CHAPTER – 3

REVIEW OF RELATED LITERATURE

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1.1 Introduction:

The review of theories and past literatures are very important to the investigator. It provides the investigator to understand what is necessary and to see problems, to prepare the work design and acquire ideas to select the proper tools and samples. It also helps to solve the problem systematically and provide useful guidelines in his/her field and adapt technique for research.

The review of work done implies locating, reading and summarizing Objectives, methods and findings of the past researches. The review of related literature is nothing but a wild look into the past research work done in the specified field. It provides information related to the type of study and type of design that may be eventually used in conducting research. Research works done in the past serve as solid foundation on which any new investigation firmly rests.

Walter (1963) emphasizes the meaning of related literature as: “The literature in any field forms the foundations upon which all future work will be built.” The author further observes that if one fails to build this foundation of knowledge provided by the review of the literature, his work is likely to be shallow and naive and will often duplicate work that has already been done better by someone else.

Good, Bar and Scats (1954) points out:

“The keys to the vast storehouse of published literature may open doorstop sources of significant problems and explanatory hypotheses and provide helpful orientations for definitions and comparative data for interpretation of results. In order to be truly creative and original, one must read extensively and critically as a stimulus to think.”

3.2 Purpose Of The Review:

Every investigator must know what sources are available in the field of Research and how many of them are worthy to be used. As in other field, in the field of education also, the research worker needs up-to-date information regarding the problem i.e. what has been thought and done in the particular area.
Good, Bar and Scats analyze the purpose of research review as follows:

**a.** To show whether the evidence already available solves the probed quietly without further investigation and thus to avoid the risk of duplication.

**b.** To provide idea, theories, explanations or hypotheses valuable in formulating the problem.

**c.** To suggest methods of research appropriate to the problem.

**d.** To locate data useful in the interpretation of result.

**e.** To contribute the general scholarship of the investigator.

When the investigator makes a careful review of the related studies, he becomes aware of the important and unimportant variables in the concerned area of research. A careful review also helps the investigator in selecting the variables lying within the scope of his interest, in defining and operational sing variables and identifying variables which are conceptually and practically important. Thus, a review of the related studies, on the whole, prepares the investigator to formulate a research problem in which conceptually and practically important variables are selected.

### 3.3 Importance Of The Review:

A review of the related studies helps the investigator in avoiding any duplication of work done earlier. A careful review always aims at interpreting prior studies and indicating their usefulness for the study to be undertaken. Thus prior studies serve as the foundation for the present study. In some cases duplication or replication of prior studies become essential. This is especially true when the investigator wants to test the validity of the earlier studies. In such a situation, too, a careful review helps the investigator in getting acquainted with the number and nature of the studies related to the study whose validity is being assessed at present.

A careful review of the related studies enables the investigator to collect and synthesize prior studies related to the present study. This helps the investigator
in building a better perspective for future research. A synthesized collection of prior studies also helps the investigator to identify the significant overlaps and gaps among the prior works.

A review enables the investigator in discovering important variables relevant to the area of the present study. When significant variables are discovered, the relationship among them can be identified. Subsequently, the identified relationship is incorporated into different hypotheses. Thus, for conducting a scientific study, the relationship between the different variables must be explored by reviewing the related studies so that a good context maybe built up for subsequent investigation.

A careful consideration of ‘recommendations for further research’ in various research studies guides the investigator regarding the suitability of the problem and assists in delimiting his research problem. Therefore, the investigator has tried to review the literature of the past studies related to experiential learning and learning style to benefit him in the above mentioned ways.

3.4 Review of Related Researches on Experiential Learning & Learning Style:

Investigator does not found any research done at doctorate level on experiential learning in India. Hence, investigator has reviewed researches done in foreign countries in this area.

Study: 1

- **Name:** Lynn D. Grinnell
- **Title:** A qualitative exploration of reflective thinking in experiential learning debriefings
- **University:** University of South Florida
- **Year:** January 2003
- **Objectives:**
This study will explore the patterns that occur in learning processes during the three reflective stages of the experiential learning cycle using written debriefings of experiential activities.

**Research Questions:**

This research study asks one basic question: What cognitive and emotional processes occur during the debriefing stage of an experiential learning cycle?

**Research Method:**

A multiple case study approach examined written debriefings following experiential activities. The study used multiple theories, raters, and methods to strengthen internal validity.

**Tools for data collection:**

Following tools were used for data collection.

1) In-class Experiential Activities
2) Debriefings
3) Data Review
4) Coding

**Data Analysis:**

Using the grounded theory analysis, the researcher developed process maps and themes that helped explain the connections found in the data. The internal validity of the grounded theory analysis was confirmed by asking the other coders and some of the participants to evaluate whether the coder’s process maps and themes seemed to reflect the students’ experiences accurately. A thick description of the themes, using direct quotes from the written debriefings, was developed from the patterns and process maps to illustrate the cognitive and emotional processes that appeared to be taking place in debriefings.

In the content analysis, the coders’ scores on the dependent variables were averaged and totaled for each debriefing. The scores were graphed in seven growth gradients graphs showing the levels of the seven variables at each stage of
the debriefing over the three debriefings. Patterns found in the scores were discussed among the coders and summarized.

**Research Findings:**

Findings of the research were

In the descriptions of (a) connections and (b) mental rehearsal, learning appeared to increase through engagement in deliberate reflection after a concrete experience. Kolb’s (1984) two learning dimensions – perception and process – could be observed being transformed into knowledge through reflection or action, despite the fact that students did not always follow the prescribed briefing format order.

Students made more complex connections and abstractions in the second half of debriefings than in the first half or in classroom oral debriefings as they developed personal theories and engaged in mental rehearsal of contemplated action. They brought in textbook content to the greatest extent in the abstract conceptualization stage of debriefings, when they were making connections between their actions in the activity and prior knowledge. The extent, to which content was discussed, however, depended on the type of activity. One debriefing that explicitly instructed students to apply textbook material directly to a problem generated more discussion on textbook content throughout the debriefings than did other activities.

**Study: 2**

- **Name:** Marian Padure
- **Title:** Characteristics of learning styles in people with visual impairments in using assistive technologies
- **University:** Babes-Belaya university Cluj-Napoca (Ph.D.)
- **Year:** 2011
**Objectives:**

Following objectives were set for research,

1) The assessment of learning strategies and style of pupils and students with and without visual impairments, by investigating the differences between them.

2) Identification of the level of assistive technologies utilization in educational and vocational guidance activities.

3) Identification of relationships between the constructs underlying models of learning styles and use of assistive technologies in the educational-instructive process.

4) Identification of the psychosocial impact of the assistive technology from the pupils and students with visual impairments perspective.

**Hypotheses:**

Following hypotheses were set for research,

1) There will be significant global difference between the learning styles and strategies of the pupils / students with visual impairments comparing with pupils / students without disabilities.

2) There will be significant differences between the dimensions of learning styles and strategies (reproduction oriented, understanding oriented, knowledge-oriented and non-oriented) at pupils / students according to the presence versus absence of the visual impairment.

3) There will be significant differences regarding the analysis (visual, auditory, reading / writing, kinesthetic) of information between pupils / students with visual impairments, compared with pupils / students without disabilities.

4) Assistive technologies the structuring and shaping of the learning styles and strategies of the pupils and students with visual impairments.

**Research Method:**

A (group) X 2 (age) X 2 (gender) quasi-experimental design was used in the study. The group of participants with visual impairments consisted of (a) pupils from special school and (b) students registered in public or private
universities from Romania. The group of participants without visual impairments was composed by (a) pupils from the pedagogical High school “Stefan Odobleja” from Drobeta Turnu Severin and (b) visually impaired students registered in public or private universities in Romania.

**Tools for data collection:**

Following tools were used for data collection.

1) Vermont Inventory of learning styles
2) Felder and Solomon index of learning styles
3) Fleming and mills learning styles inventory
4) Rating scale of access technologies psychosocial impact
5) The questionnaire for assessing the preferences and strategies used in the learning process in the assistive technologies use context.

**Data Analysis:**

Using the analysis of the Alpha and Guttmann Slpit-Half coefficient values for the instruments used within the framework of this research, for the entire group and for the group of participants with visual impairments.

**Research Findings:**

Findings of the research were

In the descriptions of (a) connections and (b) mental rehearsal, learning appeared to increase through engagement in deliberate reflection after a concrete experience. Kolb’s (1984) two learning dimensions – perception and process – could be observed being transformed into knowledge through reflection or action, despite the fact that students did not always follow the prescribed briefing format order.

Students made more complex connections and abstractions in the second half of debriefings than in the first half or in classroom oral debriefings as they developed personal theories and engaged in mental rehearsal of contemplated action. They brought in textbook content to the greatest extent in the abstract conceptualization stage of debriefings, when they were making connections
between their actions in the activity and prior knowledge. The extent, to which content was discussed, however, depended on the type of activity. One debriefing that explicitly instructed students to apply textbook material directly to a problem generated more discussion on textbook content throughout the debriefings than did other activities.

Study: 3

- **Name:** Rosalind D. Kopsovich
- **Title:** A Study of Correlations between Learning Styles of Students and their Mathematics Scores on the Texas Assessment of Academic Skill Test
- **University:** University of North Texas (Ph.D.)
- **Year:** August 2001
- **Objectives:**
  
  Following objectives were set for research,

  1) To provide a correlation of the similarities and differences in 5th grade students’ learning styles and their achievement scores in mathematics.

  2) To provide information to persons concerned with how 5th grade students learn and whether learning styles affect their achievement, especially in mathematics.

- **Research Questions:**
  
  Following Research Questions were set for research,

  1) Is there a correlation between 5th grade students’ learning styles and their standardized math test scores?

  2) Is there a positive correlation between specific sub groups of 5th grade students’ learning styles and their math standardized test scores?

  3) Is there a positive correlation between male and female 5 grade students’ learning styles and their math standardized test scores?
Hypothesis:

Following hypotheses were set for research,

1) There will be no significant differences in the math TAAS test scores of 5th grade students with different learning styles as determined by Dunn, Dunn and Price.

2) There will be no significant differences in the math TAAS test scores of 5th grade Caucasian students with different learning styles.

3) There will be no significant differences in the math TAAS test scores of 5th grade Hispanic students with different learning styles.

4) There will be no significant differences in the math TAAS test scores of 5th grade Afro-American students with different learning styles.

5) There will be no significant difference in the math TAAS test scores of 5th grade male and female students with different learning styles. The variables correlated are continuous scores. The standardized math scores of the TAAS test and the learning style preferences of all fifth grade students, Caucasian fifth grade students, Hispanic fifth grade students, Afro-American fifth grade students.

Research Method:

Two Groups, experimental design was used in the study.

Tools for data collection:

The Learning Styles Inventory by Dunn, Dunn and Price was administered to 500 fifth grade students. The students were randomly divided into three equal groups. The test administration was over a three-day period and each group was given the test at the same time of the day by the same person. The average time for the completion of the LSI was approximately 30 minutes.

Data Analysis:

The Pearson Product Moment Correlation coefficient chosen for this study allowed the researcher to examine a relationship between learning style preferences of 5th grade students and their TAAS test scores in mathematics. A
Point serial correlation (rpbis) was also utilized to examine relationships between male and female fifth grade students’ learning style preferences and their TAAS test scores in mathematics. This analysis was also used to examine ethnicity groups’ learning style preferences and their TAAS test scores in mathematics.

❖ Research Findings:

Findings of the research were

1) The correlation of all fifth grade students' learning styles and their math achievement as measured by their test scores on the Texas Assessment of Academic Skills test did produce a significant relationship at the .05 level (p < .05) and at the .01 level. This relationship existed between the learning preference of all students as displayed in their high level of “persistence to complete a difficult learning task or assignment” and their math achievement scores.

2) A relationship existed at the .05 level of significance between the learning preferences of Caucasian students' high level of “responsibility to complete a difficult learning task or assignment” and their math achievement scores. There was also a relationship that existed at the .01 and .05 level of significance between the Caucasian students' learning preference in the area of a high level of “persistence to complete a difficult learning task or assignment” and their math achievement scores.

3) A relationship existed at the .05 and the .01 level of significance between the Afro-American students' preference to learn “kinesthetically” and their math achievement scores.

4) There was a correlation at the .05 level of significance between the Hispanic students' learning preference or desire to do well in school motivated by the need to “please the teacher” and their math achievement scores. A relationship existed at the .05 level and the .01 level of significance between Hispanic students' learning preference for a “warm temperature of their environment” and their math achievement scores.
Study: 4

- **Name:** Thomas Hainey
- **Title:**
  
  Using Games-Based Learning to Teach Requirements Collection and Analysis at Tertiary Education Level
- **University:** University of the West of Scotland (Ph.D.)
- **Year:** May 2010
- **Objectives:**

  The primary objective of this research is to use a GBL approach to attempt to address some of the shortcomings of some of the traditional teaching approaches applied to teach requirements collection and analysis in software engineering.

  Since the purpose of this project is to use a GBL approach to address some of the shortcomings of traditional approaches and to increase motivational interest with regards to software engineering concepts, then a review of traditional approaches will be performed. This review will assist in identifying key concepts that should be incorporated into the game.

- **Research Questions :**

  The research questions that can be generated were:

  1) What views of computer games and computer games for learning do HE students have?

  2) What empirical evidence associated with GBL and software engineering concepts currently exists in the literature? What evaluation frameworks exist and how has GBL been evaluated?

  3) Can GBL be a suitable approach to teach requirements collection and analysis at a supplementary level in tertiary education?
 **Research Method:**

The research methodologies selected for this project will be: archival research for the literature reviews, and survey, questionnaires and descriptive statistical techniques for the survey studies. The interventions studies will use a pre-test - post-test, experimental/control group prototypical design.

 **Tools for data collection:**

Following tools were used for data collection.

1) Questionnaire on Motivations
2) Requirements Collection and Analysis Game
3) Role-Play Case Study Instructions
4) Role-Play Case Study Script
5) Game Evaluation Questionnaire
6) Role-Play Questionnaire

 **Data Analysis:**

The analysis techniques will be descriptive statistical analysis and inferential statistical analysis including: Wilcoxon sign tests for related samples, Mann-Whitney U tests for independent samples, and a Kruskal-Wallis test.

 **Research Findings:**

Findings of the research were,

Overall the studies performed in this programme have shown that GBL can be a suitable approach to teach requirements collection and analysis at a supplementary level in tertiary education. While the control and experimental groups all experienced a significant increase in knowledge at both FE and HE level, the research performed indicated that a GBL approach to teach requirements collection and analysis may be more suitable to HE level than FE level. In terms of knowledge acquisition with regards to the original six knowledge questions, the HE experimental group learners had a higher level of knowledge in the pre-test and a higher level of knowledge on the post-test in comparison with the FE group.
experimental group learners. This suggests that different levels of initial knowledge should be taken into account when considering a GBL approach for different educational levels. When comparing the HE and FE students with the additional questions there was no significant difference between knowledge levels on the pre-test, however HE students had a significantly higher level of knowledge in the post-test again indicating that the GBL approach is more effective at HE level than FE level. There was no significant difference in the ratings of the aspects of the game between the groups indicating that the aspects remained consistent and did not adversely affect the results.

The results indicate that the game did not meet the expectations of FE learners to as much of a degree as the HE learners. The game met FE expectations with regards to 3 aspects; however it met HE expectations with regards to 6 aspects. Interestingly the role-play activity met the expectations of FE students but did not meet any of the expectations of any of the categories in HE. This is possibly because role-play is a better known technique at FE level and GBL is a newer more novel technique. The differences in expectations could not be explained by a difference of age or any significant difference in expectation levels in the pre-test between the two groups.

In terms of perceptions HE students were more accepting of the game. They were more willing to play the game over time, play the game as part of a computing course and found the game more engaging. HE students also expressed a greater desire to play the game again and felt that the game could be used in its anticipated domain in the future. HE students were less distracted while playing the game and believed that future development of the game could potentially help people of their demographic more.

Both groups believed that the game fitted well into its intended context, that the advice in the game was acceptable and that the game was complex. They also believed that the realism of the game was adequate and that generally, the game
did not require increased or decreased realism to improve it and that future development of the game could potentially help them.

In conclusion the studies showed that a GBL approach can be used to teach software engineering concepts at a supplementary level in tertiary education. The approach seems to be more suited to HE learners in terms of knowledge acquisition, aspects and perceptions as opposed to FE learners. Despite the fact that the game did not meet the expectations of FE learners and was perceived slightly more negatively, the game proved to be just as effective as the role-play in providing a supplementary learning experience at FE level. One possible explanation for this difference in perceptions and expectations is differing levels of maturity between the groups of learners.

A highly important issue to discuss is that this chapter has provided a preliminary evaluation of a game to offer insight into its potential usability and learning effectiveness at tertiary education level. The evaluation has shown that the game can be used, however to be used effectively in a course or module would require different, more substantial qualitative study and experience.

**Study: 5**

- **Name:** Chehrazade Aboukinane
- **Title:** A Qualitative Study of Creative thinking using experiential learning in an Agricultural and Life Science Course
- **University:** Texas A&M University (Ph.D.)
- **Year:** December 2007
- **Objectives:**
  
  The purpose of this study was to explore whether creativity can be nurtured in an experiential learning environment at the college level.

- **Research Questions:**

  Following two research questions:
1) How well do construct-based creativity models for determining creative behavior apply to a college level experiential learning environment?

2) How well do process-based creativity models for determining creative behavior apply to a college level experiential learning environment?

❖ Research Method:

Qualitative approaches were used while observing students and analyzing their work in four distinct settings, which allowed gathering information from four different sources. The type of research for this study was primarily qualitative in the form of narrative analysis of data, but it also includes quantitative aspects.

❖ Tools for data collection:

Following tools were used for data collection.

1) Consent Form
2) Moderator’s Guide
3) Script of questions used in the focus group interviews
4) Questionnaire
5) Raw data from questionnaire

❖ Data Analysis:

The Data analysis of all four sources (field notes, focus group interview, questionnaire and portfolios) was based on Miles and Huberman’s (1994) flow analysis model. The data analyses consisted of three concurrent flows of activity: data reduction, data display, and conclusion drawing and verification (Miles & Huberman, 1994).

❖ Research Findings:

Findings of the research were for the all research questions,

1) The field observation findings confirmed that this particular learning experiential and team-based learning environment allowed fostering convergent and divergent thinking, humor, openness, and confidence among college students.
2) The focus group interview findings confirmed the emergence of the creativity constructs observed during the in-class activities and was used as further evidence of the field observations to strengthen credibility of the data obtained.

3) Results of the student questionnaire further supported the observance and descriptions of divergent and convergent thinking, confidence, and openness obtained in the field observation and focus group interview analyses. Two new constructs (ability to extend boundaries and reflection) were also evident from the student answers to the questionnaire.

4) Results of the analysis of student portfolios demonstrated that all students truly sensed and recognized the problems posed. This was a good indicator of problem awareness.

5) The study indicates that this college level course allowed the use of nine out of eighteen dimensions of construct-based creativity models. Three out of the nine creativity dimensions were developed among students during the creative problem solving process and include: confidence, reflection, and openness.

Study: 6

❖ **Name:** Paul Difrancesco

❖ **Title:**

“The Role of Situated Learning In Experiential Education: An Ethnographic Study of the knowledge-Construction process by pharmacy students during their clinical rotation”

❖ **University:** University of Massachusetts Boston

❖ **Year:** June 2011

❖ **Objectives:**

This study seeks to explore the learning process that leads to the social construction of new knowledge or "meaning-making" that emerges in the experiences of pharmacy students engaged in clinical experiential learning.
❖ **Research Questions:**

The following questions have been developed for the research:

- **Main question.**

  What factors in a social practice support the knowledge-construction process of pharmacy students during their experiential rotations?

- **Supporting questions.**

  1. How do students contribute to their own learning during their rotations?
  2. Which teaching strategies within the practice facilitate student learning?
  3. What role do context and content play in experiential learning?

❖ **Research Method:**

A qualitative methodology was used in this study. Finally, it can be said that qualitative research is reliant on emergent design. The direction of the research changed as the study evolved. The process was deductive since the data collection and analysis were guided by the factors of situated learning theory.

❖ **Tools for data collection:**

The structure for interviewing and observation that I used in this study was created to assist me to understand what people knew, what they were doing, and what they were using to create products and services. The interview protocol that I employed sought information about the following topics: (a) a student's biography and educational history, (b) the specifics of a student's activities, (c) the views and understandings of the student, (d) critical incidents—what happened, why, and what did it mean (Spradley, 1979), and (e) clarification of or curiosity about my observations.

❖ **Data Analysis:**

In the field of qualitative research three perspectives exist about how to determine the quality of the research. On one side, a number of researchers believe that qualitative data should be judged by many of the same means as quantitative research. On the other end, there are those who feel that there should be no
standard requirement. The rest of the field is located somewhere between those two views (Rolfe, 2006). In this study, I have taken the last view and have used a number of predetermined criteria to ensure the quality of my data during the entire cycle of my study.

**Research Findings:**

Four students discussed the various aspects of their experiential learning in their own words. We learned about their family background, educational history, and the factors that helped shape their decisions about which higher education program to attend. They also discussed their learning styles and experiences as they moved through the didactic courses and laboratory work prior to their yearlong experiential rotation assignments.

The students had diverse backgrounds and came to choose pharmacy as a career for different reasons. During their coursework they approached learning differently, employing unique techniques to help facilitate their learning. Each student had career goals that were, in each case, still not totally defined. However, during the experiential phase, after I interviewed these students and observed them over two experiential rotations, it became apparent to me that certain common factors affected their ability to learn.

**Study: 7**

- **Name:** Abhipsaben G. Yagnik
- **Title:** "Effect of Synectics Method of Teaching on Development of Language Creativity in English"
- **University:** University of Sardar Patel (Ph.D.)
- **Year:** January 2010
- **Objectives:**

The following were the objectives of the present study:

1) To study the effects of Synectics method on Creative Thinking i.e.
a) Fluency  
b) Flexibility  
c) Originality  
d) Creative Thinking (Total)

2) To study the effects of Synectics method on Fluency and Originality in Plot Building.

3) To study the effects of Synectics method on Fluency and Originality in Dialogue Writing.

4) To study the effects of Synectics method on Fluency and Originality in Poetic Diction

5) To study the effects of Synectics method on Fluency, Flexibility, Originality and Elaboration in Descriptive Style.

6) To study the effects of Synectics method on Fluency, Flexibility and Originality in Vocabulary Style.

7) To study the effects of Synectics method on Total Fluency of Language Creativity Test in English.

8) To study the effects of Synectics method on Total Flexibility of Language Creativity Test in English.

9) To study the effects of Synectics method on Total Originality of Language Creativity Test in English.

10) To study the effects of Synectics method on Total Elaboration of Language Creativity Test in English.

❖ Hypotheses of the study:

The following hypotheses are formulated in pursuance of the objectives of the study:

a) Comparison of Post test scores of Language Creativity Test in English of experiment group and Control Group of Experiment I and Experiment II

1) There will be no significant difference between the mean scores of Posttest of Fluency in Plot Building of Experiment group and control group.
2) There will be no significant difference between the mean scores of Posttest of Originality in Plot Building of Experiment group and control group.
3) There will be no significant difference between the mean scores of Posttest of Fluency in Dialogue Writing of Experiment group and control group.
4) There will be no significant difference between the mean scores of Posttest of Originality in Dialogue Writing of Experiment group and control group.
5) There will be no significant difference between the mean scores of Posttest of Fluency in Poetic Diction of Experiment group and control group.
6) There will be no significant difference between the mean scores of Posttest of Originality in Poetic Diction of Experiment group and control group.
7) There will be no significant difference between the mean scores of Posttest of Fluency in Descriptive Style of Experiment group and control group.
8) There will be no significant difference between the mean scores of Posttest of Flexibility in Descriptive Style of Experiment group and control group.
9) There will be no significant difference between the mean scores of Posttest of Originality in Descriptive Style of Experiment group and control group.
10) There will be no significant difference between the mean scores of Posttest of Elaboration in Descriptive Style of Experiment group and control group.
11) There will be no significant difference between the mean scores of Posttest of Fluency in Vocabulary Style of Experiment group and control group.
12) There will be no significant difference between the mean scores of Posttest of Flexibility in Vocabulary Style of Experiment group and control group.
13) There will be no significant difference between the mean scores of Posttest of Originality in Vocabulary Style of Experiment group and control group.
14) There will be no significant difference between the mean scores of Posttest of Total Fluency of Experiment group and control group.
15) There will be no significant difference between the mean scores of Posttest of Total Flexibility of Experiment group and control group.
16) There will be no significant difference between the mean scores of Posttest of Total Originality of Experiment group and control group.

17) There will be no significant difference between the mean scores of Posttest of Total Elaboration of Experiment group and control group.

b) Comparison of Post test scores of Verbal Creative Thinking test of experiment group and Control Group of Experiment I and Experiment II

1) There will be no significant difference between the mean scores of Posttest of Fluency of Experiment group and control group.

2) There will be no significant difference between the mean scores of Posttest of Flexibility of Experiment group and control group.

3) There will be no significant difference between the mean scores of Posttest of Originality of Experiment group and control group.

4) There will be no significant difference between the mean scores of Posttest of Total Creative Thinking of Experiment group and control group.

c) Comparison of Pre test scores and Post test scores of Language Creativity Test in English of experiment group of Experiment I and Experiment II

1) There will be no significant difference between the mean scores of Pretest and Post Test of Fluency in Plot Building of Experiment group.

2) There will be no significant difference between the mean scores of Pretest and Post Test of Originality in Plot Building of Experiment group.

3) There will be no significant difference between the mean scores of Pretest and Post Test of Fluency in Dialogue Writing of Experiment group.

4) There will be no significant difference between the mean scores of Pretest and Post Test of Originality in Dialogue Writing of Experiment group.

5) There will be no significant difference between the mean scores of Pretest and Post Test of Fluency in Poetic Diction of Experiment group.

6) There will be no significant difference between the mean scores of Pretest and Post Test of Originality in Poetic Diction of Experiment group.
7) There will be no significant difference between the mean scores of Pretest and Post Test of Fluency in Descriptive Style of Experiment group.

8) There will be no significant difference between the mean scores of Pretest and Post Test of Flexibility in Descriptive Style of Experiment group.

9) There will be no significant difference between the mean scores of Pretest and Post Test of Originality in Descriptive Style of Experiment group.

10) There will be no significant difference between the mean scores of Pretest and Post Test of Elaboration in Descriptive Style of Experiment group.

11) There will be no significant difference between the mean scores of Pretest and Post Test of Fluency in Vocabulary Style of Experiment group.

12) There will be no significant difference between the mean scores of Pretest and Post Test of Flexibility in Vocabulary Style of Experiment group.

13) There will be no significant difference between the mean scores of Pretest and Post Test of Originality in Vocabulary Style of Experiment group.

14) There will be no significant difference between the mean scores of Pretest and Post Test of Total Fluency of Experiment group.

15) There will be no significant difference between the mean scores of Pretest and Post Test of Total Flexibility of Experiment group.

16) There will be no significant difference between the mean scores of Pretest and Post Test of Total Originality of Experiment group.

17) There will be no significant difference between the mean scores of Pretest and Post Test of Total Elaboration of Experiment group.

D) Comparison of Pretest and Post test scores of Verbal Creative Thinking test of Experiment group of Experiment I and Experiment II

1) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency of Experiment group.

2) There will be no significant difference between the mean scores of Pretest and Posttest of Flexibility of Experiment group.
3) There will be no significant difference between the mean scores of Pretest and Posttest of Originality of Experiment group.

4) There will be no significant difference between the mean scores of Pretest and Posttest of Total Creative Thinking of Experiment group.

e) Comparison of Pretest and Post test scores of English Language Creativity Test of Control Group of Experiment I and Experiment II

1) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency in Plot Building of control group.

2) There will be no significant difference between the mean scores of Pretest and Posttest of Originality in Plot Building of control group.

3) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency in Dialogue Writing of control group.

4) There will be no significant difference between the mean scores of Pretest and Posttest of Originality in Dialogue Writing of control group.

5) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency in Poetic Diction of control group.

6) There will be no significant difference between the mean scores of Pretest and Posttest of Originality in Poetic Diction of control group.

7) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency in Descriptive Style of control group.

8) There will be no significant difference between the mean scores of Pretest and Posttest of Flexibility in Descriptive Style of control group.

9) There will be no significant difference between the mean scores of Pretest and Posttest of Originality in Descriptive Style of control group.

10) There will be no significant difference between the mean scores of Pretest and Posttest of Elaboration in Descriptive Style of control group.

11) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency in Vocabulary Style of control group.
12) There will be no significant difference between the mean scores of Pretest and Posttest of Flexibility in Vocabulary Style of control group.

13) There will be no significant difference between the mean scores of Pretest and Posttest of Originality in Vocabulary Style of control group.

14) There will be no significant difference between the mean scores of Pretest and Posttest of Total Fluency of control group.

15) There will be no significant difference between the mean scores of Pretest and Posttest of Total Flexibility of control group.

16) There will be no significant difference between the mean scores of Pretest and Posttest of Total Originality of control group.

17) There will be no significant difference between the mean scores of Pretest and Posttest of Total Elaboration of control group.

f) Comparison of Pretest and Post test scores of Verbal Creative Thinking Test of Control Group of Experiment I and Experiment II

1) There will be no significant difference between the mean scores of Pretest and Posttest of Fluency of control group.

2) There will be no significant difference between the mean scores of Pretest and Posttest of Flexibility of control group.

3) There will be no significant difference between the mean scores of Pretest and Posttest of Originality of control group.

4) There will be no significant difference between the mean scores of Pretest and Posttest of Total Creative Thinking of control group.

❖ Research Method:

Researcher has selected equivalent experimental group-controlled group pretest-posttest design. Before treatment English Language Creativity Test and Verbal Creative Thinking Test were administered in both the groups. And scores of fluency, flexibility, originality and elaboration were obtained. Experimental group was given treatment for creative writing in English using Synectics Method and Controlled group was given treatment for creative writing in English using
Conventional Method. After treatment English Language Creativity Test and Verbal Creative Thinking Test were administered in both the groups. And scores of fluency, flexibility, originality and elaboration were obtained.

- **Tools for data collection:**

  Following tools were used for data collection.

  1) English Language Creativity Test

     For language creative writing following components were selected:

     - Fluency and Originality in Plot building
     - Fluency and Originality in Dialogue writing
     - Fluency and Originality in Poetic diction
     - Fluency, Flexibility, Originality and Elaboration in Descriptive style
     - Fluency, Flexibility and Originality in Vocabulary Style
     - Total Fluency, Total Flexibility, Total Originality and Total
     - Elaboration of Language Creativity Test in English.

  2) Verbal Creative Thinking Test

- **Data Analysis:**

  Descriptive statistics of Verbal Creative Thinking Test and English Language Creativity Test of experimental group and control group were computed using SPSS. To test the hypotheses F test one way ANOVA was computed using SPSS.

- **Research Findings:**

  Research Findings were:

  A. Findings of Experiment – 1

     1) It is found that Synectics method of teaching is effective than the conventional method of teaching on development of Language Creativity in English.

     2) Synectics method of teaching is effective in developing fluency in Plot Building of the students of Experimental group than that of Control group.
3) Synectics method of teaching is effective in developing Originality in Plot Building of the students of experimental group than that of control group.
4) Synectics method of teaching is effective in developing Originality in Plot Building of the students of experimental group than that of control group.
5) Synectics method of teaching is effective in developing fluency in Dialogue Writing of the students of Experimental group than that of Control group.
6) Synectics method of teaching is effective in developing Originality in Dialogue Writing of the students of Experimental group than that of Control group.
7) Synectics method of teaching is effective in developing fluency I Poetic Diction of the students of Experimental group than that of Control group.
8) Synectics method of teaching is effective in developing Originality in Poetic Diction of the students of Experimental group than that of Control group.
9) Synectics method of teaching is effective in developing fluency in Descriptive Style of the students of Experimental group than that of Control group.
10) Synectics method of teaching is effective in developing Flexibility in Descriptive Style of the students of Experimental group than that of Control group.
11) Synectics method of teaching is effective in developing Originality in Descriptive Style of the students of Experimental group than that of Control group.
12) Synectics method of teaching is effective in developing Elaboration in Descriptive Style of the students of Experimental group than that of Control group.
13) Synectics method of teaching is effective in developing fluency in Vocabulary Style of the students of Experimental group than that of Control group.
14) Synectics method of teaching is effective in developing flexibility in Vocabulary Style of the students of Experimental group than that of Control group.

15) Synectics method of teaching is effective in developing Originality in Vocabulary Style of the students of Experimental group than that of Control group.

16) Synectics method of teaching is effective in developing total fluency of language creativity test in English.

17) Synectics method of teaching is effective in developing total flexibility of language creativity test in English.

18) Synectics method of teaching is effective in developing total originality of language creativity test in English.

19) Synectics method of teaching is effective in developing total elaboration of language creativity test in English.

20) Synectics method of teaching is effective in developing Fluency of Verbal Creative Thinking Test.

21) Synectics method of teaching is effective in developing Flexibility of Verbal Creative Thinking Test.

22) Synectics method of teaching is effective in developing Originality of Verbal Creative Thinking Test.

23) Synectics method of teaching is effective in developing total creative thinking of Verbal Creative Thinking Test.

B. Findings of Experiment – 2

1) It is found that Synectics method of teaching is effective than the conventional method of teaching on development of Language Creativity in English.

2) Synectics method of teaching is effective in developing fluency in Plot Building of the students of Experimental group than that of Control group.
3) Synectics method of teaching is effective in developing Originality in Plot Building of the students of experimental group than that of control group.

4) Synectics method of teaching is effective in developing fluency in Dialogue Writing of the students of Experimental group than that of Control group.

5) Synectics method of teaching is effective in developing Originality in Dialogue Writing of the students of Experimental group than that of Control group.

6) Synectics method of teaching is effective in developing fluency in Poetic Diction of the students of Experimental group than that of Control group.

7) Synectics method of teaching is effective in developing Originality in Poetic Diction of the students of Experimental group than that of Control group.

8) Synectics method of teaching is effective in developing fluency in Descriptive Style of the students of Experimental group than that of Control group.

9) Synectics method of teaching is effective in developing Flexibility in Descriptive Style of the students of Experimental group than that of Control group.

10) Synectics method of teaching is effective in developing Originality in Descriptive Style of the students of Experimental group than that of Control group.

11) Synectics method of teaching is effective in developing Elaboration in Descriptive Style of the students of Experimental group than that of Control group.

12) Synectics method of teaching is effective in developing fluency in Vocabulary Style of the students of Experimental group than that of Control group.
13) Synectics method of teaching is effective in developing flexibility in Vocabulary Style of the students of Experimental group than that of Control group.

14) Synectics method of teaching is effective in developing Originality in Vocabulary Style of the students of Experimental group than that of Control group.

15) Synectics method of teaching is effective in developing total fluency of language creativity test in English.

16) Synectics method of teaching is effective in developing total flexibility of language creativity test in English.

17) Synectics method of teaching is effective in developing total originality of language creativity test in English.

18) Synectics method of teaching is effective in developing total elaboration of language creativity test in English.

19) Synectics method of teaching is effective in developing Fluency of Verbal Creative Thinking Test.

20) Synectics method of teaching is effective in developing Flexibility of Verbal Creative Thinking Test.

21) Synectics method of teaching is effective in developing Originality of Verbal Creative Thinking Test.

22) Synectics method of teaching is effective in developing total creative thinking of Verbal Creative Thinking Test.

**Study: 8**

- **Name:** Methinee Wongwanich Rumpagaporn

- **Title:**

  “Students’ Critical Thinking Skills, Attitudes to ICT and Perceptions of ICT Classroom Learning Environments under the ICT Schools Pilot Project in Thailand.”
University: School of Education, University of Adelaide, Australia (Ph.D.)

Year: May 2007

Objectives:
Objectives set for the research were:

1) To examine the integration of information and communication technology (ICT) into computer-based classroom learning environments in Thailand.
2) To what extent school in Thai ICT schools pilot project had classroom learning environments which were related to two student outcomes (critical thinking skills and attitudes to ICT)
3) To what extent the classroom learning environments were associated with certain teacher characteristics.

Research Method:
Both analytical and descriptive research methods were used to investigate relationships in the research.

Tools for data collection:
Were collected from 13 model ICT schools by means of questionnaires (150 students and 16 teachers from eight ICT schools), interview surveys (30 students and 5 teachers from 10 ICT schools) and computer-based classroom observations in 22 classrooms from all 13 ICT schools.

Data Analysis:
Statistical techniques as well as qualitative analysis were used to examine the research propositions that were constructed from the research model. Because of the hierarchical nature of the data, hierarchical linear modeling (HLM) was used to examine the relationships between the student outcome and the independent predictors, which were influenced by teacher factors such as their teachers’ individual backgrounds, teachers’ critical thinking skills and teachers’ attitudes toward ICT.
Research Findings:

1) Students could be assisted to learn critical thinking skills through integrating ICT into teaching and learning processes.
2) The present study concluded that successfully incorporating ICT into teaching and learning is fundamentally dependent on teaching roles (i.e., to promote active and autonomous learning, increase more cooperative learning and assignments, and assist students to construct their own knowledge and share it with other students) and school management, regarding the allocation of school budgets for ICT, the use of classrooms’ ICT infrastructure, and the establishment of effective school organizational structures.
3) The improvement of classroom learning environments with ICT involves the potential ways of providing effective and efficient instruction through both teachers’ and students’ integration of ICT into overall teaching and learning processes in the school classroom environments.
4) Students who had positive perceptions of co-operative classroom learning environments were more likely to have higher scores for the deduction assumption critical thinking skills.

Study: 9

- **Name:** S. P. Malhotra
- **Title:** “Effect of the Synectics Method of teaching on the development of language creativity in Hindi.”
- **University:** Kurukshetra UNIV. [ERIC Funded]
- **Year:** 1989
- **Objectives:**

To find out the effects of the Synectics Method of teaching on the improvement of fluency, flexibility, originality and elaboration factors and their summated scores with respect to
(a) Plot building
(b) Dialogue writing
(c) Poetic diction
(d) Descriptive style
(e) Vocabulary test
(f) Total language creativity.

❖ Research Method:
As per the objectives, a four-way factorial (2x3x3x2) quasi-experimental design was used in the study.

❖ Tools for data collection:
The study employed two types of tools, i.e. teaching and measuring tools. The teaching tools included Lesson Plan Formats, Lesson Plans, Lesson Plan Guide and Worksheets. The measuring tools included Language Creativity Test developed by Malhotra and Sucheta Kulshreshta’s Socio-economic Status Scale (Urban).

❖ Data Analysis:
As per the objectives, a four-way factorial (2x3x3x2) ANOVA and t-ratio were employed.

❖ Research Findings:
1) The students who were exposed to the Synectics Method of teaching showed significant improvement on all the four factors, viz. fluency, flexibility, originality and elaboration as well as on their total scores of the plot building aspect of language creativity. With levels of intelligence, the students showed more improvement in all the four factors, i.e. fluency, flexibility, originality, elaboration as well as on their counterparts. The levels of socio-economic status did not show any such difference. However, after the treatment, students of low SES showed higher improvement than their counterparts.
2) The Synectics Method of teaching affected the improvement of the students on all the four factors, viz. fluency, flexibility, originality and elaboration as well as on dialogue writing aspect of language creativity. However, the improvement was not attribute to levels of intelligence and socio-economic status as the F ratio was not significant.

3) The students after the treatment of the Synectics Method of teaching showed improvement on the poetic diction aspect of language creativity. They also showed improvement in all the four factors, i.e. fluency, flexibility, originality and elaboration. The levels of intelligence did not affect the improvement on all the four factors (e.g. fluency) but it did affect factors like flexibility, originality and elaboration as well as their total scores. High intelligent students showed more improvement on these factors than their counterparts. Levels of socio-economic status did not show any difference.

4) The treatment affected improvement on all the four factors, viz. fluency, flexibility, originality and elaboration, as well as on their total scores of the descriptive-style aspect of language creativity. The Synectics Method of teaching significantly differed in its effectiveness from that of conventional method. High-intelligent students showed more improvement on all the four factors, viz. fluency, flexibility, originality and elaboration, as well as on their total creativity scores than their counterparts. The levels of socio-economic status did not affect the scores of the students. Further, the students of low socio-economic status showed more improvement after the treatment than their counterparts.

5) The groups of students who were exposed to the Synectics Method of teaching showed significant improvement on all the four factors, viz. fluency, flexibility, originality and elaboration, as well as on their total scores of vocabulary test aspect of language creativity. The levels of intelligence also affected the improvement in the case of the total score. Levels of socio-economic status did not show such difference.
6) The treatment affected improvement in the students on language creativity scores. After the treatment, the students who were exposed to the Synectics method of teaching showed significant improvement on fluency, flexibility, originality and elaboration and total scores of language creativity. Besides the treatment, levels of intelligence also affected the improvement. High intelligent students showed more improvement on fluency, flexibility, originality, elaboration and total scores of language creativity than their counterparts. Levels of SES also showed a contribution in improving language creativity amongst students. After the treatment, the students of high SES showed the highest improvement on the factor of fluency.

Study: 10

- **Name:** Sesadeba Pany
- **Title:** "Effectiveness of Synectics Model of Teaching in enhancing creativity, academic achievement and achievement motivation of learners"
- **Year:** 2008
- **Objectives:**
  
  The study was undertaken with the following objectives;

  1) To study the effectiveness of the Making Familiar Strange (MFS) approach of synectics model of teaching on development of learners' creative thinking ability

  2) To study the impact of MFS approach of synectics model of teaching on development of learners achievement in the subject general science and

  3) To study the impacts of MFS approach of synectics model of teaching on achievement motivation of the learners.

- **Hypotheses:**

  The following hypotheses were formulated and tested in the process of investigation through appropriate techniques;
1) The Making Familiar Strange (MFS) approach of synectics model of teaching has no significant impact on the creative thinking ability of the learners.

2) The MFS approach of synectics model of teaching has no significant impact on learners’ achievement in General Science.

3) The MFS approach of teaching has no significant impact on learners’ achievement motivation.

❖ **Research Method & Tools for data collection:**

The investigator of the present study followed the non-equivalent control group design of quasi-experimental type. For the purpose of experimentation two primary schools of Bhubaneswar city having almost similar facility were randomly selected out of four apparently similar type of schools with regard to their management, infrastructural facility; teacher and student strength. All the 35 subjects of the experimental group and 36 subjects of the control group were subjected to the teaching of 18 lessons on General science. The experimental group was taught by the investigator himself by following the MFS approach of Synectics model of teaching whereas the control group was taught by their regular class teacher by following the traditional method of teaching. Further, for the purpose of the assessing creative ability, academic achievement and achievement motivation the investigator had used the verbal and non-verbal test of creativity as developed and standardized by Baqer Mehdi (1985); comprehensive achievement test on General science and achievement motivation inventory as developed and standardized by the investigator himself. The subjects of both the groups were pre and post tested on all the dependent variables such as; creativity, academic achievement and achievement motivation. The pretest scores of both the control and experimental groups were found almost equivalent when tested for their normality of distribution.

❖ **Data Analysis:**

As such, all the hypotheses were tested by means as applying the T test statistical technique.
Research Major Findings:
The major findings of the study are presented briefly in the following:

The Making Familiar Strange (MFS) approach of synectics model of teaching was found to be effective in enhancing the creative thinking ability of the learners. The MFS approach of synectics model of teaching did not prove to be effective in enhancing the achievement motivation of the learners. The MFS approach of synectics model of teaching did not put any significant impact upon the achievement of the learners in the subject General Science.

Conclusion:

Creativity as one of the important psychological construct is found among the entire individual in different degrees. It is not only essential for individual development rather has substantial contribution towards the growth than development of civilization from various angles. Therefore, attempts through appropriate teaching strategies like synectics model of teaching should be taken for enhancing such ability among the learners. It may also be suggested that steps may be taken to apply this approach with necessary modification for developing the academic achievement of the learner’s indifferent curricular areas and achievement motivation of the learners. However, the results of the present study do not encourage the use of the MFS approach in teaching with the objectives of enhancing academic achievement and achievement motivation.

Study: 11

- **Name:** Angela Alexander
- **Title:** “A Qualitative Exploration of Students’ Experiences with Tutorial Learning”
- **University:** Northeast Louisiana University
- **Year:** August, 2004
- **Objectives:**
Following objectives were set for research,

1) Investigated the experiences of students engaged in tutorial learning.
2) Explored the characteristics of college students receiving tutorial assistance according to the personality type as indicated by the Myers-Briggs Type Indicator (MBTI).
3) Investigated in what ways, if any, do students’ interpretations of their tutorial experiences vary based on the MBTI?

❖ **Research Question:**

The research questions to be investigated in this study were:

1) What are students’ perceptions of their tutorial learning experiences?
2) Are students’ perceptions of their tutorial learning experiences related to personality type preferences?

❖ **Research Method:**

Based on this collection of reasons, qualitative methods were appropriate for this study. The best-suited approach to this particular case came from the phenomenological perspective.

❖ **Tools for data collection:**

Following tools were used for data collection:

a) participation in the setting
b) direct observation
c) in-depth interviews
d) Document analysis.

❖ **Data Analysis:**

Data analysis in qualitative research has three-phase procedure described,

a) data reduction
b) data display
c) Conclusion drawing and verification.
Research Major Findings:

The major findings of the study are presented briefly in the following:

1) The participating tutees revealed their reasons to attend tutorial learning as an acknowledgement of needed skill development in the area of math and the desire to receive personal feedback as they attempted to meet the challenge that was placed before them.

2) Once the decision was made to receive tutoring, the relationships with the tutor became a salient factor in their perceptions of the service. Students identified their relationships with tutors to be a significant factor in their quest to successfully build their math skills through the tutoring process.

3) So that tutees might be able to increase their odds of success in math, the implementation of learning strategies was a necessary skill for them to learn in tutoring sessions. Students identified learning strategies gained as a result of tutorial learning.

4) According to participants, the emerged derived benefits from tutoring were in the areas of improved grades, comprehension, and confidence.

3.5 Review Of Articles On Experiential Learning & Learning Style:

Article: 1

- **Name:** Nail Yildirim
- **Title:** “Increasing Effectiveness of Strategic Planning Seminars through Learning Style”
- **Year:** 2010 (Australian Journal of Teacher Education)
- **University:** Gaziosmanpasa University, Turkey
- **Objectives:**

  This research tests the effectiveness of taking learning style variables from the Kolb learning model in designing strategic planning seminars.
Research Questions:

There are two important differences about how we learn and understand, or how we acquire knowledge. The first of these differences is how we perceive information? The second difference is how we process information?

Research Method:

The methodology of this study was action research. Action research is a social situation study aimed at improving the quality of actions within that social situation (Eliot, 1991, translation by Aksoy, 2003). The target population of the study was composed of 216 education professionals who participated in an in-service training on strategic planning.

Tools for data collection:

In order to evaluate the success of the seminar, we prepared a questionnaire. We asked questions based on a 5-point Likert Scale, such as “What level do you consider the effectiveness of the seminar program designed and implemented in accordance with Kolb learning model?” Answers given to the questions by the participants were on a scale from very good to very bad, including: Very good (5), Good (4), Medium (3), Bad (2), and Very bad (1).

Data analysis:

The questionnaire distributed and completed by the participants after the seminar. We analyzed and interpreted the data from the questionnaire using the statistical SPSS 11.00 program. We assessed the effectiveness level of the seminar using arithmetic average and percentage calculations. We also included open-ended questions in the questionnaire and requested the opinions of the participants about the seminar. We analyzed the opinions of the participants using the qualitative technique document analysis.

Research findings:

Findings were given by answering research questions:
First, we analyzed the effectiveness levels of each of the steps implemented in the seminar according to the participants. The table below shows how the participants rated each of these steps on the Likert 5-point scale, with a rating of 1 being very bad, and rating of 5 being very good.

We present our findings on the quality of the participants’ schools’ strategic plans. The participants prepared these plans after the seminar, and delivered them to the Tokat National Education Directorate.

Article: 2

▶ Name: Dominick E. Fazarro
▶ Title: “The Effectiveness of Instructional Methods based on Learning Style Preferences of Agricultural Students: A Research Tool for Continuous Improvement for Faculty in Career and Technical Education (CTE) Programs.”
▶ Year: 2009 (Journal of Industrial Teacher Education)
▶ University: Sam Houston State University
▶ Objectives:

Specifically, the objectives which guided the study were:

1) To determine the learning style preferences of undergraduate agricultural students enrolled in a given Soil Science course.

2) To ascertain if there were differences in the students’ course grade average (CGA) in the given Soil Science course when the treatment group were taught according to their learning style preferences versus the control group.

▶ Research Questions:

There are two research questions which the study addressed:

1) What is the learning style preferences of undergraduate agricultural students enrolled in a given Soil Science class?
2) Is there a difference in the students’ course grade average (CGA) in the Soil Science class when the treatment group is taught according to their learning style preferences versus that of the control group?

❖ **Research Method:**

To answer the research questions and hypothesis statement, the research design for this study required a treatment group and a control group. The treatment group consisted of students enrolled in a Soil Science course (AGR 344) for the fall semester of 2007 with instructor A. The control group represents students enrolled in a Soil Science course (AGR 344) in the spring semester of 2008 with instructor B.

❖ **Tools for data collection:**

The Tools used in the study was the Productivity Environmental Preference Survey (PEPS), which is based on the Dunn and Dunn Learning Style Model. PEPS are a comprehensive approach to identify how adults would prefer to learn and concentrate in work environments or educational settings.

❖ **Data analysis:**

The study employed descriptive analysis and independent t-tests. The rationale for the descriptive analysis was to identify the preferred learning style preferences of the students according to the mean score of the learning style/element. The mean score of the preferred learning style was identified in the 60-80 range, the “most preferred” element. The scores generated by the PEPS were for the treatment group. The purpose for using the independent t-test was to compare the mean scores for two different groups course grade average (CGA) of the treatment group-fall 2007 versus the control group-spring 2008 and to test the hypothesis statement for significance between the groups.

❖ **Research findings:**

The learning style preferences of the students were ascertained by SPSS. The result was generated before implementation of the modified instructions to
enhance instructional approaches. Table 2 reports the preferred learning style preferences for 4 students in the soil science course.

The preferred learning style/element Structure was the most preferred among the students. From the 20 learning style/elements, Structure was frequently scored. There were 36 out of 46 students who scored several times in the most preferred range with 60, 64, 67, 70, and 74. According to the element/learning style 'Structure' is described as follows.

For standard score of 60 or more, be precise about every aspect of the assignment; permit no options; use clearly stated objectives in a simple form; list and itemize as many things as possible, leave nothing for interpretation; clearly indicate time requirements and the resources that may be used; required tasks should be indicated as successful completion is evidenced, gradually lengthen the assignment and provide some choices from among approved alternative procedures; gradually increase the number of options; establish specific working and reporting patterns and criteria as each task is completed.

For standard score of 40 or less, establish clearly stated objectives but permit choice of resources, procedures, time lines, reporting, checking, etc.; permit choice of environmental, sociological and physical elements; provide creative options and opportunities to grow and to stretch talents and abilities; review work at regular intervals but permit latitude for completion if progress is evident. Some employees may not prefer structure but require close supervision

**Article: 3**

- **Name:** Meryem Yilmaz-Soyl
- **Title:** “The effect of Learning Styles on Achievement on in Different learning Environments”
- **Year:** October 2009 (The Turkish Online Journal of Educational Technology)
- **University:** Hacettepe University, Beytepe/Ankara, Turkey
**Objectives:**

The purpose of this study is to investigate the effect of learning styles on students’ achievement in different learning environments which were designed according to principles of Generative Theory of Multimedia Learning.

**Research Questions:**

1) What is the effect of learning styles on success in a text-based learning environment?
2) What is the effect of learning styles on success in a narration-based learning environment?
3) What is the effect of learning styles on success in a computer-mediated (narration + music + text + static picture) learning environment?

**Research Method:**

The method of the study is pre-posttest experimental method. In this study, achievement is the dependent variable whereas different learning environments and learning styles are independent variables.

**Tools for data collection:**

In this study pre-posttests including 30 items concerning the behaviors to be gained in three different learning environments and Kolb’s Learning Style Inventory are used to collect data.

**Data analysis:**

The data collected in this study were analyzed through repeated measures of one way ANOVA test.

**Research findings:**

The findings of the study are presented in the order of aforementioned research questions.

1) The pretest and posttest score means of students having assimilator and converge learning styles differentiate in favor of posttest. As seen the achievement of learners who have different learning styles in text-based
learning environment does not show a statistically significant change (p = .98). The absence of a significant difference among the scores of students having different learning styles though the achievement increases may be due to the fact that students having assimilator and convergent learning styles have common ability to organize and use the information they acquire from the text.

2) The pretest and posttest score means of students having assimilator and convergent learning styles differentiate in favor of posttest. The achievement of learners who have different learning styles in narration-based learning environment does not show a statistically significant change (p = .53). The absence of a significant difference among the scores of students having different learning styles though the achievement increases may be due to the fact that students having assimilator and convergent learning styles have the opportunity in narration-based learning environment to make use of their own studying strategies (note-taking, etc.) and ask the points they have not understood and due to the style of communication between the course instructor and students through the methods and techniques used in the course. Currie (1995) indicates that assimilator and converge students are more successful in classroom environments where narration and discussion methods are used. Furthermore, Sein and Robey (1991) observed that assimilator and convergent students had comparable successes in comparable learning environments.

3) The mean pretest and posttest scores of students having assimilator and convergent learning styles differentiate in favor of posttest. The achievement of learners who have different learning styles learners in a computer-mediated (narration + music + text + static picture) does not show a statistically significant change.

**Article: 4**

- **Name:** Gokhale Anuradha A.
- **Title:** “Collaborative Learning Enhances Critical Thinking”
This article was taken from the journal of technology education (vol.7, Number 1, Fall, 1995). It was a research study published in this journal.

❖ **Objectives:**

1) To examine the effectiveness of individual learning versus collaborative learning in enhancing drill-and-practice skills and critical-thinking skills.

2) Learning in enhancing drill-and-practice skills and critical-thinking skills.

❖ **Research Questions:**

Research questions examined in this study were:

1) Will there be a significant difference in achievement on a test comprised of “drill-and practice” items between students learning individually and students learning collaboratively?

2) Will there be a significant difference in achievement on a test comprised of “critical-thinking” items between students learning individually and students learning collaboratively?

❖ **Research Method:**

A nonequivalent control group design was used in this study. Pretest and Posttest were administered on the students.

❖ **Tools for data collection:**

Investigator designed pretest and post test to measure student understanding of series and parallel DC circuits and hence belonged to the cognitive domain.

❖ **Data analysis:**

T-test, analysis of covariance procedure and correlation statistics were used for data analysis.

❖ **Research findings:**

Findings were given by answering research questions:

1) Research question 1: the mean of the post test scores for the participants in the group that studied collaboratively was slightly higher than the group that studied individually. A t-test on the data did not show a significant difference between the groups.
2) Research question 2: the mean of the posttest scores for the participants in the
group that studied collaboratively was higher than the group that studied
individually. A t-test on the data showed that this difference was significant at
the 0.01 alpha levels.

Article: 5

❖ Name: Aytac GogusA
❖ Title:

“Learning Styles and Effective Learning Habits of University Students:
A Case from Turkey”

❖ University: Center for Individual and Academic Development (CIAD)
Sabanci University Istanbul, Turkey (College Student Journal)

This study investigates learning styles and effective learning habits in a
Turkish University. Research based on a small private university in Istanbul found
that the percentages of undergraduate students examined by Kolb's Leaning Style
Inventory listed in rank order from most to least were converges first, assimilators
second, accommodators and diverges (almost equal percentages) last.

The presented study mainly investigates effective leaning habits and
leaning styles of undergraduate students in a Turkish university. This study aims
to explore the relationships between students' leaning styles, their effective leaning
habits, their academic performance, and their skills and demographic
characteristics such as weekly time management, study planning. Gender, grade
level, faculty and living arrangements. The study addresses the following
questions:
1) Which leaning styles do students present?
2) How do students' effective learning habits relate to their demographic
characteristics such as gender, faculty, grade level and skills such as weekly
time management, and study planning?
3) How do students' effective learning habits relate to their academic performance?

4) Is there a linkage between learning styles and effective learning habits?

Participants were the undergraduate students of a small private university in Istanbul, Turkey. The survey instrument, the aim of the research and the consent form were mentioned to undergraduate students via e-mail and also by means of students who took the course Project 102 in the 2009-2010 Spring semesters. 512 volunteer students participated in this study. Each application lasted approximately half an hour. From the total of 512 volunteer participants, 94 students did not respond to all items in the survey. Therefore, only the responses of 418 students were analyzed. There were three sections in the instrument: background information, learning style inventory (Kolb 1985), and learning habits. Excel and SPSS were used during analyses of the data.

The effective learner can use any of the four styles in different learning situations rather than relying only on his/her preferred style. This shows that learning styles are neither better, nor worse than each other. Nevertheless, four learning styles are compared in terms of using effective ways of leaning by conducting a one way ANOVA. As expected, no significant differences were yielded $F (3,417) = .359, p > .05$. In other words, using different learning styles (diverging, accommodating, converging, and assimilating) did not make any contribution to the levels of using effective ways of leaning.

As a result, it can be proposed that emphasizing feeling and an intuitive approach were not favored by SU students. This pattern did not show any variation according to certain crucial characteristics such as school, grade level, academic success, skills like time management and study planning. Although it is a mere speculation, it could be proposed that students, at least in SU, seemed very conservative when learning styles were at issue. At present, Turkey has 156 universities (103 public, 53 private) and since the number of students motivated to get into higher education exceeds the capacity of the university system, nationwide
university placement examination is held on an annual basis. The national exam is multiple-choice in nature, and consists of verbal and quantitative aptitude tests. High school education is unfortunately devoted to prepare students for the ultimate goal, which is to be successful on this exam. Students' main endeavor is to be good at choosing the correct answer or solution to a question. Success in high school courses are generally undermined by students, families, even instructors due to the current system. Thus, students were not provided with a leaning environment that facilitates creating theoretical models, assimilating models into an integrated explanation, carrying out plans and experiments, taking risks, viewing situations from many perspectives, being imaginative, emotional, and finally, being able to relate to people.

In conclusion, knowing the learning styles of students is highly important both for students and instructors. Knowledge of leaning styles affects students' awareness of how they learn best and contribute to their taking responsibility of their own leaning. Since instructors prefer to teach in a cognitive style that matches their own, knowing the preferred leaning styles of students can help instructors to adjust their teaching methods and evaluation tools to best match the different needs of their students finding out students' learning styles may empower their learning experiences, which should be the ultimate goal.

3.6 **Distinguish Features Of The Present Study:**

After studying and reviewing the past researches, the following distinguishing features were contemplated and incorporated in the present research.

1. Almost all the past researches were done for either college students or child of at 4 to 5. In the present study the investigator has tried to develop programme enhancing Experiential learning for students of standard IX.

2. The content matter selected by the past researcher was the part of text book in their respective subjects while the content matter selected for the present
research was beyond textbook content. This gives freedom of selecting Experiential learning oriented problems and items.

3. Past researches were based on any model or single approach while in the present research the Experiential learning programme was based on learning model & Learning Style.

4. Model of Kolb’s experiential learning in present research was taught using appropriate approaches or model wherever is possible.

5. Worksheets for students were developed for Kolb’s experiential learning programme along with detailed questions for user were developed in logical & Experience sequence is the peculiarly of this research.

6. Student’s feedback on Kolb’s experiential learning programme were collected and analyzed.

3.7 Summary:

The review of related researches on experiential learning & learning style was proved very helpful to investigator. Past researches show that efforts have been made to device a programme for enhancement of or to evaluate effectiveness of model. Investigator couldn’t found any programme related to experiential learning in India. So this research may be helpful for exploring area like measuring and enhancing experiential learning. As researches shows that experiential learning can be enhanced from early childhood, investigator’s Kolb’s experiential learning programme would be helpful for development of experiential learning at secondary level. Kolb’s experiential learning programme would also helpful to teachers for promoting experiential learning in the classroom. Next chapter no. 4 comprises of planning and procedure adopted for the present research study.