

SCIENTIFIC LITERACY AND SUPERSTITIOUS BELIEFS OF SCHOOL STUDENTS

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Abstract

The varied scientific knowledge accumulated over the last few decades bears witness to the knowledge exposition. Despite the tremendous progress in science and technology with increasing interest in science, our society still holds many superstitious beliefs regardless of literacy (Promsri,2018). Nowadays teaching science in school has developed huge interest today as compared to the past. Formal education is believed to be a forceful tool for the eradication of superstitious beliefs but in actuality, we rarely found it to be true. It is observed that our schools have not succeeded in producing scientific awareness among students and students still hold many superstitious beliefs. The problem of superstition is caused because of unawareness and lack of education and social awareness. This social awareness develops if one can effectively understand the inter-relationship between science and society. This understanding comes through scientific literacy- a literacy system which not only comprised of 3R's- Reading, Writing and Arithmetic but a new system of literacy that will enable students to develop a better understanding of their environment or society, because "a scientifically literate person feels concerned about the environment and social issues and in turn responsible to act" (Pella,1966). This paper emphasizes the concept of scientific literacy and superstitious beliefs and their respective influence on students. This paper also explores the relationship between scientific knowledge and the superstitious beliefs of students.

Introduction-

In our culturally pluralistic society values and beliefs fostered through education would help to eliminate various social evils like cynicism, obscurantism, fatalism, violence, and superstitions and superstitious beliefs are one of the most prevailing societal evil from them. Such beliefs are caused because of unawareness and ignorance of basic sciences. Not following universal facts and

replacing them with orthodox and religious practices are the major cause for feeding them into our brain. Formal education is believed to be responsible for the eradication of superstitious beliefs but in actuality, we rarely found it to be true. Nowadays teaching of science in school has developed great interest today as compared to past. However, it is seen that our schools have not succeeded in producing scientific awareness among students and students still hold many superstitious beliefs). These superstitious beliefs have a negative influence on lives, especially on education. Those who are familiar with some important scientific principles, and who were given some scientific education, are still basically illiterate about the real nature of scientific inquiry and the applications of science to everyday life. "Most of our science students retain an unscientific outlook even though they succeed in mastering some scientific ideas and techniques" (Bunge, 1989). A more vigorously implemented and balanced science curriculum will significantly reduce an individual's dependence on superstitious beliefs since more and better science creates scientifically literate individuals. "The more scientifically exposed an individual is, the more readily he/she would discard these beliefs" (Olorundale,1998) because "a scientifically literate person feels concerned about the environment and social issues and in turn responsible to act (Pella,1966). As there is a broad consensus about the need to improve the scientific literacy of students and the general population (American Association for the Advancement of Science), where it becomes necessary to know whether this emphasis has affected the unscientific beliefs (superstitious beliefs) of learners. So, such kind of study is required to reveal student's superstitious beliefs and scientific literacy.

Objective of the study: To explore the concept of scientific literacy and superstitious beliefs in the domain of school students by reviewing previous researches in this field.

Meaning and Explanation of Technical term used:

Scientific Literacy

scientific literacy refers application of science in personal, cultural, political, social and economic issues. It provides insight for addressing societal issues, and deal with many of these issues and make logically sound decisions pertaining to life and society

In recent years the familiar term Science for All has come to be equated with scientific literacy appropriate for all students whether they intend further science-related studies or not (Robert, 2007) and there is a broad consensus about the need to improve the scientific literacy of students and the general population (American Association for the Advancement of Science, 1889). A scientific literate student has insight for addressing societal issues, and deal with many of these issues and make logically sound decisions pertaining to life and society.

OECD/ PISA defined scientific literacy as “the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions to understand and make decisions about the natural world and the changes made to it through human activity” (Gillbert, 2004).

Superstitious beliefs:

It refers to an irrational belief or practice related to activities that could lead to certain other activities without a logical link. People believe that luck, magic, and some unforeseen causes will change their lives and help them to live longer and better. Superstition is a practice or belief, which is fed into our brain and forces us to believe in it. It is simply nothing rather than believing blindly in something without verification (Kalita, 2016). It might be a product of a lack of confidence in one’s self and the world of science and logic. “Most superstition from past have been proven by science as unnecessary, ineffective, or just silly but are still practiced by normal intelligent people today” (Shrivastava and Kotnala, 2015). Students are living in the era of scientific revolution and they have an immense source of the scientific information at a fingertip even though most of them believe in some or the other superstitions as a way of dealing with the unknown. One’s who don’t believe in it tend to caught up in the complex web of superstitions through others. Often, they didn’t know about the origin and reason behind their superstitious belief and continue to follow it. Their ignorance accumulating from generations becomes their superstition.

Characteristics of a Scientific Literate Student:

A Half Yearly National Peer-Reviewed & Indexing with SJIF Impact Factor Research Journal

A scientifically literate person has the following abilities:

- A scientifically literate person is always curious to know about its surrounding.
- A scientifically literate person thinks logically.
- A scientifically literate person can able to seek answers to questions generated from everyday experiences.
- A scientifically literate person always analyzes local, national, international, Global issues and in turn, makes informed decisions.
- A scientifically literate person stays up to date from various information.
- A scientifically literate person evaluates the truthfulness of any information or data based on sources of information.
- A scientifically literate person communicates and shares the right information with relatives, peers, caregivers, and others.
- A scientifically literate person has a faith in science that’s why he/she able to predict, analyze, describe, and explain a phenomenon rationally.
- A scientifically literate person evaluates the quality of information/ facts disseminated by various sources and then interprets and categorized information as valid information or misbelief or superstition or false fact etc.

Superstitious Beliefs and School Students:

- Superstitious beliefs are carried forward from one generation to another and the community plays an important role in this transmission. Superstitions are intangible heritage. Students also learn it through society and follow superstitions like customs, rituals, etc. because they have fear if they didn’t follow certain rituals, customs they suffer from future consequences of not following the regulations.
- According to Piaget in adulthood superstition might reappear in periods of distress through regression as a defense mechanism unconsciously and this regression helps in controlling the world by the illusion of an overpowered mind.
- Younger people might be more easily and strongly affected by the superstitions (Torgler, 2003).
- Major factors responsible for superstitious beliefs among students are ignorance, fear of the unknown, low self-confidence.
- To cope with the uncontrollability of life students in the adolescent period hold various superstitious beliefs (Sagone & Calori 2014).

- When students suffer from low self-confidence in themselves, they usually follow superstitious beliefs to improve their self-confidence
- Most of the students categorized their superstition into two types- 1. Superstitions that are considered good for them and if they follow, it will bring good luck, 2. Superstitions that are considered bad for them and they have to get rid of them to protect themselves from bad luck.

Scientific Literacy and Superstitious Beliefs:

The influence of both science and superstition on society is manifold and deep-rooted. Superstitious belief is commonly perceived as a response to uncertainty and helps people cope with uncertainty by providing additional sources of information (Tsang, 2004). But its irrational nature renders the validity of such information doubtful because its irrational nature leads to cognitive dissonance among people who believe in science. "Superstition exerted a negative influence on children, learning from science. These beliefs tend to impede an individual's conceptualization of scientific knowledge by creating an existing prior knowledge which is in contrast to scientific knowledge to be learned" (Fredrick, 2013). The roots of superstition can only be eradicated if one can effectively understand the interrelationship of science and society and the understanding of this relationship comes through scientific literacy because a scientifically literate person interacts with the various aspects of his/her real-life situations in a way that is consistent with the value that underlies science. A scientifically literate student feels concerned about societal issues, and in turn responsible to act on these issues, and empowered to use science as a tool in addressing these issues. Here we can say that scientific literacy can foster a tendency to have modified social experiences and analytical conception rather than just sensory perception and with the help of this a person can remove social evils like superstitious beliefs.

Impact of Superstitious Beliefs on Science learning of students:

Castelao and Lawless (2002) observed that "there is no direct connection between the growth of scientific knowledge and rejection of nonscientific ways of thinking. Even those who are familiar with some important scientific principles, and who were given some scientific education, are still basically illiterate about the real nature of scientific inquiry and the applications of science to everyday life.

- Josephine (2015) concluded that as various components of superstitious beliefs like good-luck, bad luck, impending danger, etc. increases, academic achievement in early childhood science of learning decreases and vice-versa.
- Olorundale (1998) said that superstitious beliefs are stubborn and often held firmly in such a way that they exerted a negative influence on students and learning from science. By creating an existing prior-knowledge it interferes with the scientific knowledge of students.
- "Superstition exerted a negative influence on children, learning from science and impede student's conceptualization of scientific knowledge by creating an existing prior knowledge which is in contrast to scientific knowledge to be learned" (Fredrick, 2013).
- "The real cruelty behind the superstitious belief is that it creates mental slavery. Here the person stops thinking about his behavior, ignores the science, he/she has learned till date and supports his decision, whether it is right or wrong and opens the door of mind for the exploitation" (Takale, 2015).
- Things that are not grounded in scientific evidence are often considered irrational. The irrationality normally associated with superstitious beliefs and the rationality associated with science indicates an apparent contradictory relationship between superstitious belief and science. There seems to be, however, an important complementary relationship between superstitious belief and science. They are complementary in the sense that the former serves as a means of coping with uncertainty associated with the latter.

Conclusion

Various researches showing that superstitious beliefs have a negative influence on the thought processes and actions of students. Such beliefs interfere with student's scientific knowledge and impede student's conceptualization of scientific knowledge due to which they make decisions based on irrationality. Students also have fear if they don't follow their superstitious beliefs they would necessarily suffer from its consequences and as a result of this fear conflicts, anxiety, distress, obsessive-compulsive disorder, arises in them. The prevailing degree of superstitious beliefs in the student is a challenge for us and our educational system. It is our responsibility to prevent the haze of superstitious beliefs from harming our students

by educating them and developing science education in school by relating with real-life situations. Superstitions necessarily are eradicated by the development of scientific knowledge because it can change the world from contemporary civilization to scientific literate civilization. A scientifically literate person uses the process of science for solving real-life situations. If our educational authorities and planners make our curriculum in such a way that develop a scientific outlook and beliefs among students in a real sense then students can self-differentiate between rational and irrational beliefs (superstitious beliefs)

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