CHAPTER - VII

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CHAPTER - VII

CONCLUSION AND DISCUSSION

7.1 INTRODUCTION

Joyce and Weil have done a pioneering service to the development and enrichment of teaching and learning at the school level by developing a variety of approaches to teaching, discussing their underlying theories, examining the research that has tested them, and illustrating their uses. These powerful approaches to teaching and learning, as they are called 'Models of Teaching', by Joyce and Weil, are designed to bring about particular kinds of learning and to help students become more effective learners. Models of teaching are really models of learning (Joyce, Weil & Showers, 1992). Through these models, students acquire information, ideas, skills, values, ways of thinking, and means of expressing themselves. Models of teaching are based on the major philosophical and psychological orientations towards teaching and instructions. In the absence of valid psychological principles dealing with classroom learning, teachers can adopt only two alternative procedures in searching for successful teaching practices. They can rely on the traditional prescriptions available in the educational folklore and on the precepts and examples of their own teachers and older colleagues. Or they can

attempt to discover effective techniques of teaching
through trial and error (Ausubel, 1968; Ausubel et al.,1978),
By developing models of teaching, Joyce and Weil, have brought
the philosophical and psychological principles to the four
walls of classrooms. Through models of teaching, they have
provided classroom teachers a variety of approaches to
teaching which they can use to achieve a variety of educational
objectives.

After the development of models of teaching, they
received wide popularity among the researchers and
practitioners in the field of education. Many of them worked
on these models of teaching and found that all of them work.
All of these mddels are backed by some amount of formal
research that tests their theories and their abilities to
gain effects. Some are backed by a few studies while others
have a history of literally hundreds of items of research
(Joyce, Weil & Showers, 1992).

Models of teaching became the focus of attention by
the educational researchers in India in the beginning of
the eighties. The first doctoral research on models of
teaching was carried out by Chitriv (1983). He compared the
concept Attainment Model and the Advance Organizer Model
with traditional method on the various criteria of concept
acquisition in mathematics. A number of researches at the

M.Ed and M.Phil levels followed suit at the DAVV, Indore in the mid eighties. During this time, the utility and applicability of models of teaching were made popular nation-wide by the National Council of Educational Research and Training (NCERT). The NCERT took up large scale projects at the national level to orient teachers on the line of the models at the University of Indore. Also, a few studies were taken up by the researchers to see the effectiveness of different models of teaching in terms of students' achievement in different subject areas. Similarly, a few studies were carried out to see the effectiveness of different models of teaching in the teacher training programmes. Towards the end of the eighties, research on models of teaching gained momentum through out the country. But, most of the researches were confined to the study of effectiveness of the models in terms of students' achievement in different subject areas. Very few of them addressed themselves to the examination of both instructional and nurturant effects of the model. Of course, lately, a few researchers have shown interest in the study of instructional and nurturant effects of different models of teaching.

The present investigation constitutes an attempt towards the examination of instructional and nurturant effects of Advance Organizer Model of teaching. The study aimed at achieving six major objectives. To meet these objectives,

six hypotheses were formulated by the researcher. Objectives
and hypotheses of the study are mentioned in Chapter I of
the thesis. Tests were developed to collect evidence to
examine each of the hypotheses. In order to measure the
instructional outcomes, both CRT and comprehensive testing
procedures were followed. As a result, unit tests and
comprehensive tests for both the instructional outcomes,
namely, development of conceptual structures and meaningful
assimilation of information and ideas,were developed. For
measuring nurturant outcomes, test on interest in inquiry
and test on habits of precise thinking were developed.
These tests were tried out on a different sample. The
comprehensive test on meaningful assimilation of information
and ideas was used as the retention test. A reaction scale
was also developed to measure students' reactions towards
the Advance Organizer Model of teaching. Experimentation was
carried out on a sample of 54 students of VIII class, both
boys and girls, of Kendriya Vidyalaya, No.1, Bhubaneswar.
The subject of study for the experimentation was Civics.
The design of the study was a post-test only control group
design. The design of the study required both the groups
to be matched on the variables namely, previous scholastic
achievement and intelligence. Therefore, both the groups
were matched on these variables. The experimental group was
taught by the experimental teacher on the line of the Advance
Organizer Model and the control group was taught by the

control teacher on the line of the traditional method.
Unit tests were administered to both the groups at the end
of each unit, whereas comprehensive tests and test on
interest in inquiry and test on habits of precise thinking
were administered to both the groups at the end of the
experimentation. Reaction scale was administered to the
students of experimental group only. Retention test was
administered to both the groups after a gap of 40 days.
Data collected with the help of these tools were scored by
the researcher. Means and standard deviations were computed
from the scores of students of both the groups. The t-test
of significance was applied to determine the statistical
difference between the mean scores of experimental and
control groups. Mean, standard deviation and t-test were
used to analyse the data collected from all the tools
except the reaction scale.To analyse data obtained from the
reaction scale, Chi-square test was applied. On the basis
of analysis of data, results pertaining to all the objectives
of the study were arrived at . The summary of results
with respect to six objectives are presented in the coming
section.

7.2   SUMMARY OF RESULTS

The results of the present investigation with respect
to six objectives are summarised below:

I.   There existed significant difference between the
mean scores of the experimental and the control

group in development of conceptual structures. The higher mean score of the experimental group on the unit test as well as the comprehensive test indicated that the Advance Organizer Model group was superior to traditional method group in development of conceptual structures.

II. There was significant difference between the mean scores of the experimental and the control group in meaningful assimilation of information and ideas. The higher mean score of the experimental group on the comprehensive test showed that students of experimental group were superior to those of control group in meaningful assimilation of information and ideas.

III. There existed significant difference between the mean scores of experimental and control groups in students' interest in inquiry. The higher mean score of the experimental group on the test on interest in inquiry over the control group showed that students of Advance Organizer Model group were better in comparison to students of traditional method group in interest in inquiry.

IV. There was significant difference between the mean scores of experimental and control group in students' habits of precise thinking. The higher mean score of the experimental group on the test on habits of precise thinking indicated that the students of Advance Organizer Model group were better in comparison to students of control group in habits of precise thinking.

V. There existed significant difference between the mean scores
of the experimental and the control group in students'
retention of meaningful assimilation of information and
ideas. The higher mean score of the experimental group on
the retention test indicated that students of Advance
Organizer Model group were superior to students of
traditional method group in retention of meaningful
assimilation of information and ideas.

VI. The Chi-square values for the positive items in the reaction
scale were found significant at .01 level. In these cases,
'equal answer' hypotheses were rejected. It meant that
there was significant difference among the students'
reactions falling under different categories. On the basis
of the majority responses falling under agreed category,
it was concluded that students reacted favourably towards
Advance Organizer Model. Similarly, the Chi-square values
for negative items in the scale were found significant at
both .05 and .01 levels. In these cases, also 'equal
answer' hypotheses were rejected. It meant that there was
significant difference among the students' reactions
falling under different categories. On the basis of the
majority of responses falling under disagreed category, it
was concluded that the students reacted favourably towards
Advance Organizer Model. On the whole, it was concluded
that students of experimental group reacted favourably
towards the model.

7.3 MAJOR FINDINGS OF THE STUDY

On the basis of the summary of results, the following major findings were arrived at:

I   Advance Organizer Model of teaching was found to be superior to traditional method of teaching in developing students' conceptual structures of the subject matter.

II.   Advance Organizer Model was found to be better in comparison to traditional method of teaching in facilitating students' meaningful assimilation of information and ideas.

III.   Advance Organizer Model was found to be superior to traditional method of teaching in developing students' interest in inquiry.

IV.   Advance Organizer Model was found to be better than traditional method of teaching in fostering students' habits of precise thinking.

V.   Advance Organizer Model was found to be superior to traditional method of teaching in facilitating students' retention of meaningful assimilation of information and ideas.

VI.   Students taught through Advance Organizer Model expressed favourable reactions towards the model.

7.4 DISCUSSIONS AND IMPLICATIONS

It is worthwhile to discuss the findings of the study and their implications for classroom teaching-learning activities. The discussions and implications of the findings are presented below objectivewise:

I. The first finding of the study was that advance organizer Model developed students' conceptual structures of the subject matter. According to Ausubel, there is a parallel between the way subject matter is organised and the way people organize knowledge in their minds (their cognitive structure). He also expresses the view that each of the academic disciplines has a structure of concepts (and/or propositions) that are hierarchically organised (Ausubel, 1963). That is, at the top of each discipline are a number of broad, abstract concepts that include the more concrete concepts at lower stages of organization (Joyce and Weil, 1980). Meaningful learning takes place, when well structured new learning material is related to already available learning material in the cognitive structure. If the learning material is not well structured or sequenced, it conflicts with the existing structure. As a result, no linkage is provided between the new material and the old material and the new one may not be incorporated to the cognitive structure. In the present investigation, students of experimental group were able to develop conceptual structures or concept maps in the unit tests and the comprehensive test which students of control group failed to do. This means that students of experimental group could understand the way the subject matter in the test passages was organised and accordingly organize knowledge in their cognitive structure.

The above finding has wide   ` applicability in the context of school education. Generally, teachers in our schools use the traditional method of lecturing and discussing

without the use of any scientific pedagogic techniques. Conceptual structuring or concept mapping is one such pedagogic technique which can be used to present subject matter hierarchically and scientifically. Therefore, teachers in schools should be encouraged to make use of this technique while presenting learning material. As most of the school subjects consist of concepts or propositions in a hierarchical manner, the use of concept mapping will be very useful. A discussion between the researcher and a few teachers of Kendriya Vidyalaya, No.1, Bhubaneswar, where the experiment was conducted reveals that such a technique may not develop the language power of the students in a particular subject. This may be one of the drawbacks of the technique. However, this technique has the unique potentiality to help students in retaining the learning material for a longer time. Novak and their colleagues (1981), at the Cornell University, New York, have done extensive research on the utility of this technique at the school level. Moreover, concept mapping has been used to design different courses like Earth. Science Courses (Ault, 1985) and Microbiology (Barenholz and Tamir, 1985). It has also been used in teacher education programmes and in medical education (HOZ, 1987).

Looking to the above developments outside India, steps should be taken up to design textbooks and courses using

concept mapping. Inservice teachers as well as trainee teachers should be oriented to make use of concept mapping as a technique of teaching. Students should also be encouraged to learn the subject matter using concept maps. The policy makers at the national and state levels should ensure that the benefits of research on concept mapping are made use of to improve school education.

II   The second finding of the study revealed that Advance Organizer Model facilitated meaningful assimilation of information and ideas or meaningful learning in the students. This finding is in agreement with the findings of many researches including those done by Ausubel himself. Ausubel's idea on learning centres around two major concepts. One is meaningful learning and another is rote learning. According to Ausubel, meaningful learning takes place when the new learning material is related to the meaningful learning set in the existing cognitive structure. Advance organizer plays a significant role in connecting the new learning material with the relevant learning material in the cognitive structure. When there is absence of meaningful learning material in the cognitive structure of the learner, the new material is learnt in a rote manner. Ausubel believes in the fact that learning material learnt in a meaningful way is permanent, whereas learning material learnt in a rote manner is temporary. The results of the present investigation with regard to the second objective support the belief of

Ausubel. Students of both experimental and control groups
performed equally well on unit tests on meaningful assimi-
lation of information and ideas, whereas students of
experimental group performed better than those of control
group on the comprehensive test on meaningful assimilation
of information and ideas. This implies students of traditional
method group might have done well on unit tests because of
rote learning and their failure to maintain learning on the
comprehensive test might be attributed to the loss of
learning during the experimental period as rote learning
is temporary.

The above discussion provides interesting implications
for the improvement of classroom teaching-learning in the
context of India. Students learn the subject matter in a
rote way through traditional method of teaching. Teachers,
therefore, should be encouraged to teach students the subject
matter in a meaningful way. Apart from teaching at the
knowledge level, teachers should teach at the understanding,
application and higher levels of cognitive domain. For
achieving this objective, steps should be taken to orient the
inservice teachers as well as the trainee teachers on the
line of Advance Organizer Model of teaching. The teacher
education curriculum must incorporate Advance Organizer
Model as a topic under the Models of Teaching course. Steps
may be taken to design the School textbooks on the line of
the Advance Organizer Model.

III.   The third finding of the study was that Advance Organizer Model helped in developing students' interest in inquiry or problem solving. Problem solving refers to any activity in which both the cognitive representation of prior experience and the components of a current problem situation are reorganised in order to achieve a designated objective (Ausubel et al.,1978). Hence, one's liking in problem solving requires one's prior experience in the existing cognitive structure. Ausubel admits that problem solving involves discovery learning. But he argues that problem solving is meaningful when learners nonarbitrarily and substantively relate a potentially meaningful problem setting proposition to their cognitive structure for the purpose of generating a solution. From this it is seen that all the essential elements of meaningful learning like a meaningful learning set, a logically meaningful learning task, and the availability of relevant materials in the cognitive structure are involved in problem-solving. Therefore, one's liking in problem-solving is influenced by the meaningful ideas in the cognitive structure. If a person does not have meaningful set in the cognitive structure he/she is unable to make use of the prior experience in solving the new problem. As a result, he/she may not express his/her interest in inquiry or problem solving.

In the present study, students of the experimental
group were able to score better in the test on interest
in inquiry in comparison to students of the control group.
This may be due to the fact that Advance Organizer Model
was nurturing students' interest to make use of meaningful
learning set in their cognitive structure to solve the new
problems which came on their way during the experimentation
period. This nurturing effect was utilised by the students
of experimental group to express their likings in solving
problem situations in the test on interest in inquiry.

The above finding has implications for school education.
Teachers in schools rarely make use of inquiry or problem-
solving technique in their teaching activity. As a result,
students lack interest in inquiry both inside and outside
the school. Steps should be taken to foster interest in :
inquiry by using Advance Organizer Model in teaching.
Teachers should encourage students to make use of meaningful
learning strategy to solve various curricular and co-curricular
problems. Teacher education programmes should also stress on
the inculcation of interest in inquiry among the trainee
teachers through its teacher education curriculum.

IV.   The fourth finding of the present study revealed that
Advance Organizer Model promoted students' habits of precise

thinking. Ausubel talks about acquisition of precise and integrated understanding in the context of active reception learning. Ausubel believes that meaningful learning is not a passive kind of learning. It is as active as discovery learning. In meaningful learning, before meanings are retained, they must be acquired first. The process of acquisition of meanings is necessarily active. Thus meaningful learning involves more than simple cataloging of ready-made concepts within cognitive structure. Ausubel et al. (1978) points out certain tasks that a learner does in active meaningful learning. First, the learner decides which established ideas in cognitive structure are most relatable to a new learning task. Second, he reconciles between them if there is some conflict. Third, he accomodates new propositions into a personal frame of reference in consonant with his experiential background, vocabulary, and structure of ideas. Finally, if the learner, in the course of meaningful reception learning, cannot find an acceptable basis for reconciling apparently or genuinely contradictory ideas, he or she is sometimes inspired to attempt a degree of synthesis or reorganization of his/her existing knowledge under more inclusive and broadly explanatory principles. All these tasks, on the part of the learner, depend on his/her search for integrative meaning and on the vigorousness of his self-critical faculty. According to

Ausubel (1985), a central task of pedagogy, therefore, is to develop ways of facilitating an active variety of reception learning characterized by an independent and critical approach to the understanding of subject matter. This involves, in part, the encouragement of motivations for and self-critical attitudes towards acquiring precise and integrated meanings.

Teachers, therefore, can help foster acquisition of precise meanings or precise thinking by encouraging students to recognize and challenge the assumptions underlying new propositions, to distinguish between facts and hypotheses, to distinguish between warranted and unwarranted inferences, to delineate differences and similarities between related concepts and to identify the central idea of a theme.

In the present study, students of experimental group were able to score higher in the test on habits of precise thinking in comparison to students of control group. This may be due to the fact that Advance Organizer Model was nurturing students' habits of precise thinking by utilising and integrating the above mentioned techniques into the teaching-learning process, thereby making the meaningful learning of the students more active. This nurturing effect was utilised by the students of experimental group to respond to the new learning situations provided in the test on habits

of precise thinking in a precise and integrated manner. This task was not possible with the students of control group.

The above finding has wide implications for the improvement of school education. Development of thinking power is hardly stressed in school education. Schools exist not to cram facts into the students' heads, but rather to help them acquire power in learning for themselves (Smith, 1975). Development of thinking power should be the primary task of school learning. Teachers, therefore, should adopt all such techniques which promote thinking power. The techniques of precise thinking discussed above should be adopted by the teachers while teaching different subjects. These techniques must be integrated with the school curriculum. The examination system should also aim at assessing precise thinking ability of the students in stead of confining it to the measurement of knowledge only. The teacher education programme while orienting teachers on the line of Advance Organizer Model should stress the need of precise thinking in meaningful learning activity. The policy makers should take into account the fact that development of precise thinking is a part of school curriculum. Teachers

                                                              in the learners
should also try to develop habits of precise thinking/through different curricular and co-curricular activities.

V. The fifth finding of the study was that Advance Organizer Model facilitated students to retain learning material for a longer time. Retention, according to Ausubel, refers to the

process of maintaining the availability of a replica of the
acquired new meanings, whereas forgetting represents a
decrement in availability. Thus, retention prevails between
the establishment of a meaning and its reproduction.
Retention of learning material takes place in case of meaningful
learning, but it does not occur in case of rote learning. It
is because new learning material is related to relevant,
established ideas in the cognitive structure, as a result, it
can be incorporated easily and made available whenever it is
required. The findings of many researches provide evidence to
the above fact. These have been discussed in the Chapter III.
The finding of the present investigation also shows that
students of Advance Organizer Model group were able to retain
learning material even after forty days of the experimentation
Ausubel attaches a lot of importance to the retention of
learning material. To him, only learning material learnt in a
meaningful way, be it reception learning or discovery
learning, can be retained for longer.

The above finding of the study has wide implications
for school education. Student learning in schools is generally
subject to forgetting easily. It is because most of student
learning in schools take place in a rote fashion. Therefore,
meaningful learning strategy, namely Advance Organizer Model
of teaching, should be adopted by teachers in order to help
students to maintain learning for a longer period. Short-term

and long-term examination should be conducted to assess how far students have retained learning of subject matter. On the basis of the results, teachers can improve their teaching to foster retention of learning among the students.

VI. The sixth finding of the study is that students taught through Advance Organizer Model expressed favourable reactions towards the model. The model was liked by the students because of its inherent capacity to foster meaningful learning. From this finding, it is implied that Advance Organizer Model, if adopted by teachers of Indian Schools, will be liked by students. Since, the study was conducted on one school and again on a limited sample, such a conclusion may have certain limitations. Still then, the small evidence that the present research provides has some implications for school learning.

7.5 SUGGESTIONS FOR FURTHER RESEARCH

Looking to the results obtained, findings arrived at, and the experience gained in the course of the present investigations, some suggestions regarding further research on Advance Organizer Model and in the field of models of teaching, in general, are presented below:

I. The study should be replicated on different grade levels and subject matter to examine the generalizability of conclusions drawn from the present study.

II.   The study should also be replicated on different types
       of settings like rural, urban, etc. to see the wider
       applicability of the model.

III.   Different types of schools like state managed schools,
       privately managed schools, English medium schools,
       vernacular schools, etc. may be taken for carrying out
       research on Advance Organizer Model.

IV.   Relationship between instructional and nurturant effects
       of the model with different cognitive variables like
       intelligence, creativity, etc. may be examined.

V.   Development and tryout of instructional materials on the
       line of AOM may be carried out.

VI.   Applicability of Advance Organizer Model to improve
       distance education learning material may be examined.

VII   Studies may be undertaken to develop and tryout
       teacher education curriculum on the line of Advance
       Organizer Model.

VIII   Instructional and nurturant effects of other models of
       teaching may be studied for the purpose of validation.

IX   The study can be replicated on a large sample to find
       out the generalizability of the conclusions.

X   The applicability of concept mapping technique in
       teaching different school subjects may be examined.

XI   Development and tryout of instructional material on the
       line of concept mapping may be undertaken.

7.6   CONCLUDING REMARKS

School system all over the world aims at achieving one broad objective, that is to prepare the students to face the future life and shape the world or society they live in productively. Therefore, all educational efforts are geared towards meeting this broad objective. In the words of Joyce, Weil and Showers (1992),

" Schools and classes are communities of students
brought together to explore the world and learn
how to navigate it productively. We have high
aspirations for these little units of our society.
We hope their members will become highly literate,
that they will read omnivorously and write with
skill and delicacy. We hope they will understand
their social world, be devoted to its improvement,
and develop the dignity, self-esteem, and sense of
efficacy to general personal lives of high quality.
These fundamental goals of education are central
to the study of teaching".

Models of teaching took birth to fulfil the above goals of education in the context of school learning. These are powerful approaches to teaching-learning designed to bring about particular kinds of learning and to help students become more effective learners. Therefore, models of teaching provide a number of alternatives which the teachers in

the schools may follow to improve their teaching as well
       to
as/achieve   the objectives of teaching. Models of
teaching, developed by Joyce and Weil (1972, 1980), are
theoretical description of various approaches to teaching.
An examination of the validation of these models in the
content of school teaching is badly necessary. Hence, the
research on models of teaching comes into the picture.
Research on models of teaching in India is at its developing
stage. Of late, it is taking the shape of a movement in the
field of educational research. The present research consti-
tutes a part of the movement called, 'Research on Models of
Teaching'. It examined the instructional and nurturant effects
of Advance Organizer Model. The research came out with
interesting findings and validated the model in terms of its
instructional and nurturant effects. The findings of the
present research have tremendous implications for the improve-
ment of teaching-learning at the school level. These have
already been discussed in the present Chapter. In the
conclusion, the researcher hopes that the findings of the
study are made use of by the practitioners in the field of
education and the policy makers at the national and state
levels.