

CHAPTER III

METHODOLOGY

3.1.0 INTRODUCTION

A crucial component of any research project is the research methodology. It considers every action the investigator took during the study process as well as the reasoning behind it. The methodology provides a detailed overview of the study's general design. This is a modest attempt on the part of the investigator to describe the methodology employed in the current investigation. The experiment's design, population, sample, and sampling approach, as well as the details of the tools and techniques used, the steps taken in data gathering, and the data analysis process, are all further explained in this chapter.

3.2.0 RESEARCH DESIGN

The current study falls under the umbrella of experimental research, where the investigator intended to enhance the creative thinking skills among secondary school students through incorporating strategy in the teaching of English. The investigator chose a quasi-experimental design as random assignment to the control and experimental groups was impractical. The investigator equalized the groups based on English pretest performance in order to strengthen the study. The study's design can be summed up as follows:

$$\begin{array}{ccc} \mathbf{O_1} & \mathbf{X} & \mathbf{O_2} \\ \mathbf{O_3} & \mathbf{C} & \mathbf{O_4} \end{array}$$

Where, $\mathbf{O_1}$ and $\mathbf{O_3}$ were pretest,

$\mathbf{O_2}$ and $\mathbf{O_4}$ were posttest

\mathbf{X} stands for Experimental Group and

\mathbf{C} stands for Control Group

In the present study, the experimental design was followed. The investigator was able to conduct the experiment on two groups that were selected from the two different schools. The achievement of students in the English test of the experimental and control groups was measured through the pretest. The score thus obtained by the experimental and control groups in the pretest was used to make the groups equal. Experimentation was carried out with the

experimental group, and the control group studied through the traditional method. At the end of the experimentation, the achievement of students in English was measured as a posttest. A pretest and posttest of the creative thinking test was also taken to see how effective the developed strategy was in enhancing the creative thinking among the secondary school students through the teaching of English. The analysis and result of the data are used to see the effectiveness of the developed strategy on enhancing creative thinking among secondary school students.

3.3.0 VARIABLES IN THE STUDY

Following variables were involved in the present study.

3.3.1 Independent Variable

The independent variables are the conditions or characteristics that the experimenter manipulates or controls in his or her attempt to ascertain their relationship to the observed phenomena (Best & Kahn, 2006). In the present study, the developed strategy for enhancing creative thinking was considered as independent variable.

3.3.2 Dependent Variable

The dependent variables are the conditions or characteristics that appear, disappear or change as the experimenter introduces, removes or changes independent variables (Best & Kahn, 2006). It is also known as response variable. In the present study, creative thinking, achievement in English and reaction of students towards the developed strategy were considered as the dependent variables.

3.4.0 POPULATION OF THE STUDY

The population for the present study comprised all the students of standard IX studying in English-medium secondary schools affiliated with the Gujarat Secondary and Higher Secondary Education Board (GSHSEB) in Gujarat state during the years 2023–24.

3.5.0 SAMPLE OF THE STUDY

Considering the nature of the present study, a sample for the study was selected using convenient sampling. Two English-medium schools in Vadodara city were selected for the study as per the convenience to do the experiment. Both the selected schools were considered equal in standard as both the schools were affiliated with the same board and located within

the city area. The first school was used as the control group, and the second school, was used as the experimental group of Vadodara city. The students of one section of standard IX from each of the selected schools were selected as the sample for the study. Both the schools had strength of more than 45 students. These two groups were made equivalent on the basis of the pre-test score of the achievement test in English for the purpose of the experiment. Initially, there were 63 students in the experiment group and 55 students in the control group. After matching, the equivalent group consists of 30 students each for both experimental and control groups. Therefore, a total of 60 students constituted the sample for the present study. The summary of the sample distribution is shown in table 3.1.

Table 3.1: Sample Distribution for Experimental and Control Groups

Group	Number of Students
Experimental group	30
Control group	30
Total	60

3.6.0 PHASES OF THE STUDY

There were various stages, from development to analysis, that were conducted in the present study. Following is a brief description of the phases of the study.

3.6.1 Phase 1- Development of strategy and tools for data collection

The first phase of the current study was the developmental phase. This included preparation of an achievement test used as a pretest and posttest, development of the strategy to enhance the creative thinking skills, and preparation of a five-point Likert-type scale to get the reaction of the students towards the developed strategy. The development of the strategy is detailed under the caption 3.8.0. Detailed information regarding the development of the tools for the present study, i.e., the achievement test, creative thinking test, and reaction scale, is given under the captions 3.7.0.

3.6.2 Phase 2- Implementation of the strategy

During the implementation phase, the first step was administration of the achievement test for pretesting. The test was administered to both the control and experimental groups. The pretest scores were used to equate both groups. Before starting the experiment, the investigator administered the creative thinking skills test as a pretest to the experimental and control groups. It was followed by implementation of the strategy to teach English to the experimental group for six months in the academic year 2023-24. At the end of the experimentation, posttests in the form of creative thinking skills tests and achievement tests were administered to both groups to study the effectiveness of the developed strategy in terms of creative thinking and achievement, respectively. A reaction scale was administered to the experimental group to get the reaction of the students towards the teaching through the developed strategy to enhance creative thinking. Details of the implementation phase are given under the caption 3.11.0.

3.6.3 Phase 3- Data Analysis

The analysis phase included analyzing the scores obtained through the posttest. This was done to know the effectiveness of the strategy on enhancing the creative thinking skills in the English language among the experimental group. The reaction of students towards the strategy was also analyzed. The pretest and post test scores of the Experimental group of the achievement test in English was also analyzed to check the effectiveness of the developed strategy. Details of the statistical techniques used for the analysis are mentioned in Chapter 4.

3.7.0 TOOLS FOR DATA COLLECTION

Following tools were used by the investigator for the purpose of collection of data.

3.7.1 Achievement Test in English

To study the effectiveness of the developed strategy in terms of the achievement of the students in English, the investigator prepared and used the achievement test in English for both schools. The test was developed by the investigator, followed by the validation of experts. The test was for 50 marks. The investigator collected achievement test scores in English from experimental and control group schools after the completion of second term.

3.7.2.0 Creative Thinking Scale

Baqer Mehdi's Verbal and Non- Verbal Tests of Creativity: This test was developed by Dr. Baqer Mehdi (1989). It was published by the National Psychological Corporation, Agra. It consists of 4 verbal and 3 non-verbal sub tests. For the present study, only Verbal test of creativity was administered.

3.7.2.1 Verbal Test

1. Consequence test- The consequence test consists of three tasks in which the participants were given three hypothetical events and they were allowed to think of as many consequences as possible. E.g. a) What would happen if a man could fly like birds? b) What would happen if our school had wheels? c) What would happen if man does not have any need for food? The total time required for the test was twelve minutes. (Four minutes for each task).
2. Unusual uses test- The unusual test has three tasks wherein the participants were required to come up with as many novel, interesting and uncommon uses of the object as they can think of like a piece of stone, wooden stick, water etc. The total time allowed for the test was fifteen minutes. (Five minutes for each task).
3. New relationship test- The test has three tasks and requires the subject to think and write as many possible novel similarities with three pairs of words namely a) tree and house, b) chair and ladder, c) air and water. The time allowed for each pair of word is five minutes. So, the total time required for the test is fifteen minutes.
4. Product improvement test- This test has only one task and the subject is asked to think of adding innovative ways to a simple wooden toy to make it more interesting and engaging for children to play. The time allowed for the task is six minutes.

Thus, the total time required for the verbal test is forty eight minutes in addition to the time necessary for giving instruction, distributing the test booklets to children and collecting them back. Each of the items within the tests is then scored for fluency, flexibility and originality according to the instruction mentioned in the manual.

3.7.3.0 Scoring for the verbal test of creative thinking

Each item (A, B, C, D) in the verbal test has to be scored for fluency, flexibility and originality.

3.7.3.1 Scoring for Fluency:

Fluency refers to the number of relevant and unrepeated ideas which the subject gives as responses. Relevance is judged based on the appropriateness of the response to the task given in the test. An unrepeated idea is an idea which has been expressed only once under a given problem. For each response that is relevant and not repeated, one mark is added. The total marks received by the subject become the fluency score for the respective item.

For example- One of the tasks given to the subject in the test is to think of all possible consequences on what would happen if a man could fly like birds? The responses given are- no use of bus, no use of airplane and no use of parachute. Since the number of ideas are three the subjects will be given three marks for that item.

The scoring is done similarly for all items and the total marks become the fluency score for the verbal test of creative thinking.

3.7.3.2 Scoring for Flexibility:

Flexibility is represented by a person's ability to produce ideas which differ in approach. All ideas that belong to one category of approach will be given one mark. Thus, if three ideas are produced and all belong to only one approach, then the score of flexibility will be one, but if all three are based on three different approaches then the flexibility score will be three.

For example- One of the tasks given to the subject in the test is to think of all possible consequences on what would happen if man could fly like birds? The responses given are- no use of bus, no use of airplane and no use of parachute. However, while scoring, though the number of ideas is three, only a score of one mark will be given as they just describe one approach i.e. the effect on transport and travel.

The scoring of flexibility is done by referring the categories of responses mentioned in the scoring guide of the manual.

3.7.3.3 Scoring for Originality:

Scoring is done on the basis of uncommonness of the responses. The scoring is done by referring to the scoring guide given in the manual and also considering the responses of the subjects in the respective group. If the response has been given by 0.1% to 0.99% of the subject, then the originality score will be five. If a response has been given by 1 to 1.99% of the subject, then the originality score will be four. If a response has been given by 2 to 2.99% of the subject, then the originality score will be three. If a response has been given by 3 to

3.99% of the subject, then the originality score will be two. If a response has been given by 4 to 4.99% of the subject, then the originality score will be one. If a response has been given by 5% and more of the subject, then the originality score will be zero. Thus a score of five indicates high originality and a score of zero indicates low originality.

3.7.4 Reaction Scale:

To get the reaction of the students towards the integrated strategy for creative thinking the investigator prepared a Likert type five point reaction scale to know the reaction of students towards the strategy to enhance creative thinking. The scale covers all the components of developed strategy for creative thinking. There were a total of 20 statements in the scale related to different aspect of their experiences during the execution of strategies and teaching learning of English. Developed reaction scale had five ratings like strongly agree, agree, average, disagree and strongly disagree. The weightage for ratings of the scale was 5, 4, 3, 2, 1 respectively for the SA, A, UD, D, SD. Students were asked to rate each statement on a five-point rating scale, giving their honest responses. Experts in the field evaluated the scale to confirm its validity, and changes were made in response to their comments. At the end of the investigation, the experimental group was given the completed and approved reaction scale. After six months of instruction utilizing the integrated strategy, the students' responses were gathered in order to evaluate the efficacy of the method. The developed reaction scale is attached in appendix VIII.

3.8.0 STRATEGY TO ENHANCE CREATIVE THINKING

According to the American dictionary, “A strategy is a long-range plan for achieving something or reaching a goal.” Similarly, the dictionary defined “strategy as any plan you make to achieve a goal.” In the present study, to achieve the defined objectives, a strategy was developed keeping in mind the creative thinking skill. Therefore, a teaching technique that can direct the teacher to separate the thinking process from a creative thinking process was needed. With this aim, a strategy for creative thinking was developed that provides the opportunity to think specifically at different stages of learning. The integrated strategy that was developed was used to teach English in an integrated manner where students learn creative thinking skills through English subject content.

An operational plan known as a developed integrated strategy gives a teacher detailed instruction on how to apply it when instructing a subject. It makes it easier for teachers to

create learning scenarios that inspire pupils to think outside the box while coming up with original solutions. In addition, it facilitates the development of an inspiring learning atmosphere in the classroom where students feel free to freely share their experiences relating to the subject matter. Students are able to express their thoughts freely and imaginatively while using a well-developed integrated teaching technique, free from peer and instructor criticism. Since the process of creative thought occurs in a vacuum, it requires a certain amount of prior information and comprehension. Since a solid foundation of knowledge is necessary, the integrated strategy gives pupils the chance to acquire the subject matter through child-centered techniques that foster creativity.

3.9.0 DEVELOPMENT OF STRATEGY TO FOSTER CREATIVE THINKING

The key component of developing a strategy to enhance creative thinking among students is to create an interesting and exciting learning environment. Providing students with open-ended challenges and encouraging inquiry-based learning empowers them to try new things, take chances, and come up with original answers. Divergent thinking is facilitated to examine concepts from multiple angles by using strategies like brainstorming, role play, creative writing, SCAMPER, questioning, and concept mapping. It is necessary to incorporate activities that encourage imaginative inquiry along with critical thinking when creating a plan to improve creative thinking in English language instruction. Students learn to think creatively when given assignments involving writing, such as conversations, poetry, and narrative creation. Role playing and dramatization help students to investigate various viewpoints and find novel methods to communicate concepts. Most importantly, the inquisitiveness in students to try new things and think creatively is crucial in helping them develop their innovative thinking skills.

The investigator developed an instructional strategy that was used in the teaching and learning process of English, focusing on the components of creative thinking. An integrated approach was adopted to ensure its feasibility. Each of the below-listed strategies is intended to stimulate creative thinking skills.

a) Brainstorming- Brainstorming is a creative method for generating ideas individually or in groups. It begins with presenting a problem to spark creativity, followed by a timed session to produce ideas. Osborn's four rules emphasize quantity over quality, withholding judgment, encouraging unconventional ideas, and building on others' suggestions for idea refinement. Giving kids an open-ended problem and encouraging them to come up with as many ideas as

they can is one way to facilitate brainstorming. Establish a non-judgmental atmosphere, encourage non-traditional thinking, and let students build on one another's ideas to encourage cooperation and creative problem-solving.

b) SCAMPER: This strategy enhances creative thinking by prompting students to explore new ideas through seven techniques: Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, and Rearrange. These prompts encourage students to rethink and innovate by modifying existing concepts, leading to unique solutions and fostering problem-solving skills. It works by guiding individual through a series of creative prompts. This structured approach stimulates creative thinking.

c) Concept Map: Concept mapping is a visual aid that uses diagrams to link and arrange concepts around a main topic. By promoting connection discovery, it improves comprehension of difficult subjects, helps students recognize connections between concepts, and stimulates creative thought. It encourages deeper learning, critical thinking, and problem-solving abilities. It begins by outlining the main concept or issue. Students should be encouraged to generate ideas for related topics and arrange them graphically around the main theme, using arrows or lines to connect thoughts. They are encouraged to investigate unusual or ethereal links between ideas. With this students learn to think creatively, connect ideas, and work together to create original solutions.

d) Creative Writing: Creative writing stimulates to come up with unique ideas, plots and characters. This encourages children to think innovatively and beyond the box which develop their originality- a crucial aspect of creative thinking. Students explore various viewpoints, places and emotions through creative projects. This activates their creative faculties, pushing them to imagine alternative to the actual world, which improves their capacity for ideation and production. Writing entails planning ideas, arranging storylines and crafting logical narratives.

e) Questioning: Students' thinking is sparked by probing questions, which fosters creativity by examining ideas from several perspectives. Good questions probe for more information, examine intricacies, and question presumptions. "How," "why," or "what if" are common starting points for inquiries that delve into underlying causes or possible results. Possibility inquiries stimulate imagination, pique curiosity, and generate fresh concepts. Careful questioning encourages dialogue, argumentation, and teamwork while dispelling obstacles

and generating a range of viewpoints—all of which are necessary for original thought and creative problem-solving.

f) Role play: Role play enables students to think beyond their own experiences. They acquire the ability to view problems from a variety of angles by taking on several roles. By playing different characters, students are able to think creatively with empathy which opens up new ways of knowing and thinking. As a result, students are inspired to be creative and imaginative, generating scenarios, conversations and exchange of ideas. This fosters the development of original problem solving techniques that are useful in everyday circumstances. Learning becomes dynamic and involved experience when role play is incorporated. By giving students the opportunity to try out new ideas, collaborate with peers, and express themselves in imaginative ways, they learn to think more creatively and solve problems more effectively.

An integrated strategy was developed by the integration of the mentioned strategies at the different stages of the creative thinking process. It was then reviewed and refined through discussion with experts in the field ensuring content validity and effectiveness in fostering creative thinking skills within the devised approach.

3.10.0 PREPARATION OF LESSON PLAN

The study adhered to the GSHSEB syllabus, hence the books recommended by the GSHSEB were used to identify the chapters. Both schools used the NCERT textbooks which is Beehive and Moments. On the basis of same chapters that were taught in both the experiment and control group schools during second semester which began in October, 2023. The investigator selected 14 units as per the time constraints and convenience. The lesson plan was created using Herbatian steps considering the discussed strategy. The sample lesson plan is attached in appendix X.

3.11.0 IMPLEMENTATION OF THE STRATEGY

The goal of the current study was to develop an integrated teaching strategy for standard IX students as well as instruments to assess how well the strategy was stimulating secondary school students' creative thinking. After receiving approval from the appropriate authorities, the investigator chose two GSHSEB schools from Vadodara city to meet the research goals. For the second academic semester 2023-2024, the school in Vadodara city was chosen as the control group, where students were taught by their regular subject teacher and another school

was chosen as the experimental school for teaching English to IX standard students through an integrated technique. In September 2023, the pre-test was given to both schools by the investigator to make the groups equivalent. After making the groups equal, the investigator started teaching English with the integrated strategy in standard IX of the experimental group. Lesson plans were created using the developed strategy and the syntax of creative thinking for every class in order to instruct the experimental group. Appendix X contains a sample lesson plan. In addition to teaching IX standard students in the experimental group for the second semester as a subject teacher, the investigator also ensured that their notebooks were corrected, that they completed their coursework for their regular school exams, and that their academic progress was being made while encouraging creative thinking. The investigator led regular classes, three to five sessions a week, covering topics chosen to foster creative thinking as the main focus of instruction. The implemented integrated technique for teaching also required some facilities from the school, like cooperation by the school teacher on conducting classes smoothly and a small adjustment to the seating arrangement for other group activities and to facilitate productive group discussions. Students were asked to keep their usual notepad for class. The investigator used the creative thinking scale as a posttest on both student groups after the syllabus was finished in order to evaluate the efficacy of an integrated strategy for improving both groups' creative thinking and English accomplishment tests. A reaction scale was also given to the experimental group, who were instructed in using the created method to obtain the students' opinion of it. Some images that show how these creative thinking techniques were put into practice are given in the Appendix IX.

Table 3.2: Strategy Used in Chapters while Teaching of English to Enhance Creative Thinking

Chapter	Strategy	Creative Situation
My Childhood - A.P. J. Abdul Kalam	Brainstorming SCAMPER	How can we prioritize our needs in a difficult situation? Imagine what would happen if such social discrimination happen with you? What are the classifications and

	Concept Mapping	attributes given to school teachers?
No Men Are Foreign - James Kirkup	Creative writing Questioning	Imagine you are a soldier on the battlefield. An enemy confronts you directly. Write a dialogue between the two of you, that emphasizes your humanity.(3 set) What practical steps can people take in their daily lives to break cycles of division and prejudice?
Reach For The Top Part-1 Santosh Yadav	Brainstorming Scamper Concept Mapping	How would you use her experiences as lessons in persistence and teamwork? Imagine you are Santosh Yadav, what goes through your mind when you make the decision to help others even in life threatening situations? What lessons from Santosh's life would you include in your life to encourage yourself to never give up?
Reach For The Top Part-2 Maria Sharapova	Brainstorming SCAMPER Concept Mapping	What strategies would you use to bounce back and maintain motivation? How would you apply the skills you've developed in one area to succeed in another? What qualities do you think define a champion's mindset?

	Concept Mapping	<p>and make their decisions.</p> <p>How would your own values and experiences shape the choices you make in their shoes?</p>
Reported Speech	Creative Role Play	Imagine you have an opportunity to interview famous person. Role of the time traveling journalist and other becomes the character from history or future.
Active Passive Voice	Creative Role Play	Create a crime investigation team. One student plays the role of a detective while the other student is a witness to a mysterious event.
Question Tags	Questioning	Students are presented with a series of answers and they have to create questions with appropriate tags.
Notice Writing	<p>Creative Writing</p> <p>Questioning</p>	<p>The school will be closed due to a sudden, mysterious reason. Write a notice to inform students and staff, but also add a touch of humor or suspense. How can you creatively explain the unexpected closure?</p> <p>Imagine you need to grab the attention of students who often ignore notices. How would you write a creative and engaging headline for a notice about an upcoming event?</p>
Story Writing	Creative Writing	Write a story that begins with the ending and works backward. How does the reader gradually piece

groups and to know the reaction of the developed strategies, reaction scale was also administered to the experimental group.

3.12.1 Administration of Pretest

The academic session 2023-24 began from April 2023, and the second semester started from October 2023. The investigator administered the pretest of Achievement test in English and Creative thinking skills test to both experimental and control group. Administration of the pretest took place in the English subject classes that were scheduled in the timetable. The purpose of the administration of pretest was explained and informed to the students prior to its administration.

3.12.2 Administration of Posttest

After the implementation of the integrated strategy in the teaching learning process, the investigator conducted the posttest on both experimental and control group during the month of March to collect the data. Creative Thinking skills test was administered to both the groups: Experimental and Control. Achievement test in English was also conducted as posttest to both the groups: Experimental and Control to gauge their academic performance in English subject.

3.12.3 Administration of the Reaction Scale

To get the reaction of the students towards the integrated strategy for creative thinking, the investigator prepared a five-point Likert type reaction scale to know the reaction of students towards the strategy to enhance creative thinking. The scale covers all the components of a developed strategy for creative thinking. There were a total of 20 statements in the scale related to different aspects of their experiences during the execution of strategies and teaching and learning English. The developed reaction scale had five ratings like strongly agree, agree, average, disagree, and strongly disagree. The weights for ratings of the scale were 5, 4, 3, 2, and 1, respectively, for the SA, A, UD, D, and SD. Students were asked to put their reaction to each statement honestly against these five-point ratings. A developed reaction scale was given to experts in the field to determine the validity of the scale, and based on their suggestions, it was improved. The developed and validated reaction scale was administered to the experimental group at the last part of the experimentation of the study. The effectiveness of the integrated strategy in terms of the reactions of students who were taught through the strategy for six months was collected.

3.13.0 STATISTICAL ANALYSIS

The data gathered throughout the intervention period was examined and interpreted in order to determine how effective the developed strategy was. Based on the post-test results of the control group and the experiment group, statistical techniques such mean, statistical deviation, standard error of mean, and U-test were computed. Since the study was quasi-experimental in nature, the non-parametric Mann-Whitney U-test—the t-test's counterpart—was employed. The frequency, percentage, and intensity index were computed in order to examine the response scale.