Journal of Advances and Scholarly Researches in Allied Education
Vol. 18, Issue No. 5, August-2021, ISSN 2230-7540

Challenges & Issues in Science Teaching At Secondary Level in North Bihar

Parul Priya[1]* Dr. Mihir Pratap[2]

[1,2] Assistant Professor, Department of Education, C. N. College, Sahebganj, Muzaffarpur (Constituent Unit of B.R.A.B.U, Muzaffarpur)

Abstract – The importance of education illuminates the value of education in one's life. Education has a significant impact on our lives because it facilitates the proper progression of our learning, awareness, and ability by altering the personality in order to achieve positive attitudes. Despite the volume of research in the literature on elementary school science education, students continue to face difficulties. The purpose of this paper is to investigate and articulate how students encounter difficulties while learning science. Our study is qualitative in nature and is motivated by phenomenological concerns. The information was gathered through the use of comprehensive semi-structured open-ended questions, and the data were analysed and deduced in detail. This paper will eventually examine the students' personal experiences with this subject. Our study identifies the factors that limit students' desire to study science subjects and desire to improve their in-depth understanding. Additionally, it elucidates the influences of the teacher's actions and factors pertinent to the students that contribute to the students' difficulties. Additionally, it was discovered that the majority of students enjoy learning science subjects and find them interesting. A teacher's characteristics must include professionalism and conscientiousness. He should have sufficient knowledge and mastery of the subjects he tutors and be familiar with cutting-edge techniques. Frequency counts and percentages were used to analyse the data. The paper recommended that regular workshops be organised for all teachers to enable them to effectively manage Integrated Science, that in-service training be included in continuing teacher education, and that teachers be supported to increase their level of confidence when teaching Integrated Science.

Keywords – Science Students, Class Room Environment, Technology In Teaching, Issues Of Science Students.

----------X----------

INTRODUCTION

Teaching Integrated Science presents significant difficulties, and teachers frequently express concern and apprehension when confronted with the situation. Teachers' lack of confidence when teaching subjects outside their area of expertise manifests itself in a variety of ways, including when developing lesson plans, selecting or creating activities and analogies to aid students' learning, responding to students' questions, connecting and applying various concepts and principles to real-world situations, and generating students' interest and passion for Integrated Science. This article discusses various research studies that have been conducted on teachers' experiences teaching Integrated Science.

The purpose of teaching Integrated Science is to create a student-centered learning environment that is responsive to the unique needs of each student through the use of differentiated instructional strategies and to deliver an outcome-based curriculum that adheres to rigorous pedagogical standards. Unlike the traditional didactic teacher-centered approach used in schools, an active and child-centered approach was required to deliver the new curriculum, which emphasised critical thinking rather than rote learning (Davidson, 2015). Integrated Science education is no longer centred on the teacher or reliant on memorization. ADEC recommends using an inquiry-based teaching approach when instructing students to help them develop their scientific knowledge and skills (ADEC, 2015). ADEC defines inquiry as "a process that encourages students to be self-directed learners through the use of rich questions and the development of their knowledge around those questions" (ADEC 2013, p. 12).

Education has a significant impact on the development of a country. It instils in people a sense of responsibility. As a result of education, the general public not only recognises their responsibilities, but is also capable of effectively enforcing their rights at the national, communal, and individual levels (Ahmad, et.al., 2014).

Education instils confidence in children by developing their personalities. Thus, improved

education is critical for everyone's success (Archana 2016).

Teaching is a multifaceted activity and a progression that tends to provide teachers with a controllable environment in which to generate predetermined learning in students. The purpose of education is to instil positive changes in students (Akhtar, 2018). Indeed, teachers assume increased liabilities as a result of changing times and the specialised nature of their responsibilities in order to address current challenges. These changes are primarily motivated by our country's economic and technological advancement over the last few decades (Akhtar, 2018). Most importantly, the majority of people prefer private educational institutions, primarily schools, because they provide a higher standard of education (Rao and Khadar, 2014).

Science education has gained importance in the current educational system for many governments and researchers. Numerous governments exert influence to advance science education. As a result, extensive research has been conducted to determine which variables exist at all levels using a variety of variables and methodologies (Adu-Gyamfi, 2014). Today's elementary students face numerous challenges in our country. Since independence, the primary issue has grown and been resisted in the system. We were unable to provide suitable laboratories and equipment for use during science instruction (Sarangapani, n.d)

Science teachers' knowledge and implementation of instructional procedures are critical for the development of students' interests and attitudes toward any science subject in the foreseeable future, for example, appraisal procedures, student groupings, and the nature of incentive and penalty (Anderman et al., 2012). The purpose of this research paper is to determine whether or not it is easy to teach science at the elementary school level in a private school in Patna, to investigate the teaching method of using technology, and to examine the circumstances under which students perform and learn better when conducting experiments in their laboratories. The purpose of our study is to examine the difficulties encountered by students while teaching science at the elementary level in Patna's private schools.

This study will examine issues relating to common difficulties that students may encounter and the ways in which teachers assist students in overcoming those difficulties. Additionally, the study will examine the nature of problems encountered by students while teaching science. Science imparts knowledge about the physical and natural worlds. Science can provide knowledge about non-human objects, their possessions, and interfaces through examination, measurement, discovery, assumption, and theoretical imagination. The subject of science directs attention to the material world, regardless of whether the subject is related to the topic of forces in physics, the solubility of substances in water in chemistry, or biology genetics.

This focus attracts the processes of thought and motivates students to learn about the fundamental concepts and theories associated with them. On the other hand, science classrooms and schools clearly lack this approach. Indeed, science classes, like history and language classes, are not unique. Teachers impart knowledge to students through textbooks (Sarangapani, n.d)

The challenge of strengthening science education

There is widespread concern about the outcomes of elementary school science education. For example, industry representatives assert that any country's ability to compete successfully in technology-intensive global markets requires an increase in high-level scientists, technicians, and engineers. Whatever their career goals, too few young people continue to study science in high school once it is no longer required. This results in a decline in science degree applications and a decrease in the supply of science graduates. Notably, the number of young people entering non-graduate science or technology occupations declines, resulting in skills shortages in a variety of sectors. Sir Gareth Roberts' 2002 Review summarised the magnitude of this problem. Additionally, it identified several of its causes. It specifically noted a lack of female students choosing science-related subjects, student reports of poor experiences with science education, a shortage of qualified and enthusiastic science teachers, and young people's negative perceptions of science-related careers. The Roberts Report served as the impetus for the creation of the government's ten-year 'Science and Innovation Investment Framework 2004–2014. While the strategy makes some pertinent references to teacher supply and curriculum issues, it provides scant guidance on how its lofty objectives will be accomplished..

The back ground to a strengthened science education

Students bring their cultural legacies to their studies. They have all gained experience learning science outside of the classroom and are capable of forming and expressing their own opinions. This means they have their own perspectives on science education, which must be considered. There can be significant disconnects between what children learn in science class and what they experience in the rest of their lives. According to Aikenhead, school science expects students to cross this line, which is more intimidating for some students than others. Schreiner examined how students' attitudes toward science can be interpreted as expressions of their identity, whereas Reiss concluded that school science education can only succeed if students believe the science they are learning has personal value for them. Unless and until school science explicitly engages the diverse interests and concerns of today's students, it will lose their interest.

As such, it must consider how it can positively respond to the wide variety of student concerns. It must consider how to better reach out to women, those with strong religious convictions, those with limited cultural capital, and those with current or recent ties to non-Western societies. There is far too little systematic knowledge about these issues. A conundrum for science educators is that while school students are often disengaged from science lessons, they are frequently engaged by science outside the classroom. Science is frequently portrayed as exciting, challenging, and uplifting in science museums, hands-on centres, zoos, and botanical gardens. Newspapers and magazines are excellent sources of science information, as are debates about current events. The proliferation of multichannel television and the internet have resulted in the emergence of sources of high-quality, attractively packaged information about science and issues affecting young people. Additionally, we are living in a golden age of popular science book publishing, with a plethora of high-quality science books available for both children and adults..

Learning and teaching science

There is now a sizable body of knowledge about science education and learning. It has been developed through scholarly and empirical research conducted in a variety of countries worldwide. All teachers are aware that what they teach is not identical to what their students learn. As is the case with all forms of communication, learners must make sense of what they hear, see, and read in light of prior knowledge. Teachers can make this easier or more difficult for pupils by structuring messages and eliciting and responding to pupils' questions. This fundamental insight, that learning requires individuals to respond actively to information and its context, has been developed into several theoretical perspectives that have informed the planning of science instruction. A recent example is the design and evaluation of brief science teaching sequences for early secondary education. Incorporating a social constructivist perspective on learning into the design of such sequences were insights about the treatment of content and patterns of teacher talk. Students' comprehension was significantly improved when they followed these teaching sequences compared to when they followed their school's standard teaching programmes. There is compelling empirical evidence that several of the fundamental concepts upon which scientific understanding is built are frequently misunderstood by learners, and that the difficulties they encounter follow a pattern.

Numerous approaches to resolving this issue have been developed and evaluated with favourable results. This type of evidence is beneficial in identifying key conceptual difficulties that students are likely to encounter at various points throughout the science curriculum. It is possible to develop useful tools for resolving those difficulties. The research findings do not equate to simple prescriptions for 'what works' and thus what science teachers should be required to do. However, research can assist science teachers in planning how to approach difficult content in a way that their students will understand, as well as guide their classroom conversations with students. Additionally, significant research has been conducted on the ways in which classroom communication, specifically talk, can be used to assist students in developing an understanding of scientific content. This evidence demonstrates how teachers can employ a variety of different conversational patterns for a variety of instructional purposes. It can be used with individuals, small groups, or entire classes and can assist in achieving objectives such as introducing new ideas or assisting learners in utilising newly introduced content independently..

OBJECTIVES OF THE STUDY

1. To study on challenge of strengthening science education

2. To study on Learning and teaching science

METHODOLOGY

This study employed a mixed-methods approach. A structured questionnaire was used as the instrument. The study collected data by distributing 70 questionnaires to 70 teachers. Purposefully, six (6) public B. D. Public Schools in Patna and one (1) private Sacred Heart School in Sitamarhi were chosen. Ten teachers were randomly selected from each Junior High School, totaling 70. The researcher used the random sampling method, writing 'Yes' and 'No' on slips of paper and asking teachers in each school to choose one. Those who responded 'Yes' were randomly selected for the study. The researchers explained the study's purpose and emphasised the importance of participants remaining anonymous. The survey questionnaire included items on a four-point Likert scale and qualitative questions derived from and related to the reviewed literature. Seventy questionnaires were completed and returned in their entirety. Frequency counts and percentages were used to analyse the data. The research question was developed to enable us to ascertain the difficulties that Integrated Science teachers at B. D. Public School face when teaching the subject.

RESULT

Numerous issues were identified and addressed individually as a result of the gathered data..

Professional Development

Abu Dhabi's educational policy agenda indicates that all teachers in public schools will receive ongoing professional development (ADEC, 2010). This is not the case, however, at B. D. Public School in Patna. The study's findings in Table 1 indicate that only 3 (4.3 percent) of participants receive professional

development in science planning and teaching, while 67 (96.7 percent) do not..

Inadequate background in science

Inadequate subject knowledge is a major contributor to these challenges and will have an effect on the development of teachers' pedagogical content knowledge, as well as on teachers' self-confidence and attitudes when teaching Integrated Science topics. According to Table 1, only 13 (18.6%) of participants have an adequate background in science, while 57 (81.4%) have an inadequate background in science..

Availability of resources

The science curriculum, at any level, is a statement about the aspects of science that we choose to teach from a much larger set of possibilities. These choices, which include the educational purpose, what is most valuable to individuals and society, and how to balance intrinsic and instrumental motivations for learning, all encapsulate values. While empirical evidence can aid in the decision-making process, it cannot make them. For example, scholarship and analysis have shed light on the nature of scientific knowledge and its implications for learning. More of this type of work should be included in curriculum research. Science educators have recognised the significance of major trends in twentieth-century science scholarship, most notably Popper and Kuhn's work, for science education. However, it appears as though much science education has missed this lesson. Certain writings on science education have recognised a tension between indoctrinating students into an agreed-upon and largely impersonal structure of knowledge and the personal and social values associated with education and schooling. This insight, however, has been sporadic and has had little effect on teaching..

Non-availability of resource centre

As shown in Table 1, the majority of participants (70 percent) indicated that their school lacks a resource centre, which is a hindrance to their lesson delivery..

Teachers' self-confidence

Another factor impeding the teaching of Integrated Science in the selected schools of study is teachers' lack of confidence in their abilities. Numerous teachers 45 (64.3 percent) teaching Integrated Science to students at B. D. Public School, Patna cite a lack of confidence as a barrier to teaching Integrated Science in the selected schools of study. While 25 (35.7 percent) expressed confidence in their ability to teach the subject,

Table 1. Challenges faced by teachers when teaching integrated science

S/N	Challenge	Number of Teachers = 70			
		SA	A	DA	SD
1.	I receive professional development training on planning and teaching of science	F(%) 2(2.9)	F(%) 1(1.43)	F(%) 45(64.3)	F(%) 22(31.43)
2.	I have adequate background in science	5(7.14)	8(11.42)	47(67.14)	10(14.3)
3.	I have available resources for teaching of science in my school	10(14.3)	5(7.14)	35(50)	15(21.43)
4.	My school have resource centre	–	–	60(85.7)	10(14.3)
5.	I have confidence when teaching science	15(21.43)	10(14.3)	30(42.9)	15(21.43)

Source: Field survey March, 2018

CONCLUSION

The purpose of this study was to identify potential barriers to successful integrated science teaching in B. D. Public School, Patna. These findings have significant implications for Teacher Educators and school administrators because they may indicate the need for, and can help inform, revisions to Teacher Education policies and school administrative strategies to address emerging issues. Inadequate subject knowledge is a major contributor to these challenges and will have an effect on the development of teachers' pedagogical content knowledge, as well as on teachers' self-confidence and attitudes when teaching Integrated Science topics. It would have been beneficial to have regular workshops for all teachers to equip them with the skills necessary to effectively teach Integrated Science. The majority of participants perceived a lack of such resources as a barrier impeding their ability to deliver effective lessons. Teacher education should be responsive to changes in methodology and curriculum in order to expose teachers to innovations in their field; in-service training should be a component of continuing teacher education. Another factor impeding the teaching of Integrated Science in the selected schools of study is teachers' lack of confidence in their abilities. Numerous teachers instructing students in Integrated Science at B. D. Public School, Patna cite a lack of confidence as a factor impeding the teaching of Integrated Science. It would be fascinating to conduct an in-depth study of these teachers and to devise strategies for supporting them in order to boost their confidence when teaching Integrated Science.

REFERENCES

[1] Adu-Gyamfi, K. (2014). Challenges faced by science teachers in the teaching of integrated science in Ghanaian junior high schools. Journal of Science and Mathematics Education, 6, 59-80. Retrieved on 24th July 2018 from http://www.academia.edu/11509955/Challenges_face_by_Science_Teachers_in_the_Teaching_of_Integrated_Science_in_Ghanaian_Junior_High_Schools Google Scholar

[2] Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman and Company.

[3] Childs, A., & McNicholl, J. (2007). Science teachers teaching outside of subject specialism: challenges, strategies adopted and implications for initial teacher education. Teacher Development, 11(1), pp. 1-20.

[4] Davidson, C. M. (2010). The Higher Education Sector in the Gulf: History, Pathologies, and Progress. Dubai: Gulf Research Center.

[5] Kind, V. & Kind, P.M. (2011). Beginning to Teach Chemistry: How personal and academic characteristics of pre-service science teachers compare with their understandings of basic chemical ideas. International Journal of Science Education, 33 (15), pp. 2123- 2158.

[6] Magnusson, S. K., & Krajcik, J. J. & Borko, H. (1999). Nature, sources and development of pedagogical content knowledge for science teaching. In Gess-Newsome J. And Lederman, N. G. (eds). Examining pedagogical content knowledge: The construct and its implications for science education. p. 95 – 132. Dordrecht: Kluwer Academic Publishers.

[7] Riggs, I. M., & Enochs, L. G. (1990). Toward the development of an elementary teachers' science teaching efficacy belief instrument. Science Education, 74 (6), pp. 625-637.

[8] Sengul, S.H., Cetin, G. & Gur, H. (2008). The Primary School Science Teachers' Problems in Science Teaching. Journal of Turkish Science Education, 5(3), ppp. 82-88.

[9] Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. Educational Researcher, 15 (2), pp. 4-14.

[10] Shulman, L. S. (1987). Knowledge and Teaching: Foundations of the New Reform. Harvard Educational Review, 57 (1), pp. 1–22.

[11] Educational Institutions in Bihar-Govt. Of Bihar, gov.bih.nic.in>profile>Institutions>Accessed 7 Jan,2018.

[12] Maji Debabrata (2011). 'Strategic Planning of HRD', in Markandey and Simhadri(ed)'Globalization, Environment and Human Development', Rawat Publications, Jaipur.

Corresponding Author

Parul Priya*

[1,2] Assistant Professor, Department of Education, C. N. College, Sahebganj, Muzaffarpur (Constituent Unit of B.R.A.B.U, Muzaffarpur)

priya.parul28@gmail.com