Sustaining Learners Interest in Physics: An Exploratory Study

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Abstract- *Students in science consider physics to be one of the most prevalent and difficult subject. During high school, if teachers cannot sustain learners' interest in physics, students drop out of physics for their further study. Keeping students interested in physics is essential to make learning more fruitful and enjoyable. One of the most important aspects of a student's success in physics is ensuring that they remain interested in the subject matter. The present study was an exploratory study on sustaining learner's interest in physics. This study collected teachers' views and understanding on sustaining learners' interest in physics. It had collected thoughts of 58 pre-service teachers and six in-service physics teachers from the Bhubaneswar locality. This study focused on finding the ways and means of sustaining learners' interest in physics. The factors that sustain students' interest in physics had also been examined. In this investigation, a descriptive survey method was used. An open-ended questionnaire and semi-structured interview as a tool were used for the present study. It had been found that learner-centric teaching-learning practices, adopting various strategies and approaches in teaching physics based on content, learner and context, utilizing learning resources and community resources for teaching physics, using ICT in physics teaching-learning practices etc. by the physics teachers can sustain the learner's interest in physics. The study's findings suggest implications for sustaining learners' interest in physics.*

Keywords**:** Learners Interest, Physics Learning, Teaching-Learning Practices.

Introduction

Physics is a natural science that underpins the technology and scientific advancement. It is an experimental science that seeks to observe, describe, model, and comprehend the natural environment. It is a science-based on reasonable expectations of how nature should act. It is a logical experience that motivates young people and expands our understanding of Nature (Laad, 2011). It has been observed that only few students enjoy physics in school. There are a lot of difficult materials in physics that students don't like to learn about. Teaching physics should be easier, more understandable, and even fun for students. Sustaining learner's interest in physics is relevant in education. Many people worldwide have complained recently about how poorly students do in Science and especially in Physics at both the tertiary level and in middle and high school (Keller et al., 2017). "Concerns have also been raised about the rapid decline in the

number of students taking Physics-based courses at the university level in both developed and developing countries (Gudyanga et al., 2015)". Students who aren't interested in or motivated to learn about Physics can make it more difficult for them to do well in Physics (Keller et al., 2017). This lack of interest and motivation could affect how the learners make decisions and act when they learn about Physics (Schumm and Bogner, 2016). As a result, we should concentrate our efforts on maintaining learners' enthusiasm in physics.

Rationale of the Study

Physics is regarded as the most challenging branch "of science, and it has traditionally attracted fewer students than other disciplines such as chemistry and biology" (Guido, 2018). The majority of learners thought of physics as a tough subject in secondary stage, which became more difficult in college and even more difficult in performing researches. The attitudes of students toward learning the subject impact their willingness to learn. The relationship between attitudes and motivation has long been a significant concern in learning. Students' attitudes toward physics should be measured in conjunction with "their attitudes toward the learning environment (Crawley and Black, 1992)". For a long time, motivation has been recognised as an important aspect in learning. Physics is taken by significantly fewer students "than any other science subject at the higher level of education" around the world (Osborne et al., 2003).

Students and the general public, including educators, agree "that Physics is a difficult subject" (Angell et al., 2004, Osborne et al., 2003). Physics has been determined to be losing popularity among students at all levels of study (Murphy and Whitelegg, 2006; Reid, 2003). "Factors affecting junior high school students' interest in Physics" was investigated by Richardo Trumper (2006). According to his research, students' concentration in physics is decreasing, which will significantly impact future generations' scientific literacy. The rationale for this is that a growing "body of evidence indicates that increased interest in a subject can boost students achievement (Hulleman and Harackiewicz, 2009)". It is impossible to overestimate the importance of maintaining students' enthusiasm in physics. If pupils do not desire to study, they will learn very little. Thus the purpose of this paper was to explore the possibilities of sustaining learner's interest in physics.

Research Questions

1. What are the views and understanding of teachers on sustaining learners' interest in physics?
2. What are the factors which influence the sustaining learners' interest in physics?
3. What are the different ways and means of sustaining learners' interest in physics?

Objectives of the Study

1. To study the views and understanding of teachers on sustaining learners' interest in physics.
2. To examine the factors which influence the sustaining learners' interest in physics.
3. To find out the different ways and means of sustaining learners' interest in Physics.

Methods and Procedure

The descriptive survey method was used to achieve the study's objectives. The present study was an exploratory study on sustaining learner's interest in physics. This study collected teachers' views and understanding on sustaining learners' interest in physics. The purposive sampling technique was utilised in this study. This study had collected thoughts of 58 pre-service teachers and six in-service physics teachers from the Bhubaneswar locality. An open-ended questionnaire and semi-structured interview as a tool were used for the present study. The researcher developed the tool, which was then validated by experts. The semi-structured interviews were purposely scheduled, and interviews were carried out face to face as well as telephonic and lasted between 30 to 45 minutes. The data gathered were analysed by using the qualitative analysis technique.

Results and Discussion

Participants' Views and Understanding on Sustaining Learners' Interest in Physics

This study had found that participants were sensitive towards sustaining the learner's interest in physics. They had discussed their strategies for motivating students to learn physics and encouraging them to pursue a career in physics by pursuing a higher level of education in the field. In the participants' opinion, learners are losing interest in learning physics have several reasons. The following are a few examples:

- Basic physics ideas are not well understood by learners
- Non-availability of well qualified and dedicated teachers
- Inability to create a link between their daily activities and physics
- Lack of ability to adapt their knowledge to new situations
- Poor infrastructure and ill-equipped laboratories
- No change in physics curriculum with rapid technological advancement
- Industry and academic needs are not properly aligned
- Limited seats available for higher study and physics research at major research institutes
- Inability to understand physics as the foundation for technological advancements
- Lack of awareness among students about career in physics

Participants' Suggestions for Sustaining Learners' Interest in Physics

This study found different suggestions from the participants to sustain learners' interest in physics. The major suggestions were:

- Identify students with aptitude and interest in physics and mentor them
- Need to train physics teachers for sustaining learner's interest in physics
- Need to clarify the scope of physics learning among the children
- Need to Nurture curiosity, creativity and aesthetic sense in physics among learners
- Selecting appropriate approach and strategy in teaching physics by teachers based on content, learner and context

- Allow high school students interested in physics to interact with senior scientists from prestigious research institutes to foster their curiosity and enthusiasm in higher education and research
- Provide financial aid, scholarships to students wishing to study physics in India and abroad.
- Teachers can teach physics concepts with the use of ICT and community resources

Factors Influencing the Sustaining Learners' Interest in Physics

This study found a range of factors that influences the quality and process of physics learning. These are divided into two categories: cognitive and affective factors. Information processing, reasoning abilities, and academic accomplishment are all cognitive factors. Attitude, self-efficacy, anxiety, and motivation are the affective factors that are stressed in the physics learning literature. Motivation is the affective factor in physics learning that is given more attention than the others. The three variables (behavioural, cognitive, affective, and biological events - personal and environment factors) frequently interact in the classroom. For instance, a teacher may offer a lesson to the class, and students may consider what the instructor says (environment influences cognition). Students who are having difficulty understanding a course topic raise their hands to ask the teacher questions (cognition influences behaviour). The teacher goes over the point again (behaviour influences). The teacher provides students exercises to complete at the end of the lecture (environment influences cognition which influences behaviour). Students believe they are doing an excellent job working on the task (behaviour influences cognition). The desire to learn physics is influenced by many factors. Inherent curiosity and inspiration and support from parents, friends, and physics teachers may be the cause of this phenomenon.

Different Ways and Means of Sustaining Learners' Interest in Physics Subject

This study found different ways and means of sustaining learners' interest in physics from the opinion of participants and from various kinds of literature.

- Improving present physics teachers' abilities, knowledge, and motivation
- To adopt appropriate approaches and strategies in teaching physics
- Encourage active student engagement in class discussions
- Teach students how to access the scientific information
- Make tough topics of physics more practical
- Develop problem-solving, inquiry skills, critical thinking among the students
- Create new physics-related technology courses and programmes
- Creating a better system of physics teaching-learning practices
- Using *Real-World* examples to make the physics lesson more interesting
- Proper planning of facilitating learning in physics
- Use of inventive tasks in physics teaching

Conclusion and Implications of the Study

Physics education in the twenty-first century strives to develop advanced reasoning abilities and a thorough understanding of fundamental concepts. According to several studies, learners who want to make a career in physics are less and fewer in recent years. The study of physics is essential to the development of any new technology. As a result, the world's economic engines are provided with the foundational information they require for future technological advancements. The popularity of this subject is declining for a variety of reasons. Poor preparation of students in science in middle school leads to poor performance in high school or before going to colleges. This situation has created more dropout of physics learners. In this connection, the present study's findings provide a comprehensive understanding of sustaining learner's interest in physics learning. Through this study, the student's interesting physics learning and factors which influence their interest had been identified. The findings of this study certainly lead teachers to design a better teaching-learning environment for students to sustain their interest in learning physics. The contribution of this study will lead teachers to better understand students' level of interest in physics learning.

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