There is no aspect of man's life today which has not been influenced by science one way or the other. This is because we live in an age of scientific culture. Science has shrunk the world and totally changed the human outlook. Infact, science now has all-pervading influence on every sphere of human activity. Further, modern science is no longer confined to the surface of this globe, its sphere of achievements reached beyond the earth.

There has been, in recent times, rapid addition of knowledge to the world of science. Great achievements of science and technology and the use of these scientific achievements in promoting the well-being of mankind though their application in the field of Industry, Communication, Transport, Engineering, Agriculture and Medicine have made science more important than ever before. Science has, infact, radically transformed the material environment

of the citizens of modern world; and, off course, it has its significant role in promoting culture and spiritualism either directly or indirectly.

The scope of science education varied greatly from one country to another, with more or less emphasis placed on scientific content, methods, tools or values. China for instance distinguished among six different domains in science teaching, i.e. the knowledge domain (ability to master important facts, major concepts and principles of science); the operational skills domain (ability to use apparatus and instruments); the scientific process skills domain (ability to observe, measure, group, question, formulate hypotheses and experiment); the application domain (ability to apply concepts and skills in new situations); the creative domains (ability to formulate questions and to give explanations and new ideas); the attitude domain (ability to develop a positive feeling towards science and studying science).

OBJECTIVES OF THE STUDY:

The main objectives of the study are as under:

(1) To Study the growth and development of Science Education at Elementary School stage in Arunachal Pradesh.

(2) To study the curriculum of Science Education at Elementary School stage in Arunachal Pradesh.

(3) To investigate the physical infrastructure of Elementary Schools in relation to teaching and learning of Science at Elementary School stage in Arunachal Pradesh.

(4) To identify problems of Science Teachers in teaching Science at Elementary level.

(5) To analyze the academic performance of Elementary School learners in Science relating to some non-cognitive variables.

(6) To study attitudes of Elementary Science Teachers and Students towards Science Education.

(7) To suggest measures for effective Science Education at Elementary level in Arunachal Pradesh.

HYPOTHESES OF THE STUDY:

The investigator sets the following hypotheses in view of the above stated objectives of the study for testing on the basis of valid and reliable evidences:

(i) There is no significant influence of Settlements, Sex and Race on the performance of Elementary school stage Students in science.

(ii) There is no significant difference between the attitude mean scores of elementary school science teachers belonging to Rural and Urban schools towards Science Education in Arunachal Pradesh.

(iii) There is no significant difference between the attitude mean scores of Male and Female elementary school science teachers towards Science Education in Arunachal Pradesh.

(iv) There is no significant difference between the attitudes mean scores of Tribal and Non-Tribal elementary school science teachers towards Science Education in Arunachal Pradesh.

METHODOLOGY:

The nature of the present study reveals that it is neither historical nor experimental in nature rather it is descriptive study based on some empirical data collected from the field. The present study is an effort to study the status of elementary science education of Arunachal Pradesh. It highlights the prevailing conditions of elementary science education of Arunachal Pradesh. Hence, the investigator has adopted the descriptive–cm–normative survey method of educational research for the completion of this study. The main components of the methodology are stated as under:

(i). Selection of Sample

(ii). Selection of Tools

(iii). Administration of Tools and scoring

(iv). Organization and Tabulation of Data.

(i) Selection of Sample

It is well known fact that the collection of data from the whole population is a difficult proposition. All the individuals/units/items of an investigation in any field of inquiry constitute the universe or population of the study. The population of the present research study includes all the elementary schools of Lower Dibang Valley, Lohit, West Kameng and Lower Subansiri district of Arunachal Pradesh. Further, the study is also related to various issues, conditions, resources, support, attitude and problems of elementary school science teachers, therefore, all the elementary science teachers of those four districts have been considered the population of this study. The study is also related to the academic performance of 8th grade learners of Lower Dibang Valley, Lohit, West Kameng and Lower Subansiri district of Arunachal Pradesh. Hence, all those 8th grade learners have been considered as a population of the study. From these populations, the investigator selected a sample of 101 elementary schools from Lower Dibang Valley, Lohit, West Kameng and Lower Subansiri district of Arunachal Pradesh by adopting the random sampling technique. From these schools, a sample of 175 teachers has also been drawn by making use of random sampling technique. For having analytical view of academic achievement of students at elementary level a sample of 2400 learners of 8th grade was also selected by adopting the random sampling technique.

(ii). Selection of Tools

The selection of tools in any research study may be considered an important segment because the authenticity of study depends upon the data and the data depend upon the accuracy of the tools. Therefore, the investigator constructed and used the following tools for collection of required data:

1. Questionnaire for science teacher teaching at elementary level for identification of their problems and for collection of information related to teaching-learning process, curriculum, physical infrastructure etc.

2. Questionnaire for elementary school students for collection of information regarding teaching-learning process of science, infrastructure, family environment, personal problems and school administration etc.

3. Attitude scale to measure the attitude of elementary science teachers towards elementary science education;

4. Achievement Test for 8th grade students to measure academic performance of students in science.

(iii). Administration of Tools and Scoring Work

It is understood that the quality of research depends upon the selection and preparation of tools to be used to collect data from various sources. The researcher has taken every care while selection and preparation of tools for this research work. The researcher was careful about the reliability, validity, objectivity and tractability of all the tools involved in this research study. But, after selecting the tools, the research work also depends upon the careful administration of the tools too. The researcher planned the administration of tools phase-wise to the selected population of the study;

Phase – I: Administration of tools on Elementary School Students and Teachers of Lower Dibang Valley District of Arunachal Pradesh

The research scholar visited the selected elementary schools of Lower Dibang Valley District of Arunachal Pradesh for collecting data from teachers and students by administering various tools such as questionnaire and attitude scale to teachers and questionnaire and achievement test to students.

Phase – II: Administration of tools on Elementary School Students and Teachers of Lohit District of Arunachal Pradesh

After visiting the randomly selected elementary schools of Lower Dibang Valley District of Arunachal Pradesh, the researcher visited the randomly selected elementary schools of Lohit District of Arunachal Pradesh for collecting data from teachers and students by administering various tools such as questionnaire and attitude scale to teachers and questionnaire and achievement test to students.

Phase – III: Administration of tools on Elementary School Students and Teachers of West Kameng District of Arunachal Pradesh

After collection of data from Lower Dibang Valley and Lohit districts of Arunachal Pradesh, research scholar visited West Kameng district for collecting data from teachers and students of elementary schools by administering various tools such as questionnaires and attitude scale to teachers and questionnaires and achievement test to students.

Phase – IV: Administration of tools on Elementary School Students and Teachers of Lower Subansiri District of Arunachal Pradesh

Finally, research scholar administered tools to the elementary science teachers and students of Lower Subansiri district of Arunachal Pradesh to collect required relevant data from selected elementary schools of the district.

MAIN FINDINGS OF THE STUDY:

Major findings of the study are stated as under:

Growth and development of inputs of science education at elementary stage in Arunachal Pradesh since inception of SSA

1. The inputs of science education at elementary stage have been consistently improving. Number of elementary schools has been increasing as there were 475 Upper Primary Schools in Arunachal Pradesh in the year 2004-05 which has been increased to1171 in the year 2011-12. It

is nearly 2.5 times increase in the number of elementary schools during the 8 years of SSA scheme in Arunachal Pradesh.

2. The number of science teachers at elementary stage has also been significantly increased from 391 in the year2004-05 to 922 in the year 2011-12. This increase of science teachers is nearly 2.4 times during the 8 years of SSA scheme in Arunachal Pradesh.

3. The Science Teacher Pupil Ratio has been fairly improving from 1: 44 in 2004-05 to 1: 27 in 2011-12.

Teaching of science:

4. It also found that 8% science teachers of Lower Dibang Valley, 3% of Lohit, 3% of West Kameng and 2% of Lower Subansiri have clear concept of Bloom's Taxonomy of educational objectives.

5. It also found that 11% of elementary science teachers of Lower Dibang Valley, 2% of Lohit, 3% of West Kameng and 3% of Lower Subansiri responded correctly about the phases of teaching. It indicates that only 5 percent elementary science teachers are clear about the concept of Phases of Teaching.

6. It also found that 8% of elementary science teachers of Lower Dibang Valley, 3% of Lohit, 2% of West Kameng and 1% of Lower Subansiri responded correctly about the levels of teaching. It indicates that only 4 percent elementary science teachers are clear about the concept of levels of Teaching.

7. It also found that 9% of elementary science teachers of Lower Dibang Valley, 2% of Lohit, 3% of West Kameng and 2% of Lower Subansiri have the idea of different skills of science teaching. It indicates that only 4 percent elementary science teachers in average can apply major skills of science teaching in classroom transaction.

8. It is found that 7% of elementary science teachers of Lower Dibang Valley, 2% of Lohit, 1% of West Kameng and 1% of Lower Subansiri have responded correctly about the different Approaches of science Teaching and can apply in their classroom teaching.

9. It is found that 10% of elementary science teachers of Lower Dibang Valley, 8% of Lohit, 9% of West Kameng and 9% of Lower Subansiri have the clear idea of Innovative methods of science Teaching and can apply in their classroom teaching encounters.

10. It is found that 31% of elementary science teachers of Lower Dibang Valley, 26% of Lohit, 23% of West Kameng and 20% of Lower Subansiri responded correctly about the concept of Continuous comprehensive evaluation of science.

11. It is found that only 8% of elementary science teachers of Lower Dibang Valley, 6% of Lohit, 3% of West Kameng and 4% of Lower Subansiri are able to use educational technology in teaching science.

12. It is indicate that only 17% of elementary science teachers of Lower Dibang Valley, 21% of Lohit, 16% of West Kameng and 17% of Lower Subansiri organize activities while teaching science.

13. It is indicate that only 18% of elementary science teachers of Lower Dibang Valley, 7% of Lohit, 8% of West Kameng and 9% of Lower Subansiri use community resource in teaching science.

14. It is indicate that only 9% of elementary science teachers of Lower Dibang Valley, 6% of Lohit, 7% of West Kameng and 4% of Lower Subansiri have the idea of action research.

15. It also indicate that only 12% of elementary science teachers of Lower Dibang Valley, 9% of Lohit, 10% of West Kameng and 11% of Lower Subansiri improvise their teaching aids as per need.

Learning of science:

16. It also indicate that 68% students of 8th standard of Lower Dibang Valley, 57% of Lohit, 62% of West Kameng and 49% of Lower Subansiri responded that they like their science teacher most. It means they were happy and satisfied with their science teachers.

17. It also indicate that 42% students of 8th standard of Lower Dibang Valley, 45% of Lohit, 47% of West Kameng and 51% of Lower Subansiri responded that their science teachers are the most sincere and friendly while performing teaching activities.

18. It also indicate that 21% students of 8th standard of Lower Dibang Valley, 26% of Lohit, 17% of West Kameng and 19% of Lower Subansiri responded that their science teacher conducts activities to demonstrate concepts of science.

School Environment for learning of Science:

19. It also indicate that 62% students of 8th standard of Lower Dibang Valley, 55% of Lohit, 50% of West Kameng and 55% of Lower Subansiri responded that their Headmaster supervise classroom activity daily.

20. It also indicate that 26% students of 8th standard of Lower Dibang Valley, 31% of Lohit, 30% of West Kameng and 29% of Lower Subansiri responded that their Headmaster invites students to share academic problems.

21. It also indicate that 40% students of 8th standard of Lower Dibang Valley, 45% of Lohit, 43% of West Kameng and 51% of Lower Subansiri responded that their science Teacher encourages students' participation in classroom activities.

22. It also indicate that 70% students of 8th standard of Lower Dibang Valley, 65% of Lohit, 60% of West Kameng and 71% of Lower Subansiri responded that they have Healthy competition among peers.

23. It also indicate that 47% students of 8th standard of Lower Dibang Valley, 62% of Lohit, 41% of West Kameng and 42% of Lower Subansiri agreed that school distance is manageable.

Home environment for studies:

24. It indicates that 70% students of 8th standard of Lower Dibang Valley, 65% of Lohit, 55% of West Kameng and 79% of Lower Subansiri responded that they get peaceful study time at their home.

25. It indicate that 45% students of 8th standard of Lower Dibang Valley, 65% of Lohit, 69% of West Kameng and 59% of Lower Subansiri responded that they live in neighborhood mutual care.

26. It indicate that 71% students of 8th standard of Lower Dibang Valley, 78% of Lohit, 73% of West Kameng and 69% of Lower Subansiri responded that their Family economic conditions are manageable.

27. It indicate that 40% students of 8th standard of Lower Dibang Valley, 38% of Lohit, 41% of West Kameng and 39% of Lower Subansiri responded that their Parents take care for their studies.

28. It indicate that 59% students of 8th standard of Lower Dibang Valley, 61% of Lohit, 69% of West Kameng and 70% of Lower Subansiri responded that they have good health status for studies.

29. 1t indicate that 21% students of 8th standard of Lower Dibang Valley, 30% of Lohit, 31% of West Kameng and 21% of Lower Subansiri responded that their Parents come to school to attend Parent-Teacher meets.

Influence of Sex on academic achievement in science-

The computed t-value (4.36) came out to be greater than the criterion t-value (2.58) at .01 level of confidence for 2398 df. As the computed t-value (4.36) is significant at .01 level, therefore the hypothesis: "there is no significant influence of Sex and their interactions on the performance of Elementary school stage Students in science" gets rejected. From this it is understood that there is significant influence of the sex variable on the performance of the Male and Female elementary students in the achievement scores of science. Also indicates that the overall achievement mean score (44.1) of Female Elementary school students of 8th standard in science is greater than the overall achievement mean score (41.47) of the Male Elementary school students in science of the Lower Dibang Valley, Lohit, West Kameng and Lower Subansiri Districts of Arunachal Pradesh. It means that the Female students of Elementary school in these four districts of Arunachal Pradesh performed better in the achievement test in science than the Male students of these elementary schools in the same test of science.

Influence of Race on academic achievement in science-

It is found that the computed t-value (1.04) came out to be lesser than the criterion t-value (1.96) at .05 level of confidence for 2398 df. As the computed t-value (1.04) is not significant at .05 level, therefore the hypothesis: "there is no significant influence of Race and their interactions on the performance of Elementary school stage Students in science" gets retained. From this it is understood that there is no significant influence of the Race variable on the performance of Tribal and Non-Tribal elementary students in the achievement scores of science. Also indicates that the overall achievement mean score (43.00) of Non-Tribal Elementary school students of 8th standard in science is not considerably greater than the overall achievement mean score (42.33) of the Tribal Elementary school students in science of the Lower Dibang Valley, Lohit, West Kameng and Lower Subansiri Districts of Arunachal Pradesh. It means that the Tribal and Non-

Tribal 8th standard students of elementary schools of these four districts of Arunachal Pradesh performed almost similar in the achievement test of science.

Overall academic achievement of 8th grade learners of Lower Dibang Valley District in science-

It has been for computing the achievements mean score of 600 8th grade learners in science and the computed achievement mean score in science came out to be 37.25 which is a very low score. It means the 8th grade learners have been found poor in the learning of science at elementary stage. Further indicates that 55.28 % 8th grade learners fall below the academic achievement mean score (37.25) in science and only 44.7% 8th grade learners were found above the mean score (37.25). It means the majority of learners are below average and only a small section of students are above the average score and the average score (37.25) itself is not satisfactory at all. It has been observed that only (1.6%) 8th grade learners secure more than 60% marks in science and 98.4% learners were found below 60% marks in science. Finally it is concluded that the 8th learners performed poorly in the achievement test of science.

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