CHAPTER VI
```
         *
         *
         *
         *
 *  *  *  *  *  *   REVIEW, DISCUSSION OF RESULTS
                    AND SUGGESTIONS
```

==

6.1.0 Introduction

6.2.0 Objectives of the Study

6.3.0 Hypotheses of the study

6.4.0 Methodology

6.5.0 Sample

6.6.0 Integration Stratagey

6.7.0 Tools

6.8.0 Analysis of Data

6.9.0 Main Findings

6.10.0 Discussion

6.11.0 Implications

6.12.0 Suggestions for Future Studies

==

6.1.0 Introduction

The present investigation entitled 'Development of A Stratagey for Integration of Teaching Skills in Teacher Training', can be viewed as consisting of two distinct parts, which are complimentary in nature. The first part, which was developmental in nature, dealt with the development of tools and the instructional material for the study, while second was an experimentation. In a broadsense, the research efforts in the present investigation were directed towards :

(i) developing an integration stratagey for the integration of teaching skills, at B.Ed. level,and

(ii) establishing the effectiveness of the developed stratagey in terms of classroom teaching performance.

Another research interest of the present study was to investigate the relative influence of independent variables namely, qualifications, teaching experience, academic merit, skill comprehension achievement, availability of study time, attitude towards teaching and attitude towards microteaching, on developing integration ability by the integration stratagey evolved.

Taking into account, the need to define the term integration and crystalise the meaning, various view points were refered in through review of literature available. The integration is defined as -

'Integration is the ability of applying the conditioned behaviour from a microteaching setting to the real class room setting for achievement of the objectives set for teaching.'

Further, the review was done to theorise the integration model so as to form a basic structure on which structured integration stratagey can be built upon. On the basis of behaviouristic approach, the analysis of microteaching programmes and integration studies provided a theoretical structure for microteaching and integration. The theoretical descriptive model evolved, presented the specific tasks that are to be provided to the teacher trainee for integration. The specificity of tasks and conceptual clarity decided the basic term of reference for testing the validity of the stratagey.

6.2.0 Objectives of the Study

The study aimed at fulfilling the following objectives :

1. To develop an integration stratagey, alongwith software material, mode of presentation and conditions of training for integrating the teaching skills acquired through microteaching practice.

2. To establish the effectiveness of the integration stratagey in terms of :
    (a) Content Validity
    (b) Teacher trainees performance in class room teaching for integration, and
    (c) Teacher trainee's reactions towards integration stratagey.

3. To study the relative effectiveness of integration
   stratagey for integrating the teaching skills on
   variables, qualification, teaching experience, academic
   merit, skill comprehension achievement, availability
   of study time, attitude towards teaching and attitude
   towards microteaching independently in terms of teacher
   trainees integration performance in class room teaching
   measured through :

   (a) Skill interaction analysis category system
   (b) General teaching competency scale, and
   (c) Teaching effectiveness comprehension scale.

6.3.0 Hypotheses of the Study

Based on the logical analysis of relationship and review
of researches, the following hypotheses were formed and
subsequently tested :

1. There will be no significant difference between the
   pre and post ability of integration of teaching skills
   of teacher trainees measured in terms of -

   (a) Skill interaction analysis category system,
   (b) General teaching competency, and
   (c) Teaching effectiveness comprehension.

2. Student teacher's reactions on various components of
   integration stratagey in terms of their presentation,
   and usefulness will be equivocal.

3. The two sub-groups formed namely, group having below
   average scores on attitude towards teaching, and above
   average scores on attitude towards teaching will not
   differ relatively in integration of skills from pre test
   to post test when measured in terms of -

(a) Skill interaction analysis category system,

(b) General teaching comprehension, and

(c) Teaching effectiveness comprehension.

4. The two sub-groups formed namely, group having free availability of study time and group having no free availability of study time will not differ relatively in integration of skills from pre test to post test when measured in terms of criterion as mentioned in hypothesis Number 3.

5. The two sub-groups formed namely, group having teaching experience and group having no teaching experience will not differ relatively in integration of skills from pre test to post test when measured in terms criterion as mentioned in hypothesis Number 3.

6. The two sub-groups formed namely, group having high achievement as skill comprehension test and group having low achievement on skill comprehension test will not differ relatively in integration of skills from pre test to post test when measured in terms of criterion as mentioned in Hypothesis Number 3.

7. The two sub-groups formed namely, group having post-graduate qualification and group having only graduate qualification will not differ relatively in integration of skills from pre test to post test when measured in terms of criterion as mentioned in hypothesis Number 3.

8. The two sub-groups formed namely, group having high academic achievement in their previous collegiate career and group having low academic achievement will not differ relatigely in integration of skills from pre test to post test when measured in terms of criterion as mentioned in hypothesis number 3.

9. The two sub-groups formed namely, group having - above average scores on attitude towards microteaching and groups having below average scores will not differ relatively in integration of skills from pre test to post test when measured in terms of criterion as mentioned in hypothesis number 3.

6.4.0 Methodology of the Study

A pre test - post test single group design is used to find the effectiveness of the stratagey, the procedure followed has been schematically presented hereunder :

Phase 1 : Purposive sampling. (N = 13)
Student teachers having science as the first method and physics, chemistry, biology or mathematics as the second method, with English as practice teaching medium.

Phase 2 : General Treatment :
Practice teaching ... through Indian Standard Model of Microteaching for seven skills namely, skill of writing objectives, skill of probing questioning, skill of explaining, skill of illustrating with examples, skill of inf reinforcement, skill of stimulus variation and skill of blackboard work.

Phase 3 : (A) Pre test :
Observation of two lessons of real class room teaching performance with :
(a) Baroda General Teaching Competence Scale
(b) Teaching Effectiveness Comprehension Scale
(c) Skill interaction analysis category system

(B) Independent Variable Measurement with
(1) Skill Comprehension Paper Pencil Test
(2) Ahluwalia's Teaching Attitude Inventory
(3) Attitude towards microteaching Rating Scale
(4) General Information Sheet

Phase 4 :   Experimental Treatment :

Experimental treatment includes integration practice, which has instructional material, instructional techniques like discussion, lecture, simulated practice, class room practice, and field work as stratagey components. The stratagey has following units as the content component.

Unit 1 : Use of Questioning and Explaining in class room Teaching.

Unit 2 : Use of Blackboard in Class Room Teaching

Unit 3 : Use of Visual media in Class Room Teaching

Unit 4 : Reinforcement Personalisation

Unit 5 : Inquiry Approach as a Method of Teaching

Unit 6 : Variables influencing Class Room Teaching

Unit 7 : Diagnostic and Remedial Practice for Class Room Teaching

Unit 8 : Co-curricular activity organisations related to classroom teaching.

Phase 5 :   Post test (i) Observation of two lessons in real class room conditions for teaching performance with the tools as mentioned for pre testing.

(ii) Student teacher's reactions on different components of stratagey.

Phase 6 :   Analysis of Data

6.5.0 Sample for the Study

Thirteen student teachers of the Faculty of Education and Psychology, M.S. University of Baroda for the year 1980-81 formed the experimental group. The group was a purposive sample. All the thirteen student teachers had opted their first method of teaching as science and second method of teaching, one amongst the four namely, Physics, Chemistry, Biology and Mathematics, as required. The medium of practice teaching was English. The group was

heterogeneous on variables namely, sex, age, merital status, qualifications, and teaching experience.

Development of Integration Stratagey : The stratagey development consists of deciding over the type of experiences to be provided, their mode of presentation techniques involved and·sequencing of experiences. The scientific steps involved in the development of strategey and software are as follow :

1. Identification of general objectives

2. Preparation of content outline

3. Listing the terminal behaviour

4. Selection of method and media for attaining terminal behaviour

5. Development of software material

6. Establishing the content validity and appropriaateness of language and style of presentation, and

7. Laboratory try out.

6.6.0. Integration Stratagey

The complete stratagey consists of eight units. The first unit is on formation of sequence of experience for class room teaching, framing main questions and explanation phases. The first unit is presented in the form of instructional material, demonstration and exercises. The exercises are of three different types. Each exercise is taken at a time for discussion, practice and feed back.

The second unit deals with blackboard work management and use along with other teaching skills. This had practice in simulation along with discussion.

The third unit deals with use of stimulus variation and its integration. The components of this unit are instructional material, discussion and practice. The emphasis in this unit is to use the teaching skills along with models, charts and maps. The exercise component was carried out in science laboratory conditions along with necessary visual materials.

The fourth unit deals with individualisation of skill of reinforcement. This unit has instructional material, discussion, practice and feedback. In this unit every student teacher's reportiore of reinforcers were discussed in relation to her personality and suitability.

The fifth unit is to provide approaches for teaching. The student teachers were from science discipline, and therefore inquiry approach was selected for the planning, discussion and practice as the basic method.

The sixth unit had the objective of sensitising student teachers to class room variables affect teaching pattern, wherein controlled real class room teaching was the major input.

The seventh and eighth units were remedial and diagnosting practice teaching, and acquaintance with co-curricular activities related to science teaching. The remedial diagnostic teaching was to provide individualised guidance depending upon the student teachers' need and personalities. The co-curricular exercises were to help them to relate the classroom teaching activities to the co-curricular activities of school.

6.7.0 Tools for the Study

(A) Tools Developed :

(1) Skill Interaction Analysis Category System : This is a tool similar in methodology to Flanders Interaction Analysis System in operation, this differs from FIACS in terms of categories. The tool has ten categories which are skill components. The tool is useful to record the class room interaction in terms of skill interactions. The tool is developed with content validity and has interobserver reliability, when observed in classroom teaching sessions.

(ii) Teaching Effectiveness Comprehension Scale : This is rating scale having six dimensions of teaching as their components. Each component is graded on seven point scale ranging from not at all to very much in their effectiveness during the teaching. This tool do not take skills and their components in observation directly to measure teaching effectiveness, but considers teaching dimension in a gestaltic form.

(iii) Skill Comprehension Achievement Test : This is a paper-pencil test prepared to test the comprehension of student teachers on teaching skills and their use in class room. The test includes seven skills under study. The content coverage is achieved by preparing a blue print so as to cover all skills and components. The test has all objective type items under eight main questions.

(iv) Interview Questionnaire for Student Teachers : This
is a set of sequential questions structured for taking
reactions of student teachers regarding integration
stratagey. The questions were prepared by the help of a
blue print which included all components of stratagey. The
questions are divided into two sections. Part A deals with
simulated training having five sub sections and part B deals
with school practice training having five sub-sections.

(v) Student Teacher General Information Sheet : This
sheet inquired information regarding their academic and
professional growth since from secondary education stage,
their age, sex, merital status, teaching experience, proficiency
in English language, present service conditions etc. The
sheet was of fill in the gap type.

Use of Ready Made Tools

(i) Baroda General Teaching Competence Scale : This tool
is prepared by Passi et al. (1971). The scale has both
content and factorial validity (Rama, 1980), with inter-
observer reliability 0.85 to 0.91 (Passi and Lalitha, 1979).
The scale has 21 items based on the teaching skill components.
Each component is to be rated on the seven point scale ranging
from not at all (0), to very much (7) on their effectiveness.

(ii) Ahluwalia's Teacher Attitude Inventory : This
inventory is prepared by Ahluwalia et al. (1970). The inventory
is a 90 item Likert instrument consisting of six sub classes with

as many as 150 items. Each item is to be rated on four point
scale from strongly agree to strongly disagree by the
respondent. The split-half reliability of the tool is 0.65
(N = 239). The tool has high test re-test reliability.

(iii) <u>Attitude Toward Microteaching - A Rating Scale</u> : This
scale is prepared by Passi et al. (1976). The scale has 32
items on different inputs of microteaching programme. Each item
has to be rated on five point scale by respondent. The scale
has been tried and found useful during first and second
national level microteaching project conducted by NCERT (1976,
1978).

6.8.0 Analysis of the Data

The experimentation and data collection is as presented
in the design of the study. The data is analysed objectivewise.
For objective on the establishing the validity of stratagey,
group analysis was carried on. Each tool measurements were
first analysed and tabulated independently. The final analysis
obtained was in terms of skill interaction pattern data,
integration indicators, group means, S.D., for pre test and
post test. The data was further tested to find the results. For
the second objective the experimental group was divided into
two sub-groups on variable under the study. Each sub-group
data were analysed to get the sub-group based interaction
pattern, integration indicators and ANCOVA of the two sub-groups
with post test means adjusted on the pre test means. The system

of analysis was repeated seven times for seven variables each one taken at a time.

6.9.0 Findings of the Study

1. The developed integration stratagey produced significant difference between the pre test and post test performance in terms of interaction patterns, highly positive integration indicators indicating integration of skills, significant difference of mean on general teaching competence and significant difference of means on comprehensive teaching effectiveness. The data in the form of students reactions was highly favourable regarding effectiveness of different stratagey components.

2. All the seven variables namely, qualifications, teaching experience, free availability of study time, academic merit in the previous career, test scores on skill comprehension, attitude towards microteaching programme and attitude towards teaching show influence in developing unique type of interaction patterns distinct from one another.

3. The sub-group having free availability of study time were able to produce superior interaction patterns and high integration compared to sub-group having no free availability of time.

4. The sub-group graduattes. were able to produce superior interaction patterns and high integration compared to sub-group having post graduate students.

5. The sub-group having above average scores on skill comprehension test were able to produce superior interaction patterns and high integration compared to sub-group having below average scores on skill comprehension test.

6. The sub-group having above average scores on attitude towards microteaching produce significantly higher scores on general teaching competence compared to the sub-group having below average scores.

7. The two sub-groups formed on the basis of variables namely attitude towards teaching, teaching experience did not produce any significant difference in integration indicators indicating no significant influence.

8. The two sub-groups formed on the basis of variable skill comprehension and attitude towards microteaching did produce difference on integration indicators.

6.10.0 Discussion

The experimentation was to validate the integration stratagey developed. The result indicate the effectiveness of the stratagey. They show that, student teachers trained through the stratagey after the practice of skills through microteaching show significantly high ability to integrate and develop effective teaching patterns. They also show high rating on the general teaching competence and teaching effectiveness compared to their ratings before undergoing integration practice. The group also show positive reactions towards the stratagey components.

These results are in tune with the general findings of Malhotra et al. (1979), Das et al. (1982), Belliappa A. (1975), and Nasreen Begum (1978) who found planned integration contributes significantly for integration. In all these studies rating scales for observation of teaching performance were used. The rating scales are, 'General teaching competence' and 'Indore Teaching Appraisal Scale'. These results are based on the rating on these

two scales. In these studies the sample size was less than fifteen subjects. The results on rating scale for a group of fifteen students are having some limitations. The errors due to low inter-observer reliability, small number of observations, emphasis on the item ratings on norm-ference rather than on contextual performance of teacher, in/equality of inter item weightage, psychological conditioning of supervisor to rate high as the student-teacher progressively appears towards the end of his course, weaken the measurements. In the present study though two ratings scales namely, 'General Teaching Competence' and 'Teaching Effectiveness Comprehension' are used, they are of only supportive in nature. The primary tool used was 'interaction Analysis category System'. This rating scale has been prepared keeping into consideration the needs of the study. The tool has high dependence on the recording of skill components occurance and sequence. This reduces the errors due to observer to a great extent. The purpose of the study being integration of teaching skills, the tool will directly indicate the interaction pattern of teaching skills. The recorded category sequence were used in computing the integration indicators namely 'skill association', 'skill shift', and 'skill dispersion' which indicate the ability of the student teachers to integrate the teaching skills.

Considering the tools used in the present study compared to the previous studies, the data collected and results obtained are of additional information providing deeper insight into the

problems of integration. The results presented in the form of interaction pattern and integration indicators make this feature evident. To sight a few significant interaction patterns formed by this stratagey are characterised by the increase in discussion oriented class room - interaction than prolonged lecturing with interceptive questions, use of explaining and questioning skills, shift from explaining skill to any other skills, as well as from any skill to explaining, high skill association between explaining and blackboard, high skill dispersion for explaining skill and increased use of blackboard. The integration indicators with reference to skill of questioning, explaining, blackboard, student response showed significantly positive results. At the same time the interaction makes it evident that the student teacher had to spend significant time in class room management problems.

Reactions of student teachers were another significant data collected after the experimentation. This data was also effectively used in validating the stratagey. This methodology in teacher training research should be considered as another added dimension, which is not observable in previous integration studies. The reactions are able to provide insight into the components of stratagey. Student teachers reactions stating, effectiveness of explanation and questioning exercises, appropriateness of inputs for integration of skills of reinforcement, demanding inputs for class room management, opening to simplify the exercises on enquiry

approach and their greater liking to media integration are few of the significant findings.

The specific need of integration stratagey for effective implementation of microteaching programme in Indian context, is one of the basic reason that necessitated this study. Observing the different types of treatments provided and their results in the previous studies, the present study differs significantly. Das et al. (1982) tried out four models namely, no integration, summative, additive and diode models. The results remain equivocal. Out of the six studies of the project, two showed superiority of summative model over no integration treatment group. For additive model results for two out of three remained significant when compared with no integration group means. For diode model the only experiment done did not show any significant difference with control group having no integration treatment. Joshi and Kumar (1983) found that summative is superior to additive model of integration. Lalitha (1980) found that additive and vicarious were equally effective. Similar were the results of a study by Mukhopadhya et al. (1982).

All the above referred resuits reveal that the need for a critical study of integration. The analysis of detailed reports provide some of the clues for the fluidity of results. These models though named and described in terms of skill sequencing for practice during the integration, they do not provide the details of stratagey in terms of content, exercise, media, to be applied. During the practice teaching, numerous other variables

are involved which are to be well defined. The stratagey

cannot be in its complete form unless it control all

determinant variables under study by structure$_\wedge^d$ material and

treatment model. Some of the possible weaknesses . that

might have led to the inconclusive results in these studies are

as follows: (i) The models did not provide any structured

material, the exact model of teaching, the theoretical and

practical aspects of integration skill, the structure and

content to be used during exercises, the criteria for observa-

tion of teaching exercises and feedback. (ii) The model did

not insist on integration of skills along with methods of

teaching, their relation with subject content and objectives

of lesson. (iii) The model depended completely on rating of

behaviours during teaching observation, which limited the scope

for feedback to a summative index than to provide qualitative

feedback on development of content and related use of skills

and their qualitative aspects of teaching. (iv) The conceptual

frame work and mechanism of integration were not concretised

and explained in terms of learning principles.

The present model has a highly structured software in the

form of student teachers manual, supervisors manual alongwith

course outline, terminal behaviour flow chart, specific exercises,

mode of feedback etc. The stratagies is based on implications

derived after theoretical analysis of problems related to

integration. The stratagey is evolved by following the scientific

method and systems approach rather than propose a mechanistic

skill linking practice under simulated conditions. The
stratagey also included a few essential inputs which did not
have any direct bearing on any particular skill but essential
like methods of teaching, media use and activities related
to subject-teaching. By evolving such a structured stratagey
the study allows the further reproducibility   of programme
to ascertain its validity. The four criterion measures used
provide both qualitative and descriptive appraisal of stratagey
as discussed earlier.

All most all the studies reviewed in chapter two,
(Das et al., 1982; Joshi and Kumar, 1983; Lalitha, 1950,
Mukhopadhyay et al., 1982) have used maatched group design.
Out of these except Joshi and Kumar (1983) have used vicarious
integration treatment for control group, and the experimental
group was exposed to one of the models as mentioned earlier.
All the studies have repeatedly confirmed that the planned
integration is superior to vicarious stratagey. This initiated,
in the present study no to go for the control group, and
emphasize to involve a single treatment that is well defined
and acceptable. The study did not attempt to accept any of
the model previously evolved as comparative stratagey to
validate the present one. The fluidity of the model as mentioned
earlier was the basic reason behind this decision. Due to non-
availability of equally structured and comparable stratagey,
the present stratagey opted the single group treatment design.
This design did not become weakness for the study but helped

to concentrate more on evolving sophisticated stratagey
with large amount of data for validation.

All the studies presented on integration presume.
treatment as subject free, in the sense the treatment
remains unchanged for all the subject teachers. Similar
is the standpoint during microteaching exercise as well.
The present study deviate from this standpoint. Somfar as
microteaching is concerned the practice did not presume
the subject freeness, sinc e the content of training and
criteria of measurement were limited to communication
methodology. And also, peers being learners, learning
was not hardly taken into consideration. During integration,
one cannot neglect the objectives of teaching. During this
stage the teacher does not remain as sole centre of class
but achievement of objectives is emphasized. This takes
teacher as a systemist apart from being a system component
of teaching-learning system.studies by Bruner (1966),
Erikson (1950), Maslow (1962), Piaget (1952) and many more
have repeatedly shown that there exist a relation between
the structure of knowledge and the mode of presentation
to learner. It is also evident from the evolution of
different disciplines that all subjects do not have identicle
structure of knowledge. For instance the development of
language and the development of science are sufficiently
different to the extent that they are structurally different.

All this is to say that every discipline has its own inherent structure and correspondingly suitable methodology to teach. But these methodology are by no means antithetical or mutually exclusive. The implication being that, any prescription for a methodology should take into cogniscence the content and the objectives of teaching. Depending upon these student teacher evolves an integration pattern. The present study has inputs in this regard and the software and mode of presentation are limited to science teacher training. However, the stratagey provides enough opening to modify and generate similar software for different subject-teachers training integration stratagey preparation.

The integration studies have mentioned the sample nature in terms of pre-service/in-service, arts/science/commerce, and secondary/Primary/polytechnic teachers. The results show influence of the discipline in developing skill competencies and integration. B.O.Smith (1971) in his review of researches on teacher education present antefedents or demographic variables related to student achievement and class room teaching. Out of nine studies mentioned for the variable teaching experience, seven show positive relationship with student achievement. Out of five studies on 'teacher knowledge' two show consistant and significant results. Out of four studies on teacher's attitude towards subjects also show high positive relations. The single study on achievement of student teachers did, not show any

relation with learners achievement. All these studies indicate a fair possibility of many independent variables interacting along with the stratagey in developing teaching patterns thereby influencing learner's achievement.

In the present study seven such variables were under study. The variables are attitude towards class room teaching, attitude towards microteaching, teaching experience, student teacher's achievement during his previous years, free availability of study time, qualifications in tårms of graduate and post-graduate, and skill comprehension achievement. All the variables show their influence on formation of teaching patterns. Out of seven variables three variables namely, free availability of study time, high attitude towards teaching and fresh graduate show directional relationship. These sub-group showed superior teaching pattern to their counter parts. These results are in line with the above refered studies so far as variable teaching experience, attitude, achievement of student teachers, teacher's knowledge are concerned, to furtherance the studies concentrating on these variables.

6.11.0 Implications

The basic aim of present study was to evolve an integration stratagey and establish its validity. As presented in the Chapter I, the study eventhough contributes to theorisation on integration, was evolved to provide a training stratagey for integration of teaching skills. During past

The stratagey is preceded by the microteaching programme. This could have been a stratagey integrated with microteaching programme from first phase itself. Such an attempt is deliberately avoided with a purpose not to modify the present Indian Microteaching Model which is the result of large amount of research. Moreover large number of Indian teacher educators have already adopted the microteaching model. Any substantial change in the adopted model may create resistance in acceptance of evolved stratagey.

During the experimental validation, a sample of thirteen students were involved along with a supervisor. It may be noted that in Indian Teacher Education Courses usually each supervisor is attached with ten to fifteen student teachers for practice teaching. The group size of thirteen involved in the present study has taken into account the organisational feasibility to facilitate for adoption.

In the stratagey one of the components emphasises use of appropriate teaching methods for integration of skills and integration. The present study being focussed on science teacher education, the component limits the use of stratagey to science teacher training. However the stratagey has this component as an independent phase in the total programme. This part can be replaced by suitable methodology and exercises related to other disciplines namely, social science and languages.

The study strongly favours to grouping students according to their methods of teachings namely, life and physical sciences,

social sciences, languages and fine arts. Such grouping will provide greater facility for group interaction and group activities throughout their training course. The inputs of present stratagey are arrived at considering the group consisting only of science student teachers.

The investigation of the influence of independent variable on integration reveals that, student teachers do not develop only one type of teaching pattern but the patterns vary depending upon their personality, teaching experience, qualifications, attitudes etc. This is to imply that during integration practice teaching 'master the model' may not be effective. Another interesting finding is that, the developed teaching patterns need not necessarily show superiority of one pattern over the other. A pattern formed by a student teacher should be examined contextualy specific to the student teacher and its effectiveness in class rooms, than to compare with the general models.

6.12.0 Suggestions for Future Studies

Any research opens up new vistas and new areas of research, most probably more than it answers. Due to the limitations in terms of the scope of the present study, several related questions remained unanswered. Many questions were also raised, during one or the other stage of the present investigation, for which answers are yet to be given. Such questions or hypotheses have been listed here under. Probably, they might act as guidelines for the future research attempts in this area.

1. The theoretical frame work presented in the study can be further refined and emperically tested with greater rigour. In the present study the theoretical frame remains as proposition, the implications are being used in developing training stratagey rather than to validate the theoretical model. Fundamental research in this regard so as to generate a theory through research will increase the scope of developing sound systems of student-teacher training.

2. The present integration stratagey is validated with interaction category system and rating scales. This can be further extended to validate using learners performance as a criteria. This will provide additional information to further strengthen the evolved stratagey.

3. The present stratagey has software material in the English language, which limits use of stratagey to only English medium institutions. Translation of the software into regional languages and subsequent validation will increase the scope for adoption of stratagey.

4. The stratagey evolved can be comparatively studied with other stratagey that can be evolved on the other basic models of integration. Such studies will provide new insights in refining inputs for integration and to generate new stratagies for the teacher training.

5. The present stratagey has been developed for science teacher training. One of the phases has inputs special to science teacher training. This has limited the scope of present stratagey for training science method . By preparing additional software considering different subject teachers and replacing the unit on science teacher will increase the scope for application of stratagey for other subjects.

6. During last one decade, Indian teacher education is fastly changing with the availability of variety of hardwares namely, audio-recording, video-recording facilities, preparation of slides aided with commentary and use of micro-processors for computer assisted and managed training changing the software suitably to use the hardwaresa and increase the potential will farther increase the scope to use the integration stratagey by advanced teacher education institutions.

7. The stratagey is limited to developing integration abilities among pre service teacher trainees. To facilitate its use in inservice teacher education, four year integrated teacher education courses and primary teacher education courses, suitable changes can be incorporated and validated. Similarly, the inputs can be critically studied and used for preparation of self instruction oriented teacher training models.

8. Since the Indian microteaching model has been standardised and adopted widely by large number of institutes during the present study, integration stratagey was designed as post microteaching phase. However, there is great scope to consider this problem of integration along with the micro teaching and evolve a comprehensive integrated approach for training teachers. This can also consider structuring of the complete course along with theory and practical components of teacher education curriculum.