Chapter V

Findings and Discussion

5.0 Introduction

As analysis and interpretation of the collected data are of significant value for any research work, debate on drawn findings and formulation of the conclusion is of utmost importance. These sections also demand keen observation and rational viewpoints. The previous Chapter elaborated, analysis of the data and its interpretation comprehensively. This Chapter presents significant findings concluded after the analyzed data's performance and a discussion in detail.

The researcher has attempted to organize and put forward in-depth discussion for the findings of the present work, with the support of reviewed literature and other related previous studies. The concluded results of the current work were organized objective wise, and the meticulous presentation of the same was attempted in the next section of this Chapter.

5.1 Major Findings of the Study

Findings drawn after the analysis of the collected data were detailed below, according to the study's objective.

Objective 1 states, "to develop Life Skill-based Activities in Science and Technology subject for class IX".

1. The first objective of this research was to develop Life skill-based activities on the topics of science and technology subject of IX standard. Fifteen topics from the science and technology NCERT book of IX class were selected. The program was developed considering the needs and demands of the students and the experiment. The expanded program includes activities based on the concept of knowledge integrated with life skill education to fulfil the demands of both subjects. The program consists of indoor and outdoor activities along with one field trip.
2. Drafting an activity-based program with an integrated approach (life skill education merged with science concepts) evidenced the verity that it is possible to outline content knowledge of any academic subject through life skill-based activities.

Objective 2 defines "to implement Life Skill-based Activities for class IX in Science and Technology Subject".

1. The developed program, which includes various Life skill-based activities, was implemented during the science period. The total time entailed during the experiment

was almost 1,770 minutes which provides for pre-test and post-test durations, excluding fieldwork timings.

2. During the implementation of the program, it was observed by the researcher that most of the students were enthusiastic for every next task and actively participated in most of the activities. Initially, few students felt shy and apprehensive while taking part in the training and were hesitant to introduce themselves voluntarily for the action. Later, after two activities, students found interest in the activities and felt confident while performing any responsibility.

The third objective of the present work outlined as "to study the effectiveness of life skill-based activities in terms of achievement of the students in science and technology subject" can be understood as the nucleus of the present research. The intended program was found to be successful in terms of achievement in science concepts on the following grounds:

1. The Mean achievement scores of the group taught through the program was 54.53, which was much higher than the mean achievement scores of the group (26.48) taught traditionally. The calculated U value was 0, and the Z value was 7.69, which was significant at 0.01 level of significance, which strongly validates the program's effectiveness concerning achievement in science and technology subjects. It could be concluded that students of the experimental group developed a better understanding of the science concepts after implementing the program.
2. On comparing mean achievement scores of pre-test (which was calculated as 22.175) with the scores of the post-test (calculated as 49.725) of the experimental group, it can be extrapolated that at the end of the experiment, students developed more clarity in science concepts taught through the life skill-based activities.
3. Similarly, a comparison of mean achievement scores of pre-test (20.35) and post-test (22.375) of the control group reveals that students taught through the traditional method didn't exhibit much improvement.

Data collected through five worksheets were analyzed and inferred to study the effectiveness of life skill-based activities in terms of improvement in life skills.

1. The results indicated an upward trend in the number of students under grade A with every progressive worksheet.
2. Similarly, there was a noticeable downward trend in the count of students under grades B, C, and D.

3. During the implementation of the activities, it was observed that in the first instance, most of the students were more comfortable communicating their learnings, needs, and priorities during discussion time, and some remained silent. Afterwards, all the students were open to each other and took part in every discussion comfortably. In some of the cases, students discoursed with each other and even with the researchers about their problems during the activities.

In response to the fifth objective of the study, an opinionnaire was developed, and collected data were evaluated with the help of thematic content analysis and calculated through frequency and percentage.

1. The findings revealed favourable responses from the students towards the developed program. According to them, the activities carried out during the program were meaningful and helpful in developing the science concepts.
2. Life skill education integrated with science topics helped students develop different skills necessary in life, such as communication, coping with stress, managing emotions, and interpersonal skills.
3. The activities proved to be an effective remedy for the students to understand the concept of science by observing, analyzing, and inferring the conclusion themselves. In other words, the use of different activities helps students understand and comprehend the concept more effectively and improve their life skills.
4. Students felt the teaching-learning process adopted during the program made concepts easier to grasp.
5. 95% of the students opined that learning through activities was an entertaining and delightful experience. According to them, Such activities help in developing a concentration in uninteresting topics also, as during any activity most of the students were engaged in one or another task.
6. When asked about adequacy regarding the number of activities taken under different topics, 40% of the students responded favorable.
7. More than 50% of the students marked all the activities as exciting and enjoyable.
8. 75% of the students believe that a better understanding of science concepts could also help develop most life skills.
9. Most of the students responded, a better understanding of the concepts and relating science concepts with daily life situations, in response to the question, "What changes do you perceive in yourself after the program in terms of your understanding of science concepts?"

10. A remarkable number of students commented that the program helped create interest in boring topics, developed an inter-personal relationship while knowing each other during the activities, developed teamwork and team management, enhanced communication skills, developed inquiry skills, creativity, and thinking skills.
11. More than 80% of the students believed that both the subjects (science and life skill education) could be proved as helping hand to each other for the better understanding of one another.

5.2 Discussion

With the support from different theoretical perspectives, workshop results, training programs, and educational courses in life skill education, it could be remarked that life skills are one of the most indispensable elements of today's education. Errecart et al. (1991), Caplan et al. (1992), Zollinger et al. 2003, Botvin et al. 2003, Yadav & Iqbal (2009), Roodbari, Sahdipoor & Ghale (2013), Puspakumara (2011), Deshmukh (2014) authenticated the above point when they found positive results in adolescents after the intervention of life skill education.

A list of research works has been made on the importance of life skill education in the school curriculum. Moshi, Hassanzade, & Taymoori, 2014; Pfiffner et al., 2007; Visser, 2005; Yankah & Aggleton, 2008 studied school education guidelines of various countries and found that number of countries have integrated life sill education in their school curriculum effectively. In the Indian education system, the Central Board of School Education initiated blending regular school curriculum with life skill education to make education more productive and skilful. In 2003-2004, CBSE instituted life skill education into its school curriculum through class VI. Since then, various commissions and reports in India have highlighted the significance of life skill education in all the stages of education. Descriptions of several renowned commissions such as NCF (2005), NCFTE (2009), and proposed NEP (2020) necessitated the urgent integration of life skill education at different levels of education. Various researchers such as Botvin (1985); Hudley & Graham (1993); Morton (1993); Buhs (2000); Baker & Rudd (2001); Weerts & Sally (2005) contributed their efforts in the same field by observing the effectiveness of life skill-based intervention program embedded in the school curriculum and concluded that students' confidence, anxiety, self-esteem, decision -making and social coping skills were strengthened through the program.

Similarly, the seriousness of the science and technology subject and its alarming status at the secondary level is undoubtedly an issue of concern. Aziz (1984), Umasree (1999), Pienyu (2004), Shukla (2005), Dey (2014); Lodh (2014); Karim (2018) & Tron (2018) studied the status of science education at different levels and found negative results. Most of the studies revealed that the lecture method used during teaching-learning of science and technology creates a monotonous classroom environment and drabness among students. Research work from Shamsudin et al. (2013); Pillai (2013); Mehta & Kulshrestha, (2014); Ahmad & Rai (2015); Katsampoxaki, & Fouskaki, et al. (2015); Kurbah (2015); Eisha (2020), focused on different strategies for teaching science and suggested some teaching-learning approaches such as Inquiry-Based Science Education, activity-based intervention program, and problem-based learning, for meaningful understanding of science and technology subject.

For the present work, the researcher tried to integrate both the subjects (science and technology subject and life skill education) and developed a program that would strengthen the content knowledge of science subjects and develop life skills. In the same line, Shin & McGee (2002), Gafoor & Shemi (2007), Venkatesh (2009); worked on the idea of integration of life skill education with different subjects to develop life skills. Through the present work, the researcher attempted to examine the effectiveness of life skill-based activities in the development of science concept understanding along with improvement in life skills. From the results, it is evident that the developed activity-based program could create a better account of science concepts among students. Further, the findings reported that the program was an effective tool in magnifying the concept clarity concerning science and technology. The statement was also supported by the findings of the research work by Gafoor & Shemi (2007), who worked on study skills to improve the achievement of students in biology subject.

According to Shukla (2005), Dey (2014); Lodh (2014); Karim (2018), and Masoom (2017), there were many reasons behind the declining science education, and foremost reasons include decreasing satisfaction of students with the teaching of science in the higher classes in school and most of the science teachers were found ignorant about innovations in science and lack in professional training and orientation courses meant for them. In most schools, completion of science syllabus was preferred over pedagogy, and experiments or practicals were performed only with those topics mentioned in science practical books. Such trends in science teaching brought about uninspiring and dullness in class-leading to students' lack of interest in the subject. It, therefore, becomes

indispensable to include enthusiasm and eagerness in the class to make students understand the concept by heart. The results from analysis of the present work revealed that students taught through life skill-based activities displayed enhanced comprehension skills and the development of interest and curiosity in science and technology subjects compared to the students taught through traditional methods. The studies carried out by Vardhini (1983); Anjaria (1984); Deopuria (1984); Mohapatra (1989); Joshi (1995); Mao et al (1998); Wolf & Fraser (2008); Kwatra (2000); Amin (2011); Bryan et al (2011); Nimavathi & Gnanadevan (2012); Mohammadpour (2012); Parekh (2012); Myrten (2013); Eisha & Khirwadkar (2017) also supported the above point. As reported by all these studies, with the help of different innovative approaches in science teaching and learning at the secondary level, scientific attitude, scientific skills, and content knowledge among students would be effortlessly developed.

Furthermore, the present study also evaluated the program's success in improving life skills among students of the experimental group. It was deduced after the analysis of the data collected during the experiment that the students improved their life skills after every progressive activity. The researcher also observed during the activities that students of the experimental group expressed more and enhanced skills with every subsequent task. Developed activities aided students to brush up their communication skills, problem-solving, and decision-making skills improved their stress and emotion management capabilities and helped them learn empathy over sympathy. This implies that students who got adequate self-learning experience through such activities were able to enhance their thinking skills and emotional and social skills to a greater extent.

It was also understood from the results of the present study that a higher percentage of students reported that almost all the activities were exciting and enjoyable, they learned concept clarity along with communication skills, the confidence of presenting themselves in front of anyone developed reasoning, logical and thinking skills, and skills related to interpersonal relationship and empathy got improved through teamwork.

The developed activities proved to be an effective remedy for the students to understand the concept of science by observing, analyzing, and inferring the conclusion themselves and the improvement in life skills. In other words, the use of different activities helps students understand and comprehend the concept more effectively and improve their life skills. This is to say that the integrated approach in teaching-learning boosted the conceptual understanding and enhanced essential skills for a successful life. On the same line, Baker & Rudd (2001); Shenoy (2005); Alias & Abd Hadi (2010); Mohamad &

Heong (2011) prepared a specific integrated curriculum that separately targets and enhances problem-solving skills, creative and critical thinking and observed remarkable results. Weerts & Sally (2005) employed films as a tool for refining necessary and creative thinking skills in students. Shenoy (2005) designed a model curriculum for most subjects and tried to integrate different skills for students to understand real problems and apply that understanding to find proper solutions. Ozaeta (2011) remarked that combining meaningful pedagogical methods (in-school and after-school) with life skills would yield desired results in youth development programs. In the present study, similar results were concluded, as students developed motivation, confidence, self-analysis, interpersonal relationships, team management and teamwork, empathy.

An ample of studies showed that any variation from a regular classroom in science teaching would yield remarkable results. Being an integrated approach to science learning, the current research undoubtedly boosted science concepts knowledge along with skills and competencies essential to face life's challenges. Undoubtedly, these programs take time, and schools are limited with time, as they have to complete syllabus and other nonformal curricula. Still, with time management, such programs could yield remarkable results. As most of the activities were of a self-learning nature, they helped students develop scientific skills by self-inferring. Students framed their concept knowledge by themselves. During the discussion, time elaborated their understanding of the concept with illustrations from everyday life, which helped them make the relationship better between the two.

In general, students have a favourable opinion towards the developed program. According to the students, the program helped them develop communication skills, a better understanding of the concepts, inquiry, problem-solving skills, creative and critical thinking skills, and developed motivation and interest in science and technology subjects. They added that they learned to relate science concepts with daily life situations, resulting in clarity of the concepts and better understanding. During the implementation of the program, students were always ready to take the task and consistently completed every single job within time. Seventy per cent of students responded that all the activities were relevant and exciting concerning a thorough understanding of the science concepts. Eighty-five per cent of students remarked that these activities developed curiosity while teaching. Overall, Students found activities playful, fun-filled, and enjoyable.

Khatoon (2015) observed that the focus of the current education system is on what the child doesn't know rather than on what the child knows. The child's achievement and

performance are more stressed than knowledge and skills, by the teachers, parents, in public school and society. The utmost attention of any school always remains to impart academic knowledge of subjects, whether it is science, mathematics, social science, or any issue. Lack of trained teachers and all set curricula are also challenges for the school to introduce innovative teaching-learning styles for the students. The present study attempted to develop a program that would eventually enhance understanding of science concepts not for the achievement but the knowledge and prepare students to face life challenges with the help of life skills.

Conforming to the obtained results of the study, it could be stated in the similarity of all the studies reported in this research work. This integrated approach (Life skill-based activities) has promising results for improving life skills and the success of science education.

5.3 Conclusion

From the above discussion, it could easily be inferred that the developed program was a successful initiative by the researcher as an integrated technique for improving science teaching-learning and enhancing life skills among students. The all-embracing positive feedback from the students during the program's implementation and even after the analysis of the records documented success for this integrated approach.

This Chapter presented a comprehensive discussion on the present research findings with the support of reviewed research work. The summary of the complete analysis is detailed in the next Chapter.