

UNDERSTANDING THE TEACHER'S PERCEPTION OF THE ROLE OF COMMUNICATING SCIENCE TO SCHOOL COMMUNITY

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ABSTRACT

The current study was conducted to explore teacher's perception of the role of communicating science to the school community at the secondary level in both private and government schools. For the current study, a qualitative research design was used to gather data. This study was a qualitative examination of qualitative opinions on the role of disseminating science in schools that was conducted without using experiments. Because of the nature of this research, the use of the qualitative technique was important in order to ensure that some additional observations were generated for certain fundamental goals. 25 science teachers participated voluntarily in this research. In a present study among participants, 64% were females and the remaining 36% were male from both sectors of employment. Psychologists believe about 90% of all contacts are non-verbal and several reports showed that at least 75% of all communication in schools is not verbal. Therefore, it makes sense for instructors to take advantage of non-verbal contact in the classroom. To this end, the techniques and tactics utilized by a community of science teachers to incorporate and teach skills in an SC curriculum were investigated. Our results suggest that the justification of the educational paradigm has been grasped. Any of them custodial and developed their procedures according to their desires. Customizing teaching materials involves a profound knowledge of the essence of initial creativity and the social influences that shaped their design. Every instructor has a complex profile at the beginning of the research in interviews with professors. The secondary level teacher had faced various difficulties in science communication. To teach and communicate science is not so easy. At the school level, lack of facilities and technology, lack of experience of teachers, lack of interest of students, only oral communication, and lack of practical activities are the difficulties in communicating science. By developing the interest in science education in students and by making a proper environment for science communication, we can overcome these difficulties. They also agreed that science communication played important role in the life of the student. Furthermore, Science is more effective and useful for students in their practical life.

Keywords: Science communication, perception

1. Introduction

Science communication is a practice of informing, educating, sensitizing, and enhancing the discovery rate of new things and influences of the things that are present all over the world. Science communication is the practice to expose the various things that help in the future for further development in positive and effective ways. The communicators of science and their listeners are defined ambiguously, and science skills and all levels vary from each group. The science outreach (naturally led by specialist scientists to word the non-experience viewers) and science's reach are two types of defined scientific communication (the way of communication from skilled to skilled from similar or different scientific backgrounds). The communicators of science could be used to entertaining and persuading, including various types of humor, account, and metaphors. Scientists could be trained in a few of the methods used by actors in improving their communicating skills (Grushkin, 2010). Continuous evaluation of science and engagement allows for a resource-efficient design of engagement but avoids well-known dangers (Jensen & Gerber, 2020). In this type of communication, science can be generated and also supports scientific research or science education and inform decision-making that is connected with politically aware and ethical thinking (Gregory & Miller, 1998). (Jensen & Gerber, 2020) also

explained to tackle scientific misinformation, it can be an effective medium between different groups and individuals who have a stake in public policy, industry, and civil society.

The goal of this type of communication is in the learning process and to make it possible for students to earn their livings and to become helpful and meaningful full members of society. This adaptation meant conformity with things in primitive societies. The success of this process depends on how much teachers and learners interact and communicate (Woolfolk & Shaughnessy, 2004). Every student has the right to choose his or her way rather than to fit into a stereotyped system of education that demands individual attention, initiative, and self-education among the students. Modern approaches encourage students to work independently, to set their own goals, to the plane of their activities and shared thoughts openly with their teachers. Teachers act as a guide for and also acted as advisors in modern thoughtful schools (Kochhar, 1992).

Scientific achievements in European society knowledge are one of the objectives set by the European Commission's Lisbon Strategy in 2000. The Lisbon program aims to make Europe the largest knowledge-based economy by focusing on the efficiency and quality of "training, employability, human capital, innovation and research." This requirement is also seen as critical for the quality of democracy so that every citizen can exercise their right to participate and make choices in social life (Education et al., 2007). The questions remain for years about how people have lack of scientific explanation and confidence about science applications as well as young people's lack of interest in understanding the various studies and careers in science disciplines. This has also been confirmed by some variations in the theme, national and international youth and science surveys. A report published by (Oecd, 2007) about children shows natural curiosity as well science and technology many researchers also says that children act as "little scientists" in their approach to the world around them. However, the children interest disappears completely from these subjects in a traditional path of science education, affecting to education and communities in education and career choices there for need to explore further the role of communicating to science communities in schools.

It turns out that there is a need for effective communicators among scientists and other technical specialists. Scientific writing can often get clogged up with technical details and confusing jargon; scientists transfer that knowledge with the hopes of reaching people, but those people can have trouble understanding what it all means. When context is not available, connections are missed, and critical discoveries may remain hidden. Other editors and teachers noted difficulties collaborating with scientists, which was a sure sign that science communication had room to improve.

2. Statement of problem

Based on recommendations from educators, scientists, and students, a number of seminal reports have called for undergraduate curricula to engage students in some of the same practices as scientists, one of which is communicating science to a general, non-scientific audience in order to prepare them for careers in science. Unfortunately, little research has been conducted on how to assist students in developing these skills. Prior to beginning instruction, one of the most important first steps in developing effective and efficient curriculum are determining what baseline competencies students possess. The Essential Elements for Effective Science

Communication (EEES) framework was used in this study to assess the Science Communication skills of students enrolled in an environmental science course who had received little prior Science Communication instruction.

3. Objectives of the Study

There are the following objectives

- To explore teachers' perceptions of the role of communication of science to the school community.
- To find out the benefits of science communication to the school community.
- To explore difficulties in communicating of science to the community.

4. Significance of the study

The current study focuses on an issue that is important not just to the scientific community, but also to the country as a whole and to each individual within it. People need a fundamental understanding of science more than ever before, whether they are involved in national or local decision-making, managing industrial businesses, working in skilled or semi-skilled positions, voting as private citizens, or making a range of personal decisions. The Council hopes that by publishing this study, it will attract attention to the need for a better understanding of science, particularly how science and technology pervade modern life, as well as debate and decisions on how to best promote them.

5. Research Questions of the study

There are the following research questions

- How do the teachers perceive the role of communication of science to the school community?
- What are the benefits of science communication to the school community?
- What are the difficulties in communication of science in school community?

6. Research Methodology

The researcher used semi structure interview to explore the science teacher opinions about the role of science communication. The population was consisted of 25 science teachers from secondary schools.

Therefore, the use of the semi structure interview methods in this study proved to be useful tools for the purpose of data collection. This method gives more valid and useful data.

7. Population and Sample

The population of study was consisted of science teachers who are teaching science at secondary level. The students and teacher of all the public schools the population of the study. The sample was selected purposefully to gain results.

8. Data analysis

The relevant data analysis techniques were used. The data was transcribed and themes were generated by the researcher manually.

9. Results:

Interview data emerged the following themes Teacher's understandings about Science Communication

- Importance of Science Communication
- Advantages of Science Communication to Secondary students
- Difficulties in Communicating Science

9.1. Teacher's understandings about Science Communication

Interview data inform this research about participants understanding about science communications. Some teachers said we teach science because it tells students about science applications. For example T2 said "*Science communication contributes to the awareness of scientific objects in the classroom. Students are important factor of school community; they should be acquainted with the advance knowledge of science.*" It is clear from his view that students are important factor of school community, they should be acquainted with the advance knowledge of science. Light is a unique invention in the discovery in this field. Students must understand its positive and negative effects because it highlights the importance of science and its communication. So it is believed that teachers can only communicate science with the understanding of daily life use of scientific objects. Another opinion shows for example T4 said

"Teachers can only communicate science and findings of science when they get up to date knowledge of science literature" another opinion shows that

T7 said that *"not only knowledge of science literature is necessary for communicating science but advance methods of doing science work are also necessary"*.

From the interviews of science educators at secondary level it is concluded that literacy is one of the main objectives of the reform of science education. Some teachers said we teach science because it tells students about science. Science communication contributes to the awareness of scientific objects in the classroom. Students are important factor of school community; they should be acquainted with the advance knowledge of science. Light is a unique invention in the discovery and invention, students must understand its positive and negative effects because it highlights the importance of science and its communication.

T8 said that *"science education only requires materials for learning"*. According to them material here means practical work like apparatus. Objects which is used to clear the concepts of the students.

T5 believe *"science must be able to carry out scientific research"*. Science communication is an interactive process involving an atmosphere of mutual respect between researchers, educators and learners and a common language of communication.

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Answer of this question was given by almost all the interviewees. Different interviewees were dealing in different branches of science. Interviewees were teaching biology, Physics, chemistry, mathematics and computer science. They had different teaching experiences. Few were teaching their related subject for long time and few were new in the field. Some were enjoying their teachings but some of them were facing difficulties. Experience and way of communicating science were the reasons behind this.

9.2. How Process of Communicating Science

From the interviews, the participants showed their view about how they experience of teaching science and communication about science.

T1 said “teaching *their students by using a whiteboard, books, and animation from mobile. Some of them were teaching the students through practical work by using Urdu and English in very easy form. I always try to know the natural phenomenon basics*”.

T3 said “*they communicate science by using entertainment, stories, ancient science discoveries, and modern technology. They also use a sense of humor to interact with students*”.

From the interviews, it is concluded that few teachers were teaching their students by using a whiteboard, books, animation from mobile. Some of them were teaching the students through practical work by using Urdu and English in very easy form. I always try to know the natural phenomenon basics. Three interviewees said they communicate science by using entertainment, stories, ancient science discoveries, and modern technology. They also use a sense of humor to interact with students. One interviewee said that he teaches his students by using a whiteboard, books, practical performance.

T4 said “*students by using a whiteboard, books, practical performance. Another teacher told that he communicates in experimental and practical language. Through practical works and experiments students learning are enhanced*”.

For example T9 “*there is a computer availability which promotes students and enhances learning and understanding skills because through the computer assisted communication of science includes audio video descriptions along with images and short animations regarding science literacy and inventions in the world of science that helps students to understand and build conceptual learning*”.

Very few teachers said that there is a computer availability which promotes students and enhances learning and understanding skills because through the computer assisted communication of science includes audio video descriptions along with images and short animations regarding science literacy and inventions in the world of science that helps students to understand and build conceptual learning’s.

9.3. Advantages of Science Communication To School Community

T1 believed “for students at secondary level, it has been discussed that society can be promoted through scientific instruments which are scientific inventions”.

T2 pointed out “*a main reach to moon and space can be possible due to scientific study and communication*”.

T4 said “*advancement in the field of medical and control of diseases can be possible by communication science and doing science*”.

T5 said “*Advancement in agricultural field and overcome of food deficiency in growing world all due to scientific innovations and its communication*”.

There are countless benefits of communicating science. Three interviewees believe that for students at secondary level, it has been discussed that society can be promoted through scientific instruments which are scientific inventions. One teacher pointed out that a main reach to moon and space can be possible due to scientific study and communication.

T9 said *“today world is called digital world and technology and computer are the innovations of science”*.

There are countless benefits of communicating science. Students can get benefit in their future life. Advancement in the field of medical and control of diseases can be possible by communication science and doing science. Advancement in agricultural field and overcome of food deficiency in growing world all due to scientific innovations and its communication. Today world is called digital world and technology and computer are the innovations of science.

Sub theme: Is the science communication beneficiary for students in practical life science opinion?

T1 said *“In the form of plants sciences and ecosystem etc.”*.

T2 said *“Students can get a lot of benefits in their practical life by science communications”*.

T3 said *“science is more effective and useful for students in their practical life”*.

Few said that advancement in the field of medical and control of diseases can be possible by communication science and doing science. Advancement in agricultural field and overcome of food deficiency in growing world all due to scientific innovations and its communication. One teacher said that today world is called digital world and technology and computer are the innovations of science.

T7 said *“Because of science life is surviving and life depends upon knowledge of science, so it’s very important”*

T13 said *“Science communication is the way of educating, informing, motivating the sense of wonder about scientific research and discoveries, giving knowledge of science and techniques used in science”*.

Through science communication, educational achievements and society development can be done. Science creates awareness to students in which direction they can move in future. This often results in published features. Things about education can influence student’s as well as public opinion, behavior and policy priorities. Science affects the lives of people such as vaccination, medical care, education, food, etc. In the event of a time bomb for parasite diseases such as COVID-19 and other health emergencies that pose a risk to populations and increase the health budget, effective public health care is of particular concern. Get a recent thesis which goes beyond words: Concentrate on the difference between new approaches to public health and practitioners / politicians' awareness. It is therefore important to link academia, industry and government in order to change the quality and improve the quality of life.

T14 said *“Increase knowledge of students. Practical work enhances practice of students on hand to hand activities”*.

T15 said *“You have an opportunity to understand life”*

Through science communication, educational achievements and society development can be done. Science creates awareness to students in which direction they can move in future. This often results in published features. Things about education can influence student’s as well as public opinion, behavior and policy priorities. Science affects the lives of people such as vaccination, medical care, education, food, etc. In the event of a time bomb for parasite diseases such as COVID-19 and other health emergencies that pose a risk to populations and increase the health budget, effective public health care is of particular concern. Get a recent thesis which goes

beyond words: Concentrate on the difference between new approaches to public health and practitioners / politicians' awareness. It is therefore important to link academia, industry and government in order to change the quality and improve the quality of life.

9.4. Difficulties in communicating Science at Secondary level

T3 said “*Various factors which affected communication negatively and considered as problems in communication*”.

T1 said “*One author enlisted three issues in communication namely, geographical distance, social and cultural distance and time distance. But when we investigated difficulties at school level we did not find these barriers in communicating science*”.

T5 said “*At school level teachers are not facing geographical issues however; they are facing cultural and social issues because within a school students belong to different communities and their backgrounds are also different*”.

If we look around the world in existing literature researchers debated on various factors which affected communication negatively and considered as problems in communication. One author enlisted three issues in communication namely, geographical distance, social and cultural distance and time distance. But when we investigated difficulties at school level we did not find these barriers in communicating science. There were some other difficulties that teacher were facing in communicating science. Teachers are not facing geographical issues however, they are facing cultural and social issues because within a school students belong to different communities and their backgrounds are also different. Some students belong to rich as well as well-educated families some come from medium families but some students belong to poor families and their parents are not well educated or even illiterate. These aspects of their background impact on student's attitude towards understanding of science communication with in class room as well as at their homes.

T11 said “*Some students belong to rich as well as well-educated families some come from medium families but some students belong to poor families and their parents are not well educated or even illiterate*”.

These aspects of their background impact on student's attitude towards understanding of science communication with in class room as well as at their homes. At school level teachers are facing difficulties in communicating science. Most difficulties are born from student's sides and institution side not from teacher's side.

10. Conclusions

The research findings confirmed that science communication skills and behavior, including challenge, encouragement and respect, of science teachers and learning dishonest cooperation and climate management had an effect on learning of science. In contrast, students who suggested that teachers modify their actions based on students' observations and diverse experiences, aspirations, skills, and abilities were different from the approach to approaching the science faculty relationships. Secondary level teacher had faced various difficulties in science communication. . To teach and communicate science is not so easy. At school level, lack of facilities and technology, lack of experience of teachers, lack of interest of students, only oral communication, and lack of practical activities are the difficulties in communicating science. Actually most of students belonged to rural areas so they were facing language issue. The main

difficulty which teachers had found was of language. Most students feel difficult to understand English terminologies. (ii) Less availability of resource material not project base learning. They said that Provide latest technologies for practical work .Which may increase the knowledge of students. By giving proper facilities and proper training to teachers, by performing activities, by increasing professional qualifications of teachers, by developing the interest of science education in students and by making proper environment for science communication, we can overcome these difficulties. They also agreed that science communication played important role in the life of student. Furthermore, Science is more effective and useful for students in their practical life.

11. Needs to the Future Study

Through questionnaire and interview data, this study focused primarily on what teachers had to say. Some of the above recommendations must now be implemented, which determines the scope of future research:

- Collect and evaluate science communication in order to foster autonomy in teachers so that they can use more effective techniques and formats
- Examine the most effective ways for teachers to communicate science to students and assess their effectiveness in practice

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