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Effectiveness of Experiential Learning on Higher Order Thinking Skills and Scientific Temper in Secondary Science: An Empirical Analysis

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ABSTRACT

Science education in the 21st century has shifted from mere knowledge transmission to the fostering of active, Experiential and inquiry-based learning. In the secondary school curriculum, science is crucial for developing logical reasoning and a deeper understanding of the natural world. Despite this, traditional, rote-based pedagogy still dominates many classrooms, leaving students passive recipients of information. To combat this, modern educational frameworks, including the NEP-2020, strongly emphasize "learning by doing" or experiential learning (EL) to transform the pedagogical landscape. Experiential learning, grounded in Kolb's theory, involves learning through direct experience and active reflection, making the educational process personal and meaningful. With the increasing complexity of technological and scientific advancements, there is an urgent need to cultivate Higher-Order Thinking Skills (HOTS)—critical thinking, analytical reasoning, and creative problem-solving—rather than simple memorization. Parallel to this is the development of scientific temper, defined as a rational, open-minded approach that relies on evidence, testing, and inquiry to dispel superstitions and dogmas. The integration of these competencies is essential to prepare secondary students for real-world challenges. While various studies acknowledge that experiential learning positively affects overall academic achievement, there remains a research gap regarding its specific, empirical impact on the development of HOTS and scientific temper simultaneously. There is limited empirical evidence comparing structured experiential learning interventions against traditional pedagogies in secondary science to measure the enhancement of scientific temperament, scientific bent of mind specifically regarding respect for evidence, integrity, and perseverance. Many studies lack data-driven comparisons of these specific variables. This empirical study aims to bridge this gap by analyzing the effectiveness of an experiential learning approach on the development of Higher-Order Thinking Skills and Scientific Temperament in secondary school students. It moves beyond theoretical discussions to provide data-driven evidence on how "doing and reflecting" affects student cognitive skills and scientific attitude.

Keywords: Experiential learning, Science, Higher Order Thinking Skills, Scientific temper, Secondary students

INTRODUCTION

In modern science education, the transition from rote memorization to active inquiry is essential for preparing students to navigate a complex, data-driven world. Traditional pedagogical practices often fail to develop the cognitive agility required for scientific innovation, leaving a gap in students' ability to apply theoretical knowledge to real-world challenges. This study examines how Experiential Learning (EL), a methodology centred on direct experience and focused reflection serves as a catalyst for developing Higher Order Thinking Skills (HOTS) and a robust Scientific Temper in secondary school students.

Grounded in David Kolb's Experiential Learning Theory (1984), experiential learning approach defines learning as "the process whereby knowledge is created through the transformation of experience". It involves a four-stage cycle: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. The first two stages of the cycle involve grasping an experience, the second two focus on transforming the

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experience. Kolb argues that effective learning is seen as the learner goes through the cycle, and the speciality of this model is that the learner can enter the cycle at any time. NEP (2020) framework in Part-I chapter 4 *Curriculum and Pedagogy in Schools: Learning Should be Holistic, Integrated, Enjoyable, and Engaging*, under sub clause 4.6 writes "In all stages, experiential learning will be adopted, including hands-on learning, arts-integrated and sports-integrated education, story-telling-based pedagogy, among others, as standard pedagogy within each subject, and with explorations of relations among different subjects. This "learning by doing" approach also builds important life skills like teamwork and communication, making learning more engaging, relevant, and memorable for students. Research highlights several findings and practices of experiential learning in science classes, including study by Raina (2019) on Improving Science learning through Experiential hands-on activities revealed that there was significant difference in the scholastic achievement of the students and significant effects on student knowledge gain for those who followed experiential hands-on activities. Rani & Kumar (2023) studying on Experiential learning in school education: Perspectives and challenges, highlights the significance of experiential learning, challenges in the effective implementation of experiential learning in the teaching-learning process, suggestive measures to overcome these challenges and concludes that though several initiatives have been taken by Govt. of India to promote the implementation of experiential learning in school education, still it takes sincere attention in this regard

Based on Bloom's Taxonomy, Higher-Order Thinking Skills (HOTS) move beyond simple recall to encompass Analysis, Evaluation, and Creation. They enable students to solve novel problems and critique scientific claims. HOTS represent higher levels of thinking where individuals apply, connect, and generate new ideas from existing knowledge, rather than just recalling facts. These transferable skills are crucial for lifelong learning, critical thinking, and navigating complex situations in real life.

Scientific Temper, coined by Jawaharlal Nehru, refers to an "attitude of logical reasoning, questioning, and seeking evidence". It includes traits such as objectivity, scepticism, and intellectual honesty. Scientific temper is a rational and questioning attitude towards life and problems, characterized by open-mindedness, a reliance on evidence-based reasoning, and a willingness to revise beliefs considering new information. It involves applying scientific methods such as questioning, hypothesizing, testing, and analysing to make informed choices and solve problems as mentioned by Nehru (1946) in his book "*The Discovery of India*".

By shifting the learner from a "watcher" to a "doer," experiential learning seeks to foster not just better science students, but more rational, evidence-based citizens.

Rationale of the study

The study is aimed to address the urgent need to shift from rote learning to active engagement in secondary science, aimed at bolstering Higher Order Thinking Skills (HOTS) and fostering scientific temper. It aims to empirically address the gap between expected science achievement and current student performance, as highlighted by National Achievement Surveys (NAS) 2021 reports. There is the need for pedagogical shift as the conventional, lecture-based instruction is inadequate for fostering the analytical, creative, and critical thinking skills essential for scientific inquiry. There is the need for concrete empirical analysis confirming that experiential learning, learning by doing, improves science achievement. The National Achievement Surveys (NAS) 2021 reports indicate unsatisfactory student performance in higher-order thinking and application of concepts, demanding a shift to more engaging pedagogies. This study aims to provide, through data, a foundation for implementing experiential methods to improve critical thinking, analytical skills, and overall engagement in secondary science. It also addresses the necessity to foster critical aspects of scientific temper (e.g., curiosity, objectivity, and persistence) among students.

Statement of the Problem

Despite the emphasis on science in the National Education Policy (NEP 2020), secondary education frequently remains textbook-centred. This reliance on "passive learning" suppresses curiosity and limits the development of a scientific mindset. While previous research confirms EL improves academic achievement, there is a significant lack of empirical data on its specific impact on the multi-dimensional aspects of HOTS and Scientific Temper in the secondary science context.

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Objectives of the Study

- To study the effectiveness of experiential learning over conventional approach on higher order thinking skills in science at secondary level.
- To study the effectiveness of experiential learning over conventional approach on scientific temper in science at secondary level.

Hypotheses of the Study

- H01: There is no significant difference in Higher-Order Thinking Skills (HOTS) between students taught through experiential learning and those taught through conventional methods.
- H02: There is no significant difference in scientific temper between students exposed to experiential learning and those taught through conventional methods.

METHODOLOGY

To empirically test the impact of Experiential Learning (EL) on student outcomes, this study follows a rigorous Quasi-Experimental Research Design. This methodology is preferred in educational settings where the random assignment of individual students is impractical, allowing the researcher to work with pre-existing classroom groups.

The specific procedures are as follows:

1. Research Design

2. Sample and Sampling Technique

- Participants: Grade IX students from secondary schools.
- Technique: Purposive or Convenient Sampling is used to select schools, followed by the assignment of intact sections as the experimental and control group by following cluster random sampling.

3. Instructional Intervention (The "Treatment")

The experimental group engages in a 12-week module where each topic follows the four stages of EL:

- Concrete Experience: Hands-on lab experiments, field trips, or simulations (e.g., conducting action-reaction experiment to learn Newton's 3rd Law of Motion).
- Reflective Observation: Using group discussions on various questions related to different chapters of science to "think about the doing".
- Abstract Conceptualization: Connecting observations to scientific laws and theories.
- Active Experimentation: Designing new experiments or applying concepts to solve novel problems.

4. Data Collection Tools

Two primary instruments are administered before and after the intervention:

- HOTS Assessment Test: A researcher-developed science test focused on Analysis, Evaluation, and Creation.
- Scientific Temper Scale (STS): A standardized Likert-type scale measuring dimensions like Curiosity, Objectivity, open mindedness, Rationality, and Scepticism. Examples include the Scientific Temper Scale by Prof. N.A. Nadeem and S.R. Wani.

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5. Statistical Analysis

Data is analysed using software like SPSS or MS Excel:

- Descriptive Statistics: Mean and Standard Deviation to compare baseline and final scores.
- Inferential Statistics: Independent samples t-tests to determine the significance of difference between the two groups, and Pearson's Correlation to find the relationship between HOTS and Scientific Temper.

Research Design

The study employs a Pre-test/Post-test Control Group Design.

- Experimental Group: Receives instruction via the Kolb Experiential Learning Cycle (Concrete Experience → Reflective Observation → Abstract Conceptualization → Active Experimentation).
- Control Group: Receives instructions via conventional, teacher-centric lecture methods.

Sample and sampling techniques

- Participants: Grade IX students from secondary schools.
- Technique: Purposive or Convenient Sampling is used to select schools, followed by the assignment of intact sections as the experimental and the control group.
- Intact groups are taken so that the classes can be taken in the school set up without hampering the regular school time table as the classes continued for some months.

Research Instruments

To ensure the study is "data-filled" and scientifically rigorous, the research instruments must be validated and reliable. In this study, we use a triangulated approach involving a quantitative test, a psychometric scale, and a qualitative observation rubric.

Higher Order Thinking Skills (HOTS) Assessment Test

This is a criterion-referenced test designed to move beyond simple recall (Knowledge/Understanding). It focuses on the top three tiers of Bloom's Taxonomy.

Component	Target Skill	Item Example
Analysis	Identifying patterns & motives.	*"Based on the provided graph of velocity-time, determine the acceleration and explain why acceleration is zero when velocity-time graph is parallel to time axis"*
Evaluation	Judging the validity of data.	*"A body can accelerate even when its speed is constant, explain how it happens."*
Creation	Producing original work/plans.	*"Design an experiment using only household items to demonstrate the principle of electromagnetism to a primary school student."*

- Validation: Content validity is established by a panel of three subject matter experts (SMEs).
- Reliability: Calculated using Cronbach's Alpha

Scientific Temper Scale (STS)

A 5-point Likert Scale (Strongly Agree to Strongly Disagree) is used to quantify the "mindset" of the students. This scale is adapted from standardized tools like those by Nadeem (2012) and Singh J. (2016).

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Dimensions measured:

1. Open-mindedness: Willingness to change one's mind in the face of a new evidence.
2. Openness to new information: being receptive to novelty, ideas, and experiences that differ from established preferences or previous knowledge
3. The approach to problem solving and decision making: involves a structured, multi-step process defining the issue, analysing root causes, brainstorming alternatives, evaluating options, selecting the best course of action, and implementing the solution.
4. The ability to question assumptions: a core critical thinking skill that involves identifying, analysing, and challenging the unstated beliefs, premises, or "taken-for-granted" truths that underpin arguments, decisions, and everyday thinking.
5. To evaluate an individual's Inclination towards rational evidence based thinking: assessing their propensity to base beliefs, decisions, and actions on logic, objective facts, and credible data rather than on emotions, biases, or intuition.
6. To access the tendency to seek diverse perspectives: This competency indicates a shift away from confirmation bias and "echo chambers" towards cultivating an inclusive and innovative mindset.
7. Explain the awareness of emotional biases: the ability to recognize how personal feelings, beliefs, and temporary moods unconsciously influence decisions, judgments, and perceptions.

Sample Item: *"I am willing to change my opinion about a scientific fact if a new experiment proves my previous belief wrong."*

Data Analysis:

Higher Order Thinking Skills (HOTS)

- The following table illustrates **the mean scores (out of total mark of 40)** for both groups before and after the intervention.

Aspect of HOTS (40)	Pre-Test (Exp)	Post-Test (Exp)	% Gain (Exp)	Pre-Test (Ctrl)	Post-Test (Ctrl)	% Gain (Ctrl)
Analysis (14)	7.28	9.06	24.45%	6.86	7.31	6.56%
Evaluation (14)	7.13	8.86	24.26%	7.2	7.9	9.72%
Creation (12)	6.06	8.58	41.58%	6.08	7.0	15.13%
HOTS	20.522	26.522	29.23%	20.156	22.222	10.25%

Statistical Significance

Using the t-test for independent samples, the calculated value for the post-test scores was **3.838** The result yielded, indicating that the improvement in HOTS was not due to chance but was a direct result of the experiential intervention.

Descriptive Analysis of Pre-test and Post-test of Experimental and control Group on HOTS

To have an understanding on the distribution of data, mean, standard deviation and standard error of mean were calculated from the collected data at pre-test and post-test of both the groups.

Table 1: Descriptive measures on pre-test data of experimental and control group

Pre Test	Experimental Group	Control Group
Statistics	HOTS	HOTS
N	46	45
Minimum	9	8
Maximum	33	31
Mean	20.522	20.156
Standard deviation	6.0800	5.7681

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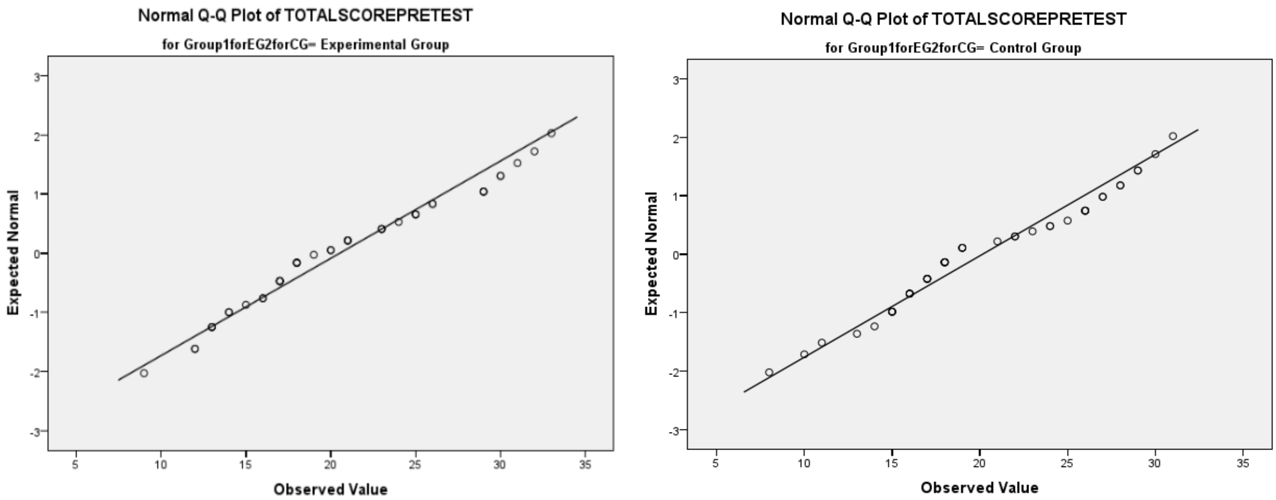
Shapiro Wilk P	0.960	0.957
Standard Error of Mean	0.8964	0.8599
Kolmogorov-Smirnov	0.139	0.157

From the above table on descriptive measures of pretest data of experimental and control group, data shows that there are 46 members in Experimental group and 45 members in control group. The mean score of experimental groups in higher order thinking skills test was 20.522 and that of control group was 20.156. The minimum score of experimental groups is 9 where as that of control group is 8. The maximum score of experimental groups is 33 and that of control group is 31. The standard deviation of scores in pre-test of experimental group is 6.0800 and that of control group is 5.7681. This indicates the variance is minimum in the data set of both the groups. The standard error of mean of total scores of experimental groups is 0.8964 and that of control group is 0.8599 which means the sample mean will resemble to that of population mean. Shapiro Wilk test as well as Kolmogorov-Smirnov test was carried to check on normality of the data set. The Shapiro Wilk probability value of experimental group came 0.960 and that of control group was 0.957. The Kolmogorov-Smirnov Normality value of Experimental group is 0.139 and that of Control group is 0.157 which means both the data set are normally distributed.



Experimental Group Control Group

Fig1.Q-Q plot on pre test score of Experimental and Control group

The Q-Q plot on pre-test score of experimental and control group depicts that both the data set are normally distributed.

Descriptive Analysis of Pre-test and Post-test of Experimental and control Group on HOTS

Table 2: Descriptive measures on pre-test data of experimental and control group

Pre Test	**Experimental Group**	**Control Group**
Statistics	HOTS	HOTS
N	46	45
Minimum	16	10
Maximum	36	31
Mean	26.522	22.222
Standard deviation	5.2057	5.4809
Shapiro Wilk P	0.961	0.951
Standard Error of Mean	0.7675	0.8170
Kolmogorov-Smirnov	0.099	0.169

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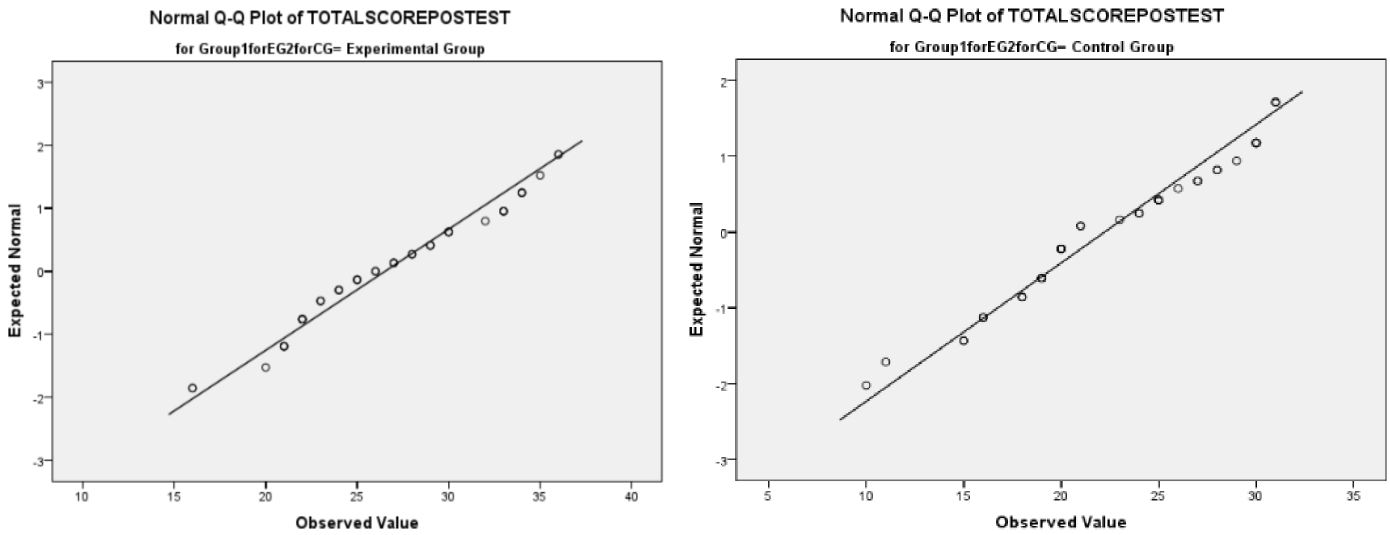
From the above table on descriptive measures of post test data of experimental and control group, data shows that there are 46 members in Experimental group and 45 members in control group . The mean score of experimental groups in higher order thinking skills test was 26.522 and that of control group was 22.222. The minimum score of experimental groups is 16 where as that of control group is 10. The maximum score of experimental groups is 36 and that of control group is 31. The standard deviation of scores in pre-test of experimental group is 5.2057 and that of control group is 5.4809. This indicates the variance is minimum in the data set of both the groups. The standard error of mean of total scores of experimental groups is 0.7675 and that of control group is 0.8170 which means the sample mean will resemble to that of population mean. Shapiro Wilk test as well as Kolmogorov-Smirnov test was carried to check on normality of the data set. The Shapiro Wilk probability value of experimental group came 0.961 and that of control group was 0.951.The Kolmogorov-Smirnov Normality value of Experimental group is 0.099 and that of Control group is 0.169 which means both the data set are normally distributed.



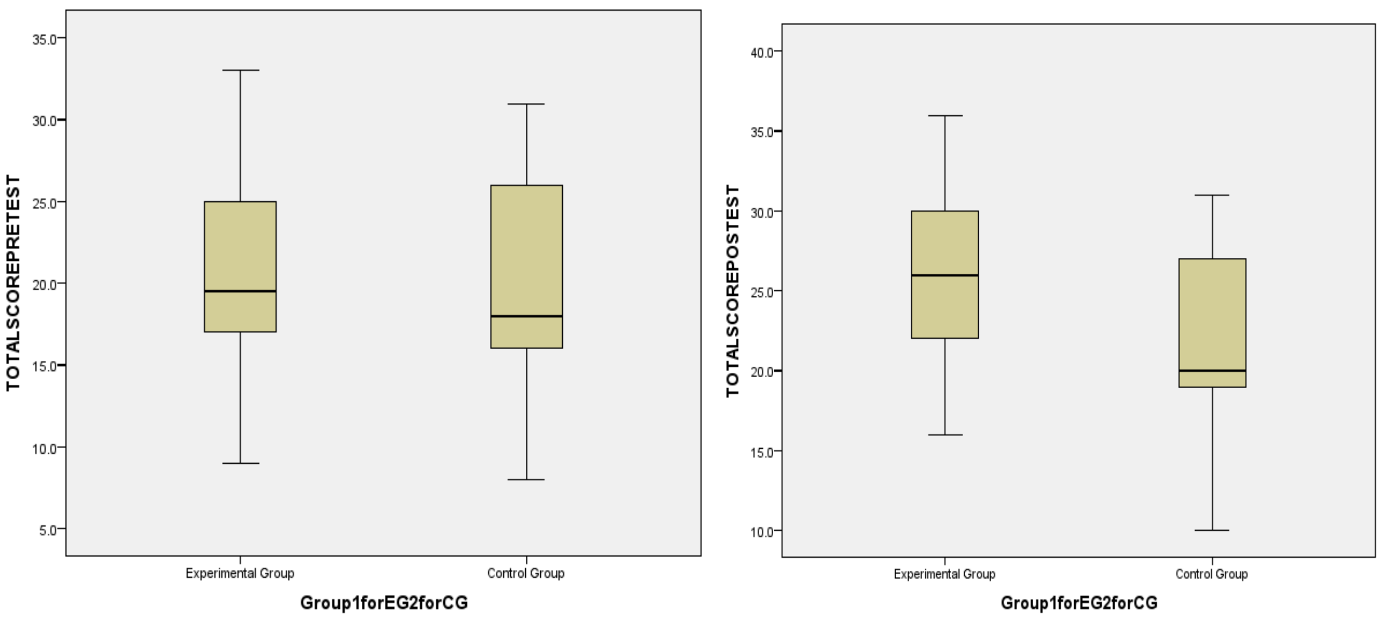
Experimental Group Control Group

Fig1.Q-Q plot on post test score of Experimental and Control group

The Q-Q plot on post-test score of experimental and control group depicts that both the data set are normally distributed.

Box plot

Pre test scores **Post test scores**



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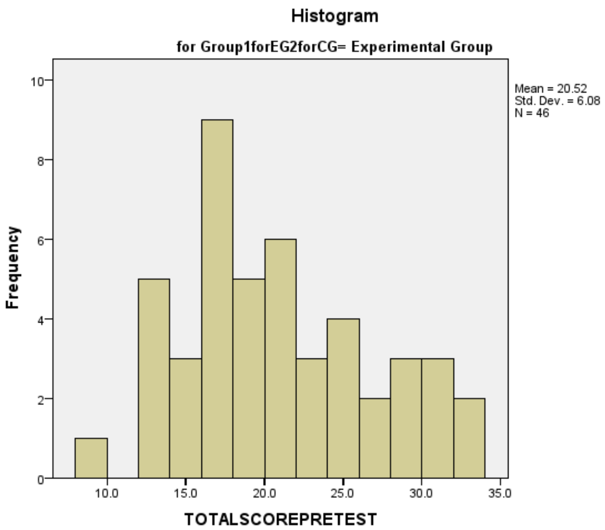
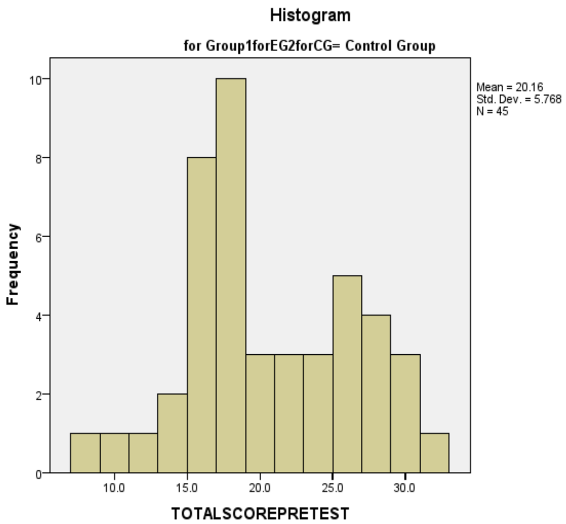
Histograms

Pre test Scores

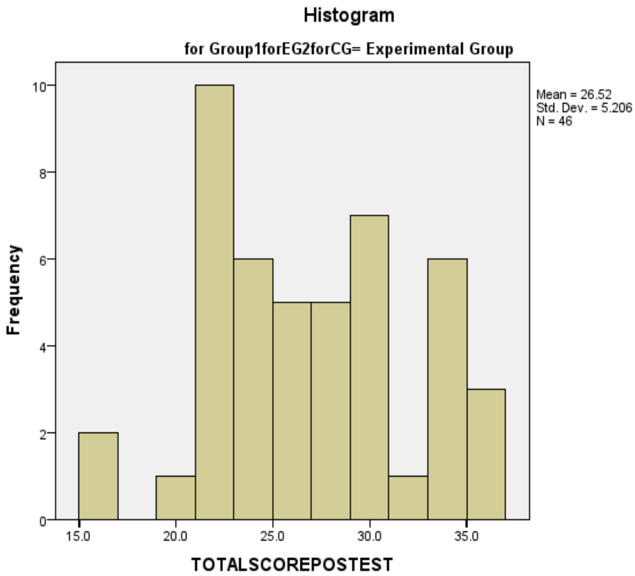


Experimental group

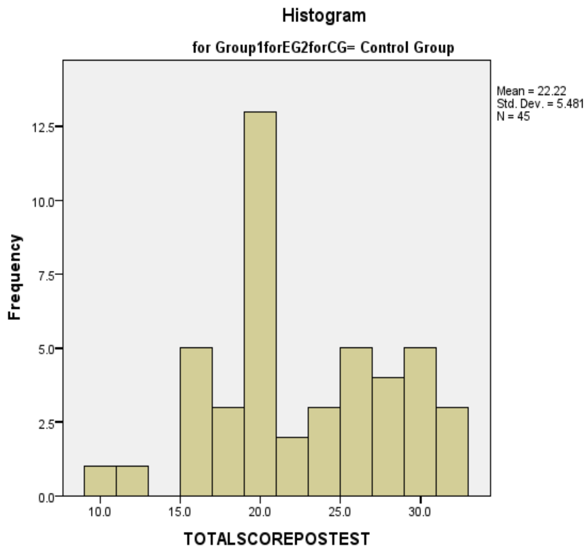


Control group

Post test Scores



Experimental group



Control group

Comparison of pre-test and post-test performance on HOTS between experimental and control group

To analyse whether any significant difference exists between the two groups which has gone through the intervention and which has not, independent sample t-test was used on both the pre-test and post-test data.

Table 3: Independent sample t-test on pre-test of both experimental and control group

Variables	Group	N	Mean	SD	df	t-value	Sig.
HOTS	Experimental	46	20.522	6.0800	89	0.2944	0.769
	Control	45	20.156	5.7681			

Table 3, depicts the t-value of both experimental and control group on pre-test score on higher order thinking skills. The reported t value was 0.2944 which is not significant at 0.05 level of statistical significance. Thus, it

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can be concluded that there is no statistical significance between the average performance of experimental and control group that is both the groups are equivalent before starting of the experiment.

Table 4: Independent sample t-test on post-test of both experimental and control group

Variables	Group	N	Mean	SD	df	t-value	Sig.
HOTS	Experimental	46	26.522	5.2057	89	3.838	0.00023
	Control	45	22.222	5.4809			

Table 4, depicts the t-value of both experimental and control group on post-test on higher order thinking skills. The reported t value was 3.838 which is significant at 0.001 level of statistical significance. Thus, it can be concluded that the null hypothesis framed earlier i.e. there is no statistical significance between the mean score of experimental and control group is rejected. Thus, the better performance of experimental group over control group on higher order thinking skills is not due to any chance factor rather because of the differential treatment.

Key Findings:

The most significant jump occurred in the "Creation" category, suggesting that experiential learning empowers students to synthesize new ideas rather than just recall facts.

Data Analysis: Scientific Temper

Scientific Temper was measured across four key dimensions. Scores represent the mean average of the group.

Dimension of Scientific Temper	Pre-Test (EG)	Post-Test (EG)	Improvement of EG (Mean Diff)	Pre-Test (CG)	Post-Test (CG)	Improvement of CG (Mean Diff)
Open mindedness	5.97	7.21	+1.24	5.97	6.4	+0.43
Openness to new situations	3.18	4.56	+1.38	3.11	3.13	+0.02
Approach to problem solving and decision making	2.10	3.10	+1.0	2.11	2.51	+0.40
Ability to question assumptions	2.15	4.02	+1.87	2.13	2.64	+0.53
Ability to evaluate an individuals inclination towards rationale evidences	2.04	3.08	+1.04	2.02	2.42	+0.40
Ability to access the tendency to seek diverse perspectives	0.80	1.5	+0.7	0.77	1.26	+0.49
Ability to the awareness of emotional biases	2.02	3.28	+1.26	2.02	2.17	+0.15

Comparison of pre-test and post-test performance on Scientific Temper between experimental and control group

To analyse whether any significant difference exists between the two groups which has gone through the intervention and which has not, independent sample t-test was used on both the pre-test and post-test data.

Table 5: Independent sample t-test on pre-test of both experimental and control group

Variables	Group	N	Mean	SD	df	t-value	Sig.
HOTS	Experimental	46	18.2174	2.41213	89	0.1232	0.9023
	Control	45	18.1558	2.37368			

Table 5, depicts the t-value of both experimental and control group on pre-test score on scientific temper. The reported t value was 0.1232 which is not significant at 0.05 level of statistical significance. Thus, it can be concluded that there is no statistical significance between the average performance of experimental and control group i.e both the groups are equivalent before starting of the experiment.

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Table 6: Independent sample t-test on post-test of both experimental and control group

Variables	Group	N	Mean	SD	df	t-value	Sig.
HOTS	Experimental	46	26.1057	5.2057	89	12.93	0.0000
	Control	45	20.5556	5.4809			

Table 6, depicts the t-value of both experimental and control group on post-test on scientific temper. The reported t value was 12.93 which is significant at 0.0000 level of statistical significance. Thus, it can be concluded that the null hypothesis framed earlier i.e. there is no statistical significance between the mean score of experimental and control group is confidently rejected. Thus, the better performance of experimental group over control group on higher order thinking skills is not due to any chance factor rather because of the differential treatment.

Key Findings:

The improvement in Scientific Temper was not by chance but was a direct result of the experiential intervention.

RESULT AND DISCUSSION

The data indicates a robust correlation between active engagement through experiential learning and cognitive depth leading to the development of HOTS and Scientific Temper. The descriptive analysis of the pre-test data showed that the minimum score obtained by the experimental group was 9 and that of control group was 8 whereas the maximum score obtained by the former group was 33 and the later one was 31. The difference between mean score of experimental and control group was 0.366, which is very negligible. From table 3, while comparing the mean performance of both experimental and control groups at pre-test the t-value came 0. 2944 at df 89, which is not significant at 0.05 level of significance. Thus, from the analysis, it can be concluded that both experimental and control group were equivalent from the perspective of performance in higher order thinking skills before the intervention. From the descriptive analysis of post-test data, the minimum performance of experimental group was 16 and maximum performance was 36 which showed a remarkable progress than the pre-test. The difference between mean performance of experimental group and control group was found to be significant at 0.001 level of significance (t-value = 3.838 with df 89). The Q-Q plots reflected that the pre-test and post-test data were normally distributed that means the findings of the present study is generalizable to the entire population. Thus, it is accepted that the Experiential learning method has a significant effect on development of higher order thinking skills among secondary students in science. The present study's findings were found to be similar with the study carried out by Sharma & Singh (2023) to investigate the effect of experiential learning technique on achievement in science of IX grade students revealed that the achievement in science of group exposed to experiential learning technique was significantly better than that of group taught through traditional technique. Imro'ah (2022) studying on efforts to increase understanding of the concept of simple electric circuits with experiential learning models in class VI concludes that experiential learning is a model of the teaching and learning process that activates learners to build knowledge and skills through direct experience. Article by Yuliana et al (2025) on effectiveness of experiential learning on students' understanding of science and technology concluded that the experiential learning model is very effective for developing the understanding of science and technology. Study by Joshua et al (2023) on the effectiveness of experiential learning approach on students' academic achievement in Biology in Secondary Schools concluded that experiential learning approach is an effective method of teaching a science subject and teachers engage students in this approach and motivate them to pursue science. Study by Mund (2024) on effectiveness of experiential learning on Integrated Science Process Skills among Secondary School Students revealed that the students usually have a low level of integrated science process skills and when the experiential learning program adapted from Kolb's learning cycle model was incorporated, the integrated science process skills of the learners improved. So here it can be concluded that the result of the present study was in line with the previous studies.

HOTS: Students in the experimental group outperformed the control group by nearly **2.73:1** in "Creation" tasks. This is attributed to the "Reflection" phase of experiential learning where students trouble shoot real-world variables.

Scientific Temper: The rise in mean difference in open mindedness is **+0.43** and in the ability to question assumptions is **+0.53** which suggests that when students collect their own data, involve themselves in experiential learning they become less reliant on anecdotal evidence and more reliant on empirical proof and their scientific temper improves significantly. With a t-value of **12.9313** and **89 degrees of freedom (df)**,a standard two-tailed t-distribution table or a statistical calculator gives a probability (p)-reported as **< 0.0001.** Since the p-value is much lower than the standard significance level ($\alpha = 0.05$),the experimental group has a significantly higher mean compared to the control group.

Educational Implications

Experiential learning in secondary science significantly boosts student achievement, retention, and engagement, fostering Higher-Order Thinking Skills (HOTS) and a scientific temper better than traditional methods. It shifts the focus from rote memorization to active inquiry, enhancing critical thinking, problem-solving, and scientific attitudes like curiosity and persistence. The key educational implications include Shift from purely content-focused syllabi to activity-based modules that require students to engage directly with scientific phenomena, fostering inquiry rather than passive listening. Teachers must shift from "lecturers" to "facilitators" or "scaffolds," designing hands-on experiences that allow students to explore, analyze, and reflect on their findings, thus fostering higher-order skills. Experiential learning fosters scientific attitudes such as scepticism, honesty in reporting data, respect for evidence, and perseverance, essential for scientific inquiry. It is seen that Students who engage in practical, hands-on scientific experiments show significantly better retention of concepts compared to those taught through lectures, making learning more meaningful and durable. Learning is linked to real-world scenarios, which improves students' problem-solving capabilities and demonstrates the practical relevance of science. Experiential approaches can be especially beneficial in diverse settings (e.g., in tribal schools), bridging gaps in learning styles and improving science performance regardless of initial ability. Experiential learning move beyond standard pen-and-paper tests toward evaluating process skills, project work, and the ability to reflect on scientific experiences, measuring true conceptual understanding. These implications suggest that implementing experiential learning is a crucial step towards developing a generation that is critically thinking, scientifically curious, and having well-rounded students in secondary science. The present study found that adopting experiential learning method as an instructional method abled to develop higher order thinking skills among secondary science students. This study calls for the researchers and academicians to carry out further researches to understand the effect of experiential learning on different dimensions of learning. Again, it empowers the teaching community to use experiential learning in their teaching to bring more effectiveness to their teaching and enhanced cognitive abilities among the students.

CONCLUSION

The experiential learning approach provides a wide variety of opportunities for students to explore their learning, enhance the knowledge, boost their autonomous learning, foster successful student-student interaction, and engage them in higher order thinking skills. The present study was focussed on exploring the effectiveness of experiential learning method on developing higher order thinking skills and Scientific temper of students of Class IX in Science, specifically for fostering the critical thinking skills required for modern STEM careers. The group taught through this method was found to achieve better performance which was statistically significant at 0.001 level of significance. Thus, the study is devoted to enrich the research literature on experiential learning in developing higher order thinking skills as well as scientific temper among secondary science students. Though a single school was used for the present study still the results can be generalised for all as it has taken all aspects into consideration.

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