

Awareness On Science Curriculum And Its Dimensions Among High School Teachers

Dr. R. Boopathi

Assistant Professor Department of Educational Technology
Tamil Nadu Teachers Education University Chennai – 600 097.
Email:boopathilara@gmail.com

Abstract

Awareness refers to both concern and educated interest in a certain condition or development. In this study, high school teachers' understanding of "Science Curriculum and its Dimensions" is the focus. The probability sampling approach and the normative survey methodology were used. 96 government high school teachers from fifteen community education blocks in the Namakkal district of Tamilnadu were chosen at random by the investigator to serve as samples for data gathering. Knowledge of scientific curricula and its aspects has been chosen as the primary study variable.

The investigator used the tool in a face-to-face setting after getting prior approval from the heads of the block and school. The completed instruments were gathered from the participants and graded using the scoring guide. The entire scores were tallied and statistical analysis was performed. The results indicate that, when it comes to the scientific curriculum, postgraduate qualified high school teachers have a mean value that is higher than that of undergraduate qualified high school teachers in terms of understanding of teaching, learning, and resources.

Key Words: Awareness, Science Curriculum, High School Teachers

Introduction: Theoretical Base of Research

When children enter the upper primary school, they are exposed to "science" for the first time. It is important to set a proper example for what it means to "do science" at home at this time. The elementary stage's environmental studies should be gradually transitioned to components of science and technology in scientific education at this point. The selection of

scientific concepts for instruction at this level should aim to explain common experiences. It is not required to use a strictly inductive approach, even if the majority of concepts should be developed through activities and experiments. Experience has shown that experiment-based science teaching is possible and viable under diverse conditions and with a very reasonable demand on resources.

Every child who attends eight years of school should be eligible to enter Class IX. The examinations should assess the child's practical and problem solving skills, ability to analyse data; application of knowledge learnt; understanding of concepts; understanding, reading and making graphical representations; and solving simple numerical exercises through skits and plays are an important part of the pedagogy to ensure larger participation and sharing of learning outcomes. Biographical narratives of scientists and inventors are a useful practice to inspire students at this stage. The emphasis on the process skills of science should continue through the upper primary stage to enable children learn how to learn for themselves so that they could carry on learning to even beyond school.

Science Curriculum

A scientific curriculum is an effort to convey the key ideas and characteristics of a discipline in a way that can be effectively applied in the real world and is subject to critical examination. It includes the approach and content as well as the review process. The current scientific curriculum used in the Tamilnadu schools under investigation was put into place at the secondary level in 2010. The new syllabus was created with the NPE-2005 curriculum suggestion in mind, which mandated that the goal of science courses be the development of scientific literacy.

Investigating how the recently introduced science curriculum appeared in classrooms and schools, teachers' perspectives and their comprehension of the meaning of scientific literacy, the resources and textbook support offered for the curriculum's continuation, and the methods of assessment used were all of interest. Thus, the researcher planned to conduct a study on high school teachers' awareness of science curriculum and its dimensions.

Research Gap from Previous Studies

Jaiswal (2010) discovered a noteworthy variation in the attitudes of male and female teachers towards this curriculum

evaluation approach. According to Sanjeev Sonawan & Madhuri Isave (2012), instructors were not given their own assessment instrument, there was a lack of daily record keeping and daily feedback, and the CCE process was stressful for them. Formative feedback was also not given.

According to research conducted in 2012 by Vincent De Paul, S., Thangarasu, S., & G. Murugan, there is no statistically significant difference in mean achievement in the taught courses between the teacher trainees in Pudukkottai District based on their age. This includes courses that celebrate and enhance learning, such as teaching Tamil, mathematics, science, social science, and combined subjects. According to Kauts, D.S., & Kaur, V. (2013), there is a discernible difference in how rural and urban school teachers are perceived in terms of their performance as teachers, the curriculum, discipline, student support system, and admissions requirements.

According to Rathy G.A. (2013), of the lower order skills in the Power Electronics Curriculum, 75% were learned, whereas just 42% of the higher order abilities were. Yadu & Kiran Kumar (2015) found that there were obstacles to the efficient implementation of CCE in schools, including teachers' lack of preparation and an increase in workload.

According to research by Yadav Amit & Jabir Ali (2016), parents who are older, work as farmers, and own more than three acres of land have a favourable opinion of the subject being taught in the classroom. Marshall & Karen (2018) demonstrated that a resilience continuum for year 8 (ages 12–13) could be identified, along with examples of the teacher's scaffolding in science lessons to foster resilience and a visual toolkit to remind students how to recognise different types of resilient behaviour.

A competency-based curriculum approach is most effective in the informal sector when the targeted learners are actively involved in its conception and development, according to research by Ramasamy, Muthuveeran, Pilz, & Matthias (2019). The difficulties of providing excellent science experiences in the classroom while still satisfying the variety of curricular requirements were discussed by Davey and Jemima in 2021. The investigator was very encouraged to investigate high school teachers' understanding of the science curriculum and its aspects based on demographic variables such educational degree, after reading the perspectives given in the Indian research mentioned above.

Rationale of the Study

In the modern academic sphere, curriculum is important and has a key position in every educational system. Education institutions are obliged to employ a range of approaches in the execution of any curriculum so that students can be exposed to a diverse range of learning experiences. These consist of talks, workshops, assignments, experiments, field excursions, and projects. However, there is no guarantee that using these strategies will always provide the intended outcomes.

Examining the various facets of curriculum evaluation reveals that it must address issues like the scope of the goals, the degree to which these goals are met, the relevance of curriculum materials such as textbooks, teaching aids, extra resources, etc., the effectiveness and sufficiency of educational experiences provided (the way the curriculum is translated), and lastly the methods of assessment.

Title

The statement of the present problem is intended to study about “Awareness on Science Curriculum and its Dimensions among High School Teachers”.

Terms and Definitions

- Awareness refers to the state of knowing and being informed of something about science. Here, the awareness deals with the awareness of high school teachers on Science curriculum exists at secondary education level on the basis of their experience, expectations, competencies, and the practical problems faced by the teachers during the time of teaching.
- Science curriculum refers to that it is a totality of broad overview of the school curriculum, including general objectives, subject-specific objectives, suggested schemes of study, and guidelines for the transaction of the curriculum and the evaluation of pupil outcomes specifically with respect to Science subject at secondary education level.
- High School Teachers are those teachers who handle and teach to the students from sixth standard level to Tenth standard level of Government high school education that comes under the jurisdiction of State Board of Education under Tamilnadu Government.

Objectives

- To study whether there is any significant difference between the high school teachers in the awareness on science curriculum and its dimensions with respect to educational qualification.

Null Hypothesis

- There is no significant difference between the high school teachers in the awareness on science curriculum and its dimensions with respect to educational qualification.

Geographical Area

The researcher has employed the survey technique and normative approach. Government high school teachers employed in the fifteen CD blocks of different high schools make up the study's population. Out of the whole population, only 96 people were chosen for the sample by random sampling procedure. The subjects' educational qualifications were taken into account while dividing the sample. Of the 96 government high school teachers who were chosen for the study, 47.3%, and 53.3% came from subjects where the educational qualification was P.G.B.Ed. and U.G.B.Ed. The primary research variable chosen for this study is the participant's awareness of the science curriculum and their educational background.

Tool Used in the Study

The Thangam's Science Curriculum Awareness Scale (2021) is a three point rating scale which is developed and standardized by the investigator. This research scale consisted of forty one positive statements with five dimensions (D1-Objectives of the Teaching Science- 5 statements, D2- Text Book Content-14 statements, D3-Teaching Learning Activities and Resources - 12, D4- Overall Science Curriculum- 10 statements). A pilot study was conducted to thirty government high school teachers who are working under five CD blocks in the Namakkal District to ensure the reliability and validity of the research tool. Then the standardized tool was used for the present study to measure the awareness on Science curriculum amongst government high school teachers.

The total scoring was the total number of points scored by each subject as per the tool. For the positive statements

one is given for “Aware to minimum extent” option and two is given for “Aware to medium extent” option and three is given for “Aware to maximum extent” option. The total score is 123 and the minimum score is 41. The total score indicates the general awareness level of government high school teacher’s status. The lower the score the lower be the awareness and higher the score indicates the higher would be the awareness. There is no time limit for answering it. The reliability based test-retest method of the correlation co-efficient was found as 0.701, and intrinsic validity of the Science Curriculum awareness scale 0.701 is 0.837.

Analysis and Discussion

To find out the significance difference between the mean of U.G B.Ed and P.G B.Ed educational qualification of high school teachers in the awareness on science curriculum and it dimensions, a ‘t’- test was applied and the results are presented in Table-1.1.

Table-1.1 t-test values for the Awareness on Science Curriculum Scores of U.G B.Ed and P.G B.Ed Educational Qualification of High School Teachers

Awareness on Science Curriculum and it Dimensions	Educational Qualification	N	Mean	SD	t-value
D1- Objectives of the Teaching Science	U.G B.Ed	55	11.45	1.7	0.941
	P.G B.Ed	41	11.56	1.5	Not Significant
D2- Textbook Content	U.G B.Ed	55	20.24	4.0	0.584
	P.G B.Ed	41	19.72	4.6	Not Significant
D3- Teaching Learning Activities and Resources	U.G B.Ed	55	16.71	3.6	2.044*
	P.G B.Ed	41	18.21	3.8	Significant
D4- Overall Science Curriculum (Assessment)	U.G B.Ed	55	15.08	2.2	1.220
	P.G B.Ed	41	14.48	2.3	Not Significant
Awareness in Total	U.G B.Ed	55	63.13	5.7	0.654
	P.G B.Ed	41	64.18	5.8	Not Significant

df=94, Table t- Value -1.96 at 0.05 levels

From the above table it is confirmed that framed null hypotheses are accepted in the dimensions like objectives of the teaching science, text book content, and overall science curriculum (assessment), and awareness of science curriculum

in total of U.G B.Ed and P.G B.Ed educational qualification of high school teachers. From the above table it is confirmed that framed hypothesis is rejected in the case of dimension like teaching learning activities and resources ($t=2.044$, 0.05 level) of U.G B.Ed and P.G B.Ed educational qualification of high school teachers.

Interpretation

The overall level of awareness about the science curriculum and its dimensions, such as the goals of the science curriculum, the content of text books, and the assessment of the science curriculum, is not significantly influenced by educational background; however, the teaching learning activities and resources related to the science curriculum are significantly influenced by educational background. Compared to high school teachers with U.G.B.Ed. qualifications, those with P.G.B.Ed. qualifications are more knowledgeable about the science curriculum.

Recommendations

The degree of knowledge of the teaching and learning activities and resources related to scientific curricular elements is significantly influenced by one's educational background. According to the mean value, postgraduate qualified high school instructors are more knowledgeable of resources, teaching, and learning than their undergraduate counterparts. The scientific curriculum consists only of dimensions that are understood, including textbook material, instructional learning activities and tools, assessment techniques, and overall science curriculum objectives. Thus, during in-service and orientation programmes, teachers should receive a comprehensive explanation of the aforementioned elements from their trainers.

The upper primary scientific curriculum should be viewed as a watered-down version of the secondary stage curriculum and should not be subject to disciplinary measures. Thus, educators should prepare learning materials in accordance with the curriculum topic and arrange activities based on that subject. A scientific curriculum's technology component might cover elementary model design and construction, useful understanding of typical mechanical and electrical equipment, and regionally specialised technologies. Thus, using technology in conjunction with the student-centered teaching approach improves accomplishment output, as evidenced by outcome evaluation.

It is important to acknowledge that technology comes in a wide variety of forms that assist in meeting the requirements of children. Regardless of time and effort, these disparities in exposure and interest should be addressed by particular contextualised programmes.

Implications

A teacher should encourage peer interactions, class discussions, newspaper research, neighbourhood conversations with knowledgeable people, data collection from readily accessible sources, and simple investigations in which students are heavily involved in the design.

More time, a wealth of teaching resources and expert assistance are all necessary for teachers to comprehend the science curriculum framework. It is acknowledged that teachers must assess their own shortcomings and seek out information and resource support from various educational institutions and other sources in order to develop the competency necessary to carry out tasks at the school level. For students to successfully comprehend the curriculum, they need to be taught tactics like the play way approach, peer tutoring, cooperative learning, Universal design for learning (UDL), Multiple Intelligences, Instructional Design ,CCE, etc.

Conclusions

A key component of pedagogy is organizing and presenting knowledge through plays and skits in the classroom, school, or neighborhood to promote more engagement and sharing of learning results. At this point, teaching pupils about the lives of scientists and innovators might be a helpful way to motivate them. The upper elementary level should see a continued focus on scientific process skills to help kids develop their capacity for independent learning, which will help them continue their education even after school.

References

- Davey, & Jemima. (2021). Making Science Core Again -Teaching High-Quality Science in a Time-Poor Curriculum. *Primary Science*, 166, Pp-15-17,
- Jaiswal, S. (2010). Attitude toward new evaluation system. *International Research Journal I*, 3-4.
- Kauts, D.S & Kaur, V (2013) Perception and Attitude of Teachers from Rural and Urban Background towards Continuous and Comprehensive Evaluation at Secondary School level. *Journal of Education*. 2(5), 128-132.

- Marshall, & Karen. (2018). Encouraging Resilience in the Science Curriculum. *School Science Review*, 99(69), Pp-108-115.
- Ramasamy, Muthuveeran, Pilz, & Matthias. (2019). Competency-Based Curriculum Development in the Informal Sector: The Case of Sewing Skills Training in Rural South India. *International Review of Education*, 65 (6), Pp-905-928, ISSN-0020-8566
- Rathy G.A. (2013). Effectiveness of the Power Electronics Curriculum of B.E Degree Programme using Blooms Revised Taxonomy International. *Journal of Computer Applications*, 69(5), ISSN: 0975 – 8887.
- Sanjeev Sonawan, & Madhuri isave (2012). Study on CCE at Secondary Stage. *International Educational e-Journal* .1(2), 1-6, ISSN:2277-2456
- Vincent De Paul, S., Thangarasu, S., &G.Murugan (2012). The DTED. Curriculum / Syllabus of the State Tamilnadu in India and Performance of Student Teachers, *IOSR Journal of Humanities and Social Science (JHSS)* ISSN: 2279-0837, ISBN: 2279-0845. 3, (4), PP 01-14, www.iosrjournals.org.
- Yadav Amit, & Jabir Ali. (2016). Parents' Perception towards Inclusion of Agriculture in School Curriculum in Rural India. *Journal of Agricultural Education and Extension*, 22 (3), Pp-241-254 2016, ISSN-1389-224X
- Yadu Kumar M & Kiran Kumar K. S.(2015). A study on awareness of CCE among Secondary school teachers, *scholarly research journal for interdisciplinary studies*, 3 (17), 3114-3120.