Chapter VI
Summary, Conclusions and Educational Implications
CHAPTER VI

SUMMARY, CONCLUSIONS AND EDUCATIONAL IMPLICATIONS

In the preceding chapters, introduction to the problem, objectives, hypotheses, review of literature, development of the tools, methods of the study, analysis of data and results were discussed. The present chapter has been devoted to a brief summary, conclusions and implications of the study.

In general, graphic organizer instruction are given to students by visual or graphic representation. Graphic organizer is a very good way for students to better understand information because graphic organizers are very powerful teaching tools. Graphic organizers are visual representation of knowledge. They are used to aid the comprehension of information from text, lecture and classroom discussion.

To enable students to learn important relation among concepts that are only implicit in text and outlines, researchers developed an adjunct display that uses a spatial format to represent key next ideas. The graphic organizers originally called a structured overview that was treated as something the teacher did so that students could structure and organize the “to be learned” material. The learning and retention could be facilitated by strengthening components of a learner’s existing cognitive structure. Advance organizers has been one of the most utilised methods of conveying large amounts of information within any subject area. Ausubel emphasized the “big pictures”, with the most general ideas of a subject presented first and then progressively differentiated in terms of detail and specificity. The advance organizer is a way to organizer the outline of information to be learned by way of a visual representation the graphic organizer. (Ausubel, 1968).

Graphic organizers may be used before or after delivering in the lesson, known as pre graphic organizer instruction and post organizer instruction.
6.1 NEED OF THE STUDY

Learning is a process through which we acquire new modes of behaviour or modify the existing modes of behaviour. Human behaviour is classified into three domains: cognitive (thinking), affective (feeling), and psychomotor (doing). Teaching is a purposeful activity done to facilitate learning. Teaching is an activity done to facilitate the students to acquire (factual) knowledge, to form (desirable) attitudes and to develop (required) skills.

Learning is a process of information processing. It involves reception, selective perception, semantic encoding, storing in long term memory and retrieving whenever necessary. Teaching should be arranged so as to enable the process of learning.

In the Fourth Survey of Research in Education (Buch, 1992) about 20 studies were reviewed related to teaching. But in the Fifth survey of research in education (1997), 44 studies on teaching were reviewed and placed in a separate chapter. This is a potent indicator of the momentum gained by the research on teaching.

Students often encounter difficulty when attempting to learn from an entire chapter of text that contains numerous new concepts and relations among those concepts. Educators have long been interested in easing this burden for students. Some adjunct aids of displays, such as graphic organizers have received considerable attention of the researchers, the goal being to improve recall, comprehension and retention of content by students.

A perusal of the research studies indicates that graphic organizers appear to provide readers (students) with a procedure for successfully extracting, remembering and retrieving information.

The present study proposes to investigate some significant features of graphic organizer instruction, i.e.
• What is more effective pre or post graphic organizer instruction?

• The extent to which the visual-spatial hierarchical display of expository text book information through graphic organizers facilitates the learning outcomes of students i.e. achievement and retention in social studies.

• The degree to which graphic organizers facilitate study habits of students.

6.1 STATEMENT OF THE PROBLEM

"EFFECT OF GRAPHIC ORGANIZER INSTRUCTION ON LEARNING OUTCOMES AND STUDY HABITS OF HIGH SCHOOL SOCIAL STUDIES STUDENTS”.

6.2 OBJECTIVES OF THE STUDY

• To develop instructional material based on graphic organizer instruction for teaching social studies to class IX students.

• To compare the mean gain on achievement scores in social studies of students taught by different instructional treatments.

• To study the effectiveness of the three instructional treatments for high, average and low intelligence groups.

• To study the effectiveness of the three instructional treatments for high, average and low intelligence groups at knowledge, comprehension and application categories of objectives.

• To compare the retention scores of three groups of students taught social studies through different instructional treatments.

• To study the effectiveness of the three instructional treatments for high, average and low intelligence groups with respect to retention at different categories of objectives.
• To study the effect of instructional treatment on study habits of class IX students of high, average and low intelligence.

6.3 HYPOTHESES

Hypotheses for analysis of gain scores in achievement

H₁ The three instructional treatments yield different mean gain on achievement scores in social studies.

H₂ The high, average and low intelligence groups yield different mean gains on achievement scores.

H₃ Comparable mean gains on achievement scores are yielded by the students at knowledge, comprehension and application category of objectives.

H₄ There is no significant interaction between instructional treatments and levels of intelligence.

H₅ There is no significant interaction between instructional treatments and categories of objectives.

H₆ There is no a significant interaction between levels of intelligence and categories of objectives.

H₇ The three instructional groups of three levels of intelligence exhibit comparable mean gain on achievement scores at knowledge, comprehension and application categories of objectives.

Hypotheses for analysis of retention scores

H₈ Retention is independent of instructional treatment.

H₉ Retention is independent of levels of intelligence.

H₁₀ Retention is independent of categories on objectives.

H₁₁ Students of high, average and low intelligence retain comparably when taught social studies through different instructional treatments.
H12 Students taught through different instructional treatments attain comparable retention scores at knowledge, comprehension and application categories of objectives.

H13 Students of high, average and low intelligence retain comparably at knowledge, comprehension and application category of objectives.

H14 Students of high, average and low intelligence retain comparably at knowledge, comprehension and application category of objectives when taught through different instructional treatments.

Hypotheses for analysis of scores of study habits

H15 The three instructional treatments yield comparable mean gain scores on study habits inventory.

H16 The high, average and low intelligence groups attain comparable mean gain scores on study habits inventory.

H17 There is no significant interaction between instructional treatments and levels of intelligence with respect to study habits.

6.4 DELIMITATIONS

The present study has the following delimitations:

- The study was delimited to studying the effectiveness of only pre graphic organizer instruction, post graphic organizer instruction and traditional instruction.

- On Class IX social studies students of Ropar, 12 lessons of social studies were selected for instructional treatment from syllabi of social studies prescribed by Punjab School Education Board.

- The experiment was limited to 43 working days of the academic session.
6.5 TOOLS USED

For the present investigation following tools were used.

1. Development of Criterion Test (Developed by Investigator)
2. Development of Achievement Test (Developed by Investigator)
3. Development of Instructional Material with graphic organizers (Developed by the Investigator)
4. Group Test of Intelligence (Dr. G.C. Ahuja, 1984)

6.6 SAMPLE

In a research project, researchers usually come across unmanageable population, where in large numbers are involved, so it is difficult to study the whole population. It is often desirable in order to reduce expenditure, time and energy, to produce greater precision and accuracy, a sample from a population should be taken. Sampling is the process by which a relatively small number of individuals or objects are selected and organised in order to find out something about the entire population from which it is selected. Sampling procedures provide generalizations on the basis of relatively small proportion of population.

In the present study, Group Test of Intelligence was administered to 300 students of class IX from the D.A.V. Senior Secondary School and Khalsa Senior Secondary School affiliated to P.S.E.B. of Ropar District in Punjab. Time limit for the test was 40 minutes, separate answer sheets were provided to the students. Scoring was done with the help of scoring key.

The intelligence scores of the students on Group Test of Intelligence were arranged in an ascending order. The 27 percent higher and 27 percent lower scoring subjects were selected and the middle group was also selected.
Each one of the selected groups was randomly allocated to the three subgroups. One group from the high scoring, second from the average and third from the low, were allocated to two experimental groups and similar matching group to control group. So, the final sample comprised of 180 students. It was purposive because Khalsa Senior Secondary School and D.A.V. Senior Secondary School of Ropar district in Punjab, which were approachable, were selected. It was random because IX class students, selected for experimentation were randomly allocated to the three groups viz, two experimental groups i.e. experimental group I, pre-graphic organizer instruction, experimental group II, post-graphic organizer instruction and third control group. Each group consisted of randomly allocated high, average and low intelligence level students. The three groups were as similar as the availability permitted. Their average age was 14 years.

There were 60 students of experimental group I, 60 students of experimental group II and 60 students of control group. The students of each group belonged to high, average and low intelligence level.

6.7 DESIGN OF THE STUDY

Educational research is described as experimental when the researcher has firstly, specified a set of researchable hypotheses and secondly, has established a systematic programme of data gathering under precisely defined conditions in an effort to test these hypotheses. The hypotheses provide a network of statements relating the impact of an independent variable or a set of independent variables on some outcome variable as independent variables (Ingersoll, 1984).

A good experimental design should provide some information with respect to all the objectives of the experiment (Winer, 1971). Any experimental problem has two-interrelated aspects, the design of the experiment and statistical analysis of the data. The latter aspect is directly dependent upon the former aspect. Statistical methods can greatly increase the efficiency of an
experiment and also strengthen the conclusions so obtained (Montgomery, 1984).

Accordingly, 3x3x3 factorial design combined with ANOVA (Campbell and Stanley, 1963) was employed. The factorial design was used as it permits to evaluate the combined effect of two or more experimental variables when used simultaneously.

Information from factorial design experiment is more complete than that obtained from a series of single factor experiments in the sense that evaluation of interaction effects can be made. Also the population to which inference can be made is more inclusive than the corresponding population for a single factor experiment (Winer, 1971).

ANOVA was preferred to increase the precision of analysis of the experimental data which utilized both the pre-test and post-test scores. The present study employed two replications of 3x3x3 factorial design with three fixed variables of which the measures on one variable were repeated for mean gain on achievement scores and the retention scores.

Also, 3x3 factorial design was employed for analyzing mean gain scores on achievement test.

The model was a fixed one because all the levels of the variables in each of the designs were determined on a logical basis and were not selected by sampling (Guilford and Fruchter, 1978). Computational procedure was followed according to the technique given by Winer (1971). When a factorial design follows a fixed model in the technique of ANOVA, the error term is always the “Within treatment mean Squares” (Edwards, 1971).

There were different sets of dependent variables. The first 3x3x3 factorial design was computed by ANOVA for the mean gain on achievement scores. Here instructional treatment, intelligence and category of objectives were independent variables. Gain an achievement scores was the dependent
variable which was calculated as the difference in post-test and pre-test scores for each subject.

The variable of instructional treatment was studied at three levels namely experimental group (T₁) which was taught by pre-graphic organizer instruction, experimental group (T₂) which was taught by post graphic organizer instruction and control group (T₃) which was taught by traditional instruction. The variable of intelligence was studied at three levels viz., high intelligence (I₁), Average Intelligence (I₂) and low intelligence (I₃) levels. The third variable of categories of objectives was studied at knowledge (O₁), comprehension (O₂) and application (O₃) category.

The second 3x3x3 factorial design was for retention scores. Here, the variable of instructional treatment was studied at three levels, namely experimental group I (T₁), experimental group II (T₂), and control group (T₃). The variable of intelligence was studied at three levels viz., high intelligence (I₁), Average intelligence (I₂) and low intelligence (I₃). The variable of categories of objectives was studied at three levels viz., knowledge category (O₁), comprehension category (O₂) and application category (O₃).

The third 3x3 factorial design was analyzed with the help of ANOVA for gain scores on study habits. Here instructional treatment and levels of intelligence were the independent variables and gain scores on study habits was the dependent variable. The variable of instructional treatment was studied at three levels viz., experimental group I (T₁), experimental group II (T₂) and control group (T₃). The variable of intelligence was studied at three levels viz., high intelligence (I₁), average intelligence (I₂), and low intelligence (I₃) levels.

6.8 PROCEDURE

Procedure of the experiment comprised of two main stages which are selection of the sample and conducting the experiment.
Stage 1

Selection of the sample

The present study was conducted on 180 students of class IX from the D.A.V. Senior Secondary School and Khalsa Secondary School of District Ropar in Punjab. Class IX students were selected for experimentation after administration of intelligence test to 300 class IX students (as explained under the sub-heading sample in the present chapter). Each group consisted of randomly allocated high, average and low intelligence level students.

Stage 2

Conducting the experiment

The experiment was conducted in four phases as given below:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Administration of the pre-test.</td>
</tr>
<tr>
<td>II</td>
<td>Conducting the instructional program.</td>
</tr>
<tr>
<td>III</td>
<td>Administration of the post test</td>
</tr>
<tr>
<td>IV</td>
<td>Administration of the retention test.</td>
</tr>
</tbody>
</table>

Phase I

Administration of the pre-test

This phase involved the administration of the following tests to the students of the experimental groups and control group i.e.

- Criterion test
- Study habits inventory

Separate response sheets were provided. The answer sheets were scored with the help of scoring key. The scores indicated the previous knowledge possessed by the students and their study habits.

Phase II

Conducting the instructional program.

To find the efficiency of the independent variables, the instructional treatment was manipulated in the form of teaching based on pre graphic organizer instruction and post graphic organizer instructions and traditional
teaching method. The instructional treatment was given for 46 days to the three groups. The experimental group I was taught through pre graphic organizer instruction, experimental group II was taught through post graphic organizer instruction and group III was taught through traditional instruction. Same topics were taught to the three groups. The instructions were conducted through well structured lesson plans in the content selected for treatment. The treatment was conducted by the investigator herself in all the three groups so as to minimize teacher variable and maximize precision.

Phase IV

Administration of the Post-Test

Immediately after the instructional treatment was over, the subjects were assessed on criterion measures to know the effect of the treatment. For this, the students were administered the post test for all the treatment variables using the same criterion test as the pre-test. Also students were administered study habits.

Phase V

Administration of the Retention test

Twenty days later, the criterion test was again administered to the students to get a measure of retention. Again the obtained answer sheets were scored with the help of scoring key.

6.9 STATISTICAL TECHNIQUES

The following statistical techniques were employed to analyse the data obtained from the experiment to test the hypotheses.

- Graphical representation.
- Qualitative analysis of criterion scores.
- Factorial design 3x3x3, Analysis of variance from mean gain on achievement scores.
- Factorial design 3x3x3, Analysis of variance for retention scores.
- Factorial design 3x3, Analysis of variance for gain scores on study habits.
- Descriptive statistics like mean, standard deviation of achievement scores.

For further investigation, t-test was used for testing the significance of difference between the means gain on achievement, retention and study habits of different groups.

6.11 MAJOR FINDINGS

The findings of the study have been given in the following paragraphs and all findings pertain to learning outcomes in social studies at IX Class (at high school level).

Findings pertaining to achievement in social studies
- There was a difference in the mean gains of students taught by different instructional treatments.
- Students taught by pre graphic organizer instruction exhibited better mean gains as compared to those taught by post graphic organizer instruction.
- Students taught by pre graphic organizer instruction exhibited better mean gains as compared to those taught by traditional instruction.
- Students taught by post graphic organizer instruction exhibited better mean gains as compared to those taught by traditional instruction.
- There was a difference in the mean gains of different intelligence groups.
- High intelligence group and average intelligence group yielded comparable mean gain scores.
- High int. intelligence group performed better than low intelligence group.
- Average intelligence group performed better than low intelligence group.
- There was a difference in the mean gains of students at different categories of objectives.
- At knowledge category of objectives
  - students attained better mean gain scores than at comprehension category of objectives.
• Students attained better mean gain scores than at application category of objective.

• At comprehension category of objectives
  - students attained better gain scores than at application category of objectives.

• Treatment and intelligence interacted with each other.

• High intelligence students
  - taught by pre graphic organizer instruction and post graphic organizer instruction yielded comparable mean gains.
  - taught by pre graphic organizer instruction attained better mean gains than those taught by traditional instruction.
  - taught by post graphic organizer instruction attained better mean gains than those taught by traditional instruction.

• Average intelligence students
  - taught by pre graphic organizer instruction and post graphic organizer instruction yielded comparable mean gains.
  - taught by pre graphic organizer instruction attained better mean gain than those taught by traditional instruction.
  - taught by post graphic organizer instruction attained better mean gain than those taught by traditional instruction.

• Low intelligence students
  - taught by pre graphic organizer instruction attained better mean gain than those taught by post graphic organizer instruction.
  - taught by pre graphic organizer instruction attained better mean gain than those taught by traditional instruction.
  - taught by post graphic organizer instruction attained better mean gain than those taught by traditional instruction.

• When taught by pre graphic organizer instruction
  - high intelligence students attained better than mean than average intelligence students.
- high intelligence students attained better mean gains than low intelligence students.
- average intelligence students attained better mean gains than low intelligence students.
- When taught by post graphic organizer instruction
  - high intelligence students attained better mean gains than average intelligence students.
  - high intelligence students attained better mean gains than low int. students.
  - average intelligence students attained better mean gains than low intelligence students.
- Treatment and category of objectives did not interact with each other.
- Intelligence and category of objectives interact with each other.
- High intelligence students
  - at knowledge and comprehension category of objectives yielded comparable mean gains.
  - attained better mean gains at knowledge than application category of objectives.
  - attained better mean gains at comprehension that application category of objectives.
- Average intelligence students
  - attained better mean gains at knowledge that comprehension category of objectives.
  - attained better mean gains at knowledge than at application category of objectives.
  - attained better mean gains at comprehension than at application category of objectives.
- Low intelligence students
  - attained better mean gains at knowledge than at comprehension category of objectives.
- attained better mean gains at knowledge than at application category of objectives.
- attained better mean gains at comprehension than at application category of objectives.

- At knowledge category of objectives
  - high intelligence students attained better mean gains than average intelligence students
  - average intelligence students attained better mean gains than low intelligence students.

- At comprehension category of objectives
  - high intelligence students attained better mean gains than average intelligence students.
  - average intelligence students attained better mean gains than low intelligence students.

- At applications category of objectives
  - high intelligence students attained better mean gains than average intelligence students
  - average and low intelligence students attained comparable mean gains.

- Treatment, intelligence and category of objectives did not interact with one another.

Findings pertaining to retention in social studies

- There was a difference in the retention score of students taught by different instructional treatments.

- Students taught by pre graphic organizer instruction retained better as compared to those taught by post graphic organizer instruction.

- Students taught by pre graphic organizer instruction retained better as compared to those taught by traditional instruction.

- Students taught by post graphic organizer instruction retained better as compared to those taught by traditional instruction.
- There was a difference in the retention scores of different intelligence groups.
- High intelligence group retained better than average intelligence group.
- High intelligence group retained better than low intelligence group.
- Average intelligence group retained better than low intelligence group.
- There was a difference in retention scores at different categories of objectives.
- Students retained better at comprehension than knowledge category of objectives.
- At knowledge category of objectives students retained better than application category of objectives.
- At comprehension category of objectives students retained better than application category of objectives.
- Treatment and intelligence interacted with each other.
- High int. students
  - taught by pre graphic organizer instruction retained better than those taught by post graphic organizer instruction.
  - taught by pre graphic organizer instruction retained better than those taught by traditional instruction.
  - taught by post graphic organizer instruction retained better than those taught by traditional instruction.
- Average intelligence students
  - taught by pre graphic organizer instruction and post graphic organizer instruction yielded comparable retention scores
  - taught by pre graphic organizer instruction retained better than those taught by traditional instruction.
  - taught by post graphic organizer instruction retained better than those taught by traditional instruction.
• Low intelligence students
  - taught by pre graphic organizer instruction retained better than those taught by post graphic organizer instruction.
  - taught by pre graphic organizer instruction retained better than those taught by traditional instruction.
  - taught by post graphic organizer instruction and traditional instruction yielded comparable retention scores.

• When taught by pre graphic organizer instruction
  - high intelligence students retained better than average intelligence students.
  - high intelligence students retained better than low intelligence students.
  - average intelligence students and low intelligence students yielded comparable retention scores.

• When taught by post graphic organizer instruction
  - high intelligence students retained better than average intelligence students.
  - high intelligence students retained better than low intelligence students.
  - average intelligence students retained better than low intelligence students.

• Treatment and categories of objectives interacted with each other.

• At knowledge categories of objectives
  - students taught by pre graphic organizer instruction retained better than post graphic organizer instruction.
  - students taught by pre graphic organizer instruction retained better than traditional instruction.
  - students taught by post graphic organizer instruction retained better than traditional instruction.
• At comprehension categories of objectives
  - students taught by pre graphic organizer instruction and post graphic organizer instruction yielded comparable retention scores.
  - students taught by pre graphic organizer instruction and traditional instruction yielded comparable retention scores.
  - students taught by post graphic organizer instruction and traditional instruction yielded comparable retention scores.
• At application categories of objectives
  - students taught by pre graphic organizer instruction and post graphic organizer instruction yielded comparable retention scores.
  - students taught by pre graphic organizer instruction retained better than those taught by traditional instruction.
  - students taught by post graphic organizer instruction retained better than those taught by traditional instruction.
• When taught by pre graphic organizer instruction
  - students retained comparably at knowledge and comprehension category of objectives.
  - students retained better at knowledge than application category of objectives.
  - students retained better at comprehension than application category of objectives.
• When taught by post graphic organizer instruction
  - students retained better at comprehension than knowledge category of objectives.
  - students retained better at knowledge than application category of objectives.
  - students retained better at comprehension than application category of objectives.
• Intelligence and category of objectives interacted with each other.
• High intelligence students

207
- at knowledge and comprehension categories of objectives retained comparable.
- retained better at knowledge than application category of objectives.
- retained better at comprehension than application category of objectives.

• Average intelligence students
- retained better at comprehension than knowledge category of objectives.
- retained better at knowledge than application category of objectives.
- retained better at comprehension than application category of objectives.

• Low intelligence students
- retained better at knowledge than comprehension category of objectives.
- retained better at knowledge than application category of objectives.
- retained better at comprehension than application category of objectives.

• At knowledge categories of objective
- high intelligence students retained better than average intelligence students.
- average intelligence students retained comparable.

• At comprehension category of objectives high intelligence students retained better than average intelligence students.
- average intelligence students retained better than low intelligence students.

• At application category of objective
- high intelligence students retained better than average intelligence students.
- average and low students retained comparable.
- Treatment, intelligence and categories of objectives did not interacted, with one another.

**Finding Pertaining to study habits**

- There was a difference in the study habits exhibited by students taught by different instructional treatments.
- Students taught by post graphic organizer instruction exhibited better study habits as compared to those taught by pre graphic organizer instruction.
- Students taught by pre graphic organizer instruction exhibited better study habits as compared to those taught by traditional instruction.
- Students taught by post graphic organizer instruction exhibited better study habits as compared to those taught by traditional instruction.
- There was a difference in study habits exhibited by students of different intelligence groups.
- High intelligence group exhibited study habits better than average intelligence group.
- High intelligence group exhibited study habits better than low intelligence group.
- Average intelligence group exhibited study habits better than low intelligence group.
- Treatment and intelligence interacted with each other.
- High intelligence students
  - taught by pre graphic organizer instruction and post graphic organizer instruction yielded comparable study habits scores.
  - taught by pre graphic organizer instruction and post graphic organizer instruction exhibited better study habits than those taught by traditional instruction.
  - taught by post graphic organizer instruction exhibited better study habits than those taught by traditional instruction.
• Average intelligence students
  - taught by pre graphic organizer instruction and post graphic organizer instruction exhibited post comparable study habits.
  - taught by pre graphic organizer instruction exhibited better study habits than traditional instruction.
  - taught by post graphic organizer instruction exhibited better study habits than traditional instruction.

• Low intelligence students
  - taught by pre graphic organizer instruction and post graphic organizer instruction exhibited comparable study habits.
  - taught by pre graphic organizer instruction exhibited better study habits than those taught by traditional instruction.
  - taught by post graphic organizer instruction exhibited better study habits than those taught by traditional instruction.

• When taught by pre graphic organizer instruction
  - high intelligence students exhibited better study habits than average intelligence students.
  - high intelligence students exhibited better study habits than low intelligence students.
  - average intelligence students exhibited better study habits than low intelligence students.

• When taught by post graphic organizer instruction
  - high intelligence students exhibited better study habits than average intelligence students.
  - high intelligence students exhibited better study habits than low intelligence students.
  - average intelligence students exhibited better study habits than low intelligence students.
6.12 EDUCATIONAL IMPLICATIONS

The present study has revealed that instructional treatment has an impact upon learning outcomes of students. Students taught social studies by graphic organizer instruction attained and retained better than those taught by traditional instruction. Further, students taught by pre graphic organizer instruction attained and retained better than those taught by post graphic organizer instruction.

Teachers should use graphic organizers for teaching graphic organizers are useful thinking tools that allow students to organize information and allow students see their thinks. They are spatial, logical/mathematical tools that appeal to many learners for managing and organizing information. Graphic organizers give visual representation of facts/concepts and also they show the relationship between and among new facts and previous information. They can also be used to plot processes and procedures. Graphic organizers can be used at many points in the lesson.

The difference between food and poor learners is not the sheer quantity of what the good learner learns, but rather the good learner’s ability to organize and use information.

Graphic organizers can also be used:

- For brainstorming at the beginning of a lesson or unit to find out what students already know.
- With reading assignments or when watching a video so that students can organize and capture information. The teacher may provide one, or students can design that own using the criteria given by the teacher, such as who ? What ? Where and Why ?
- To help chronicle a sequence of events or a process.
- To relate new information to previously learned information.
- To check for understanding.
- For note taking and summarizing.
- For the culminating assessment.
To help students store and retrieve information presented to them.

Many students begin to design and create their own organizers to fit their needs, using visual representations often appeals to the interpersonal learner, who appropriates opportunities for processing and reflecting on new information independently.

Instructional strategies that increase student achievement are comparing, contrasting, classifying and using metaphors. Students who spend time looking at the similarities and differences between two topics and perhaps plot these on a graphic organizer upon their understanding and ability to use the knowledge. Students can compare forms of art of scientific procedures politicians historical events. Teachers should encourage students to develop graphic organizers independently.

Students of high, average and low intelligence attained and retained better when taught by graphic organizer instruction as compared to traditional instruction.

The average intelligence group perform as well as the high intelligence group. High and low intelligence students thought by pre graphic organizer instruction and post graphic organizer instruction exhibited comparable mean gain in achievement.

So, a special attention should be paid by teachers to the instructional designing for low intelligence students. Based on the present findings and previous empirical research, it is implied that instructional strategies in general and graphic organizer instruction in particular has important and diverse effects on students with diverse mental ability.

6.9 SUGGESTIONS FOR FURTHER RESEARCH

- The present study was confined to teaching social studies. Similar research can be conducted to determine effectiveness of graphic organizer instruction for teaching mathematics, language and science etc.
- A similar investigation may be conducted on different educational levels – i.e. elementary, college or university levels in different subjects.
Research may be conducted involving other important variables such as learning styles, creativity, motivation, self concept, self esteem, cognitive style, levels of aspiration etc.

The present study may be replicated on a larger population for greater validation of results.

Effectiveness of graphic organizer instruction may be researched at larger scale for learners of different age group, subject areas, self esteem, etc.

Affective and psychomotor domains need to be further explored as desired effect of teaching through these instructions.

Applications of graphic organizers to education of various disadvantaged groups, handicapped, the gifted and the like may be helpful.

Students interest or willingness of study through various graphic organizers of teaching may also be probed and their effect on motivation may also be studied in longitudinal manner.

The teacher behaviour under graphic organizers here also needs to be analysed from the transcripts of the lessons transacted using these two strategies.