C H A P T E R IV

DEVELOPMENT OF STRATEGIES

4.0 INTRODUCTION

This chapter presents the details of objective-3 where the procedure of development and tryout of the instructional strategies as stated under objective-3 has been reported. The objective reads as follows :

To develop and tryout instructional strategies for effective utilization of SBP by :

(a) developing instructional materials such as visuals and supporting work books to be used during the broadcast,

(b) developing instructional activities like discussions, team-teaching, guest talks, role playing, quizzes, field trips etc. for pre-broadcast, broadcast and post-broadcast activities, and

(c) integrating the elements described in (a) & (b) above with SBP.

4.1 ON INSTRUCTIONAL STRATEGY

Any instructional situation requires selection of activities for teachers and learners that are likely to promote the attainment of the instructional objectives. Mere selection of activities may not enable the system to lead to the goal. What is essential is organizing and conducting activities which appear to be suited for that instructional situation. To get the best out of the situation, the permutations and combinations of the activities are to be kept in mind while selecting them. On the other hand, an instructional strategy aiming at the achievement of instructional objectives is very much essential. An efficient instructional strategy would not only maximise student learning but improve the efficiency of the teacher and reduce his task.

In an instructional process, both, equipment based on principles of physical sciences, and instructional techniques evolved from principles of behavioural sciences, are used. When the process is looked into deeply, it becomes evident that the involvement of the various equipment and techniques is very much essential. For understanding and controlling an instructional process it is not enough to study the use of equipment and techniques in isolation, they have to be considered in a total system aimed at the realization of instructional objectives.

4.2 INSTRUCTIONAL STRATEGY FOR THE PRESENT STUDY

School broadcast programme being an instructional situation, involves men and materials which again requires continuous interaction with the learner for getting the optimum learning outcome. The medium used, namely radio, has the limitation of carrying message in a process which is one way in nature. It does not possess the built-in mechanism of interaction. It is also difficult to provide the mechanism of interaction in a less sophisticated manner so that the listeners can ask questions and get the answer. To overcome this difficulty, certain on-the-spot inputs have to be provided for creating interactional situations. Hence, organization of certain instructional activities for effective utilization of SBP is called for. For organizing meaningful activities, the presence of some additional instructional materials are also needed. The instructional activities as well as the instructional materials are to be connected in various ways to evolve an instructional strategy depending upon the nature of content.

Learners at the secondary education level may be at the formative stage in respect of their language comprehension and the development of other mental abilities. They are to be motivated to learn by arousing their interest and bringing novelty in the instruction. Modern instructional techniques

like role playing, field trips, team teaching, quizzes, guest talks suitably designed may provide them the motivation and may influence their learning outcome. Optimum learning can be attained by properly organizing and connecting the various instructional components to the medium being used. To achieve the goals of instruction the totality of the instructional situation has to be organized including the evaluation procedures.

In the instructional situation of the SBP, the totality of the situation can be taken care of by strengthening the components included in it. As mentioned in Chapter I, emphasis has to be given to make the radio instruction programme systematic by having three components namely pre-broadcast, broadcast and post-broadcast activities in sequence for the instructional strategy. In this connection, the findings of the study of objectives 1 and 2, presented in previous chapters show that organization of pre-broadcast, broadcast and post-broadcast activities to supplement the radio instruction programme are very much desired by the students, teachers, experts and administrators. So it calls for meaningful connection of the sub-components in each of these main components which may give additional support in increasing the efficiency of the instructional strategy.

To make this attempt successful in connection with the effective utilization of SBP, first, experiments at the transmitting end are to be conducted to see the effectiveness of different strategies in different situations like urban and rural schools. Because, the urban students might be coming across different sophisticated equipment and materials, modern techniques of teaching, better physical facilities, their perception as well as acceptance of SBP may differ from that of the rural children. So there may be a variation in getting benefit of SBP among rural and urban students. Taking this into consideration it has to be seen whether there is any need for developing special types of programmes for each of them. By conducting experiments, decisions can be taken for evolving school broadcast programmes, and developing strategies for their effective utilization in the schools.

Considering the above view points an attempt was made to develop an instructional strategy for effective utilization of SBP in real classroom situation and study its effectiveness in both urban and rural settings. The main components of the instructional strategy as discussed earlier were kept as pre-broadcast, broadcast and post-broadcast activities. The purposes behind these three components were respectively to bring a mental set in the learners before listening to the programmes, to sustain the interest and attention while listening and finally to assimilate the contents broadcast in the post-listening session.

4.2.1 Pre-Broadcast Activities

Keeping in view the main purpose of the development of strategies for this study clear cut objectives of the pre-broadcast session and the means to attain those objectives were thought out. The objectives are given below :

1. To link the previous knowledge of the students with the teaching to be done through the SBP.

2. To create readiness by arousing interest and curiosity in the students to learn the topic to be presented.

The means to attain these objectives, which may be called the sub-components of the main strategy, were thought to be question answers, visuals, narration of anecdotes and story telling. Depending upon the nature of the topic, content and the form of broadcast, instructional activities were to be selected from among these components and meaningfully organized to achieve the objectives of pre-broadcast session.

4.2.2 Activities During the Broadcast

Likewise the following were the objectives for the activities during broadcast :

(i) To ensure that the pupils follow the sequence of the contents.

(ii) To ensure the comprehension of the topic by engaging the pupils in writing the main points coming through the broadcast.

This being the most important stage of student learning through the SBP the activities were to be planned very carefully to attain the said objectives. Radio-vision, work-book and note-taking were thought to be appropriate components of this session. Radio-vision means the simultaneous use of radio broadcast and a film strip or slides (Ball, 1974).

It is almost similar to the technique of tape-slide presentation. In this process audio signals are incorporated in the broadcast to signal when to turn to the next picture. This technique generally engages both auditory and visual sense of the learners. Research studies have shown that this technique has been useful in imparting instruction in various parts of the world. Sekerak (1963) conducted an experiment on fifth grade science students in Turkey by taking two equal groups. Tests and questionnaires were used to measure student achievements as well as teacher and parent reactions. The result indicated that Turkish children can learn from radio vision, the hypothesis (Turkish children could learn as well or better by radio-vision than other means) was upheld, and 't' tests indicated significant differences in favour of radio vision.

The research mission to the Niger Republic in March 1966 planned by Robert Lefrane shows the effectiveness of radio vision as a successful technique of instruction in teaching French and giving training on literacy.

An experiment involving comparison of radio-vision with radio was carried out by Lever (1970) on 217 children (10-11 year age group) from Surrey, Hampshire and Berkshire schools. Through pre and post-tests it was concluded that radio and radio vision both gave significant increases on tests administered.

An experiment was conducted by Foxal (1971) by using two media, television and radio-vision in South Wales on 946 children drawn from 4th year primary and 1st year secondary schools. They were divided into television and radio-vision groups on the basis of age, sex, general mathematics ability and experience of modern mathematics. The television group watched programmes one to five of "Mathematics Today", a BBC Modern Mathematics Series, designed as a two way course. The radio-vision group used "simulated" radio vision version of these programmes, using tapes and film strips produced in University College, Cardiff by the investigator. Through questionnaire, interview, observation and tests, the experiment showed that both television and radio-vision groups achieved significant gains but no significant difference in

gains were found between the two groups due to these methods. Further, it was found that children like television and radio-vision about equally but teachers' opinion on media differed, showing that primary teachers emphatically preferred radio-vision, secondary teachers liked both media, though the pre-ponderance of opinion favoured radio-vision. Teachers indicated that flexibility in use was, to them, the biggest advantage of radio-vision. Foxal recommended that radio-vision be extended into age groups and subjects where it is not being used and into geographical areas such as the developing countries where there is a need for greater uniformity and a need to keep the educational expenditure as low as possible.

Besides these studies, radio-vision is in use in the countries like Australia, Camerons, Netherland, Kenya and France. But the investigator has not come across any study on radio-vision conducted in India. But the study (Menon, 1978) of tape-slide combination as an instructional medium for concept formation in comparison with the media 'teacher and charts' and self instructional written material, indicates that radio-vision can be used in the Indian classrooms. Menon has found the medium visual projection and taped commentary significantly more effective when compared to the media 'teacher and charts' and 'self instructional written material'. Nene (1978) used the tape-slide combination while developing a multi-media kit on Educational Technology in Gujarati

language. At present the study taken up at CASE by Krishnan to develop a multimedia kit for teaching a course on 'Audio-Visual Education' to the trainee instructors studying at Central Training Institute of Instructors has a component of tape-slide combination. Hence, considering the findings of the studies conducted, it was thought that radio-vision method would take care of both objectives (i) and (ii) cited under 4.2.2 above. It was also considered to adopt the technique of noting key points during the broadcast. Although, the A.I.R. has given instruction not to take notes during the broadcast, this is considered on the basis of teachers' reactions towards note taking by the students during listening to SBP. It has been found (Chapter III) that a majority of teachers allow their students to take notes during the broadcast. Perhaps they have found this useful for the students. For this, it was planned to train the students on "How to take notes during the broadcast". They were to be instructed to write in abbreviated form the dates, events and the names of the places which they feel to be important and which they may not be able to recollect afterwards. This activity was not compulsory for all the students and also the students were to be cautioned against missing anything coming through the radio while taking notes. This technique of note taking was supposed to take care of the objective (ii) cited above.

The work book is a form of written support material for the pupils. Such support materials are extensively used in Kenya and Australia for utilization of radio in health education programmes. For this study, the work-book proposed to be used had a series of questions with answers, designed with proper sequence where the students were to write the missing letters or words to complete a word or sentence given on the topic of broadcast. The work book was to be provided to the students immediately before the broadcast with necessary instruction. They were to be allowed to read the materials and keep themselves ready to answer them, while the broadcast is on. This techniques was thought to be an alternative to the radio-slide combination for the programmes where there was little scope of using visuals through slides.

4.2.3 Post-Broadcast Activities

The objectives of having post-broadcast activities were :

(i) To revise the concepts and facts communicated through the broadcasts earlier.

(ii) To clarify the doubts and remove misconceptions, if any.

(iii) To minimise the gaps, if any, between the contents of the lesson broadcast and the contents required for that grade.

Like previous sessions, the activities were planned to be selected from the following list depending upon the nature of the topic, content and form of broadcast. Any one or combination of a few of the activities may help in attaining the objectives set. They were : (i) Discussion, (ii) Field trip, (iii) Team teaching, (iv) Visuals (Maps, charts, models, etc.), (v) Role playing, (vi) Guest talk, (vii) Quiz and (viii) Assignments.

Discussion is a common component in any teaching-learning situation where interaction takes place between the teacher and the learners as well as among the learners. This helps in developing higher mental abilities like critical thinking, comprehension, application, etc. Studies conducted by Bane (1925, 1931), Beach (1960), Gerberich & Warner (1936), Richard (1946), Ward (1956), Kohut (1975), Yost (1972), Croker & others (1974) show that discussion has shown significant result in teaching-learming situation.

Also studies taken at the Centre of Advanced Study in Education (CASE , M.S.University of Baroda by Yadav and Govinda (1977), Sansanwal (1977), Ankleswaria (1980), Arun Kumar (1978) and Seshadri (1980) have shown the effectiveness of discussion session in various instructional situations. Yadav and Govinda (1977) used discussion method based on the contents of different units as one of the components while

evolving an instructional strategy for teaching the course Educational Evaluation at B.Ed. level. The instructional strategy evolved was found effective through continuous experimentation. Sansanwal (1977) through an experimental study in programmed learning for teaching Research Methodology course at M.Ed. level, found through students' reactions that discussion session was effective in the instructional situation. Ankleswaria (1980) used discussion for teaching a course on "Nutrition" for Home Science students of Baroda University. Arun Kumar (1978) studied the effectiveness of discussion as a compónent in instruction for teaching Nuclear Chemistry in Standard X. Presently, the studies undertaken in the field of Educational Technology by Menon, Vardhini and Ravindranath have discussion session as an instructional component in various instructional situations starting from secondary school to post-graduate level. Techniques of field trip, team teaching, and guest talk, are also attempted through these on going researches and are found to be useful. So it was hoped that along with these techniques, other techniques of teaching like role playing, quiz and home assignment would be useful for the purpose of this study. Through this study an attempt is made to find out in totality the effectiveness of the strategy by taking various combinations of these techniques with the SBP.

4.3.0 DEVELOPMENT OF INSTRUCTIONAL STRATEGIES

Keeping the above mentioned materials and activities in view, instructional strategies were developed on individual SBPs by developing instructional materials such as slides and work books to be used during the broadcast, developing instructional activities for different sessions, and organizing them meaningfully. As preparation of slides was a time consuming process, for the sake of convenience it was done prior to the development of other activities.

Strategy for each SBP had the following common components (Appendices in Vol.II).

1. The Title
2. An Overview
3. Content Sequence
4. Expected Terminal Behaviours
5. Criterion Test
6. Learning Experiences for Pre-Broadcast, Broadcast and Post-broadcast sessions.

All the 16 scripts and transcripts of SBPs scheduled to be broadcast for grade-VII for the first term of 1978-79 academic session for the subjects, General Science, History, Geography and Oriya were taken for the development of the strategies.

They were :

General Science

(i) Phularu Phala (Fruit from Flower)

(ii) Nakshyatra Mandala (Constellations)

(iii) Manishara Bhabisyata Basasthana - Chandra (Moon, the Future Residence of Man)

(iv) Manusya Kankala O Tara Sanchalana (Human Skeleton and Its Movement).

History

(i) Shikari Krishaka Hela (Hunter Turned Into Farmer)

(ii) Ama Nadikulara Adi Savyata (Early Civilization of Our River Bank).

(iii) Europiya Savyatara Adi Peetha (Original Base of European Civilization).

(iv) Bigyanara Punarjagaranara Patha Pradarshaka - Copernicus, Galileo, Harvey and Newton (Leaders of the Re-emergence of Science - Copernicus, Galileo, Harvey and Newton).

Geography

(i) Prakrutira Chidiakhana (Nature's Zoo)

(ii) Ketoti Pradhan Silpa (Some Important Industries)

(iii) Pruthivira Janabahula O Janabirala Anchala (Thickly and Thinly Populated Areas of the World)

(iv) Krishna Hiraka (Black Diamond).

Oriya

(i) Satyara Pujari Acharya Harihara (Truth Worshipper, Acharya Harihar)

(ii) Paribartana

(iii) Bagala Baguli

(iv) George Bernard Shaw

These programmes were written in Oriya and presented by the experts commissioned by the A.I.R., Cuttack.

4.3.1 Procedure of Development

Development of strategies and their pilot tryouts constituted a continuous process for a period of six months during the first term of 1978-79 academic year. The A.I.R. authorities were requested to supply the programme scripts and their transcripts well in advance for facilitating the investigator to develop the instructional strategies. As the programmes were prepared and presented one after another in a span of seven days time limit, it was not possible to get all the intended programmes at a time in advance. So the scripts and transcripts of the programmes stated earlier were collected every week in advance and the instructional strategies were developed and kept ready for pilot tryout by the time the programme was on the air.

The following procedure was followed in sequence while developing the strategy for each programme:

1. Preparation of content sequence
2. Formulation of terminal behaviours
3. Development of criterion test
4. Development of learning experiences :
   (a) development of instructional materials like slides, work books.
   (b) development of instructional activities.
   (c) integrating the instructional materials and instructional activities with the SBP.

4.3.1.1 Preparation of Content Sequence

The A.I.R. authorities, on request, supplied the scripts and transcripts of the programmes in advance. By going through the scripts of the programmes, the content of the subject matter were written down in sequence. For example in the programme on "Fruit from Flower", content sequence was written in the following manner :

1. Flower is the most beautiful part of the plant.

2. Most of the flowers have four parts. They are :
   (i) Sepals, (ii) Petals, (iii) Stamen, (iv) Pistil.

3. Sepals are thin green leaflike parts on the first row of the flower. Their functions are :

(a) They cover and protect the flower bud.

(b) They support and protect the flower.

All the sepals together is called calyx.

This procedure was followed for all the sixteen programmes taken for the development of the strategy.

4.3.1.2 Formulation of Terminal Behaviours

Corresponding to each of the content sequence, expected terminal behaviours were formulated. Taking the examples cited above, the terminal behaviours for the content sequences were stated in the following manner :

Pupils will be able to

1.1 recognize flower as the most beautiful part of the plant.

2.2 recognize different parts of a flower.

2.3 recognize the position of sepal in the first row of the flower.

2.4 tick out the functions of sepals.

3.5 recognize that all the sepals together is called Calyx.

4.3.1.3 Development of Criterion Test Items

Taking into consideration the behavioural objectives, the corresponding criterion test items were developed. Criterion test was designed to measure the extent to which the

expected learning outcomes were achieved. For the example given above, criterion test items were developed in the following manner.

1.1.1 Which of the following is the most beautiful part of a plant?

(i) Flower ( )
(ii) Leaf ( )
(iii) Stem ( )
(iv) Fruit ( )

(Put a _/ against the correct answer).

2.2.2 Which of the following are the parts of a flower?

(i) Leaf ( ) (iv) Fruit ( )
(ii) Petals ( ) (v) Stamen ( )
(iii) Pistil ( ) (vi) Sepal ( )

(Put a _/ against the correct answers).

3.3.3 The position of sepal is in the :

(i) first row of the flower from outside ( )
(ii) centre of the flower ( )
(iii) second row of the flower from outside( )

(Put a _/ against the correct answer).

3.4.4 Which of the following are the functions of sepals?

(i) To increase the beauty of the flower ( )

(ii) To protect the flower bud ( )

(iii) To attract the bees and other insects( )

(Put a _/ against the correct answer).

3.5.5 All the sepals together is called_____

(Corolla, Calyx, Ovary).

(Pick out the right answer).

In every programme there was link between the content sequence, terminal behaviours and the criterion test items. While developing the criterion test, care was taken to include knowledge, understanding and application items which were taken in the form of multiple choice, completion, true/false, matching and short answer. But the investigator's freedom was restricted in including more understanding and application items as the contents of the broadcasts were based on some information only. Finally, according to the types of items, the test was arranged along with the necessary instruction for responding to the test.

4.3.1.4 Development of the Learning Experiences

In order to attain the terminal objectives, learning experiences were planned for pre-broadcast, broadcast and post-

broadcast sessions. While planning the learning experiences the subject teachers were consulted and their opinions in respect of use of different techniques during pre-broadcast, broadcast and post-broadcast sessions were taken into consideration. Students' background knowledge, their ability to interact in a new situation, teachers' efficiency in handling the broadcast class were kept in mind while selecting and implementing different techniques. Learning experiences were developed in two different phases and finally they were integrated with the radio broadcast. First the instructional materials (slides, work books) were developed and in the second phase the instructional activities were planned by keeping the terminal objectives in view. The details of the procedures of the development of instructional materials and instructional activities are given below.

4.3.1.4 (a) Development of Instructional Materials (Slides, Work Books) to be Used During the Broadcast

Keeping in mind the expected terminal behaviours development of instructional materials like slides and work books were taken up earlier than the development of instructional activities as the investigator had to depend upon the artist and the photographer for this purpose for which 5 to 6 days time was required. In some cases, when there was a programme on English for which strategies were not developed, or the day of broadcast

for Grade VII was a holiday, development of materials were done comfortably. The time was also utilized for development of strategies in respect of other programmes.

Development of Slides

By going through the scripts and the transcripts of the individual programmes, the investigator identified the concepts on which visuals were to be developed. After identifying these concepts, a list of the corresponding visuals was prepared. The Pictures for these visuals were searched through the books of the local libraries, commercial organizations preparing teaching aids, educational institutions etc. Pictures were also hand drawn by an artist when they were not available. After getting all the required pictures, they were converted into the form of slides with the help of locally available expertise and material. Some readymade slides were purchased and some were borrowed from different educational institutions.

Development of Work Books

Work books had questions requiring brief answers, sentences missing few words and words missing a few alphabets. Students were to complete the missing words and alphabets in the space provided in the work books at the time of listening

to the programmes. The scripts of the programmes, on which work books were to be developed, were analysed and the items to be included in the work book were noted down. Care was taken to provide sufficient time gap in between two items. Keeping the items in proper form, maintaining their sequence in accordance with the transcript of the programmes, and putting the instruction required for its use, the work book was duplicated into the required number of copies.

4.3.1.4 (b) Development of Instructional Activities

While planning the instructional activities, the objectives of having pre-broadcast, broadcast and post-broadcast sessions were kept in view. For different programmes, the techniques were selected from the list of techniques discussed earlier in this chapter.

Examples : While planning instructional activities for the lesson on "Moon-the future residence of man" the technique of guest talk was selected. A lecturer in the Department of Physics from the Salipur College was invited to listen to the programme along with the students to highlight the content of broadcast in the post-broadcast session. In this case, the subject teacher wanted a specialist who could throw more light on a science topic like this. Also,it was felt that the presence of an important person in this area of study may

bring novelty which may keep the students attentive towards the programme as a whole. Likewise in the lesson on "Bagala Baguli" it was thought role-playing technique would be appropriate to supplement a dramatised lesson. For the programme "Some of the important industries" which was purely informative to the students, the quiz technique was applied. As the topic was only on the knowledge aspect, it was planned to develop the ability of recalling facts and spirit of competitiveness through a technique like this.

4.3.1.4 (c) Integrating the Instructional Materials and Instructional Activities with SBP

The instructional materials and the instructional activities developed were organized and connected with the SBP meaningfully to form the instructional strategy for each programme. The instructional strategy was to be kept ready by the time the SBP came on the air. In this way, appropriate learning experiences were planned for all the sixteen programmes through different components taken for the development of the strategies. The details of the content sequences, terminal behaviours, criterion tests and the learning experiences in respect of these programmes can be found in (Appendices 1-16 of Volume II). Table 4.1 shows the components and sub-components of the strategies developed for the sixteen broadcast programmes taken for this study.

Table 4.1

Components and Sub-Components of the Strategies

Sr.No.	Name of the Topic	Components of the Pre-broadcast Session	Components During the Broadcast Session	Components of the Post-Broadcast Session
1.	Acharya Harihar (O_1)	(i) Question Answer (ii) Narration of Anecdotes	(i) Radio-vision (ii) Note taking.	Discussion
2.	Paribartana (O_2)	(i) Visuals (ii) Story telling	(i) Radio-vision (ii) Note taking	(i) Discussion (ii) Role playing
3.	Bagala Baguli (O_3)	Question Answer	(i) Radio-Vision (ii) Note taking	Role Playing Discussion
4.	George Bernard Shaw(O_4)	Question Answer	Work book	Discussion
5.	Shikari Krishaka Hela(H_1)	Questions Answer	(i) Radio-vision (ii) Note taking	Discussion Discussion
6.	Ama Nadi Kulara Adi Savyata (H_2)	i.Use of Models ii.Question Answer	(i) Radio-Vision (ii) Note taking	Discussion
7.	Europiya Savyatara Adbeetha (H_3)	Question Answer	(i) Radio-Vision (ii) Note taking	Quiz
8.	Bigyanara Punarjagaran -ara Patha Pradarshaka (H_4)	Question Answer	(i) Radio-Vision (ii) Note taking.	Discussion
9.	Prakrutira Chidiakhana(G_1)	i.Question Answer ii. Use of map	(i) Radio-Vision (ii) Note taking	Discussion
10.	Ketoti Pradhan Silpa(G_2)	Question Answer	(i) Radio-Vision (ii) Note taking	Quiz
11.	Janabahula O Jana Birala Anchala (G_3)	Question Answer	(i) Radio-Vision (ii) Note taking	Team Teaching
12.	Krishna Hiraka (G_4)	Question Answer	(i) Radio-Vision (ii) Note taking	Discussion
13.	Phularu Phala (Sc_1)	i.Visuals ii.Question Answer	(i) Radio-Vision (ii) Note Taking	(i) Field Trip (ii) Discussion cum demonstration
14.	Manishara Bhabisyata Basasthana-'CHandra' (Sc_2)	Question Answer	(i) Radio-Vision (ii) Note taking	Guest Talk
15.	Nakshyatra Mandala(Sc_3)	Question Answer	(i) Radio-Vision (ii) Note taking	Discussion
16.	"Manusya Kankala O Tahara Sanchalan"(Sc_4)	i.Use of Model ii.Question Answer	(i) Radio-Vision (ii) Work Book	Discussion

4.4.0 TRYOUT OF THE STRATEGIES

The strategies developed for effective utilization of the sixteen broadcast programmes (cited earlier) were tried out before validating them through experiments.

It was decided to accept a strategy as effective if the mean achievement of the students was found to be 60 per cent or above in respect of that programme.

The purpose of the tryout was to validate the strategies and bring further developments on the basis of the result obtained.

4.4.1 The Tryout

Development of strategies and the tryout were a continuous process for a period of six months - beginning from July 1978. An attempt was made to see the working of the strategies in the real classroom situation without disturbing the school time table. So the tryout was done during the 45 minutes classroom period in which the students usually listen to the 20 minutes broadcast.

Sample

For the tryout of the strategies one group of students (50 in number) of Grade VII of Secondary Board High School, Cuttack, enroled in the session 1978-79 were taken as

the subjects. This was done keeping in view the listening background of the students, administrative cooperation needed for the study and availability of sufficient number of students.

Procedure Adopted : The following preparations were made in advance for the purpose of tryout :

1. Orientation of teachers
2. Class arrangement
3. Instruction to students for effective listening in the new situation
4. The tryout
5. Administration of criterion test
6. Analysis of the result.

Orientation of Teachers: As the tryout of the strategies included subjects like General Science, History, Geography and Oriya, four subject teachers teaching these subjects were selected on the basis of their cooperativeness, communicability and other traits necessary for effective classroom teaching. This was done in close consultation with the headmaster of the school. Matters relating to the tryout of the strategies such as class arrangement, orientation, etc. were discussed with the group of teachers selected. Instructions were also given to the teachers on working of the strategy in respect of the individual programmes. This was done every time before the use of the strategy for a particular SBP in the classroom.

Class Arrangement: The school authorities provided a separate classroom on request where the arrangement was made for conduct of the tryout. The room was physically well equipped with the availability of common equipment. Arrangement for making the room semi-dark, were made by using curtains for the doors and windows. Acoustics of the classroom was tested by playing radio and producing sound at various pitches. The sitting arrangement was slightly changed from the normal classroom arrangement for facilitating effective discussion among the students.

Instruction to Students: As the students were to be exposed to the listening of SBP in a way different from their regular way of listening, necessary instruction on how to listen to the programmes, take part in the discussion, appear in the test and maintain other formalities required for effective listening; were given to the students by bringing them to the listening room prior to the beginning of the tryout. The visibility of blackboard, projected pictures and the audibility of programmes were also tested by enquiring from the students sitting at different places in the classroom.

The Tryout : The tryout started with necessary pre-broadcast activities carried out by the teacher. A good radio set was used in order to facilitate effective listening. The slides along with the projector were ready by the time the broadcast came through the radio. In the pre-broadcast

session the teacher also trained the students on how to write the main points like dates, events, names of the places, etc., in an abbreviated form. It was also mentioned that only those things which may not be remembered may be noted.

As the script of the programme was in the hand, no difficulty was felt while projecting the slides in synchronisation with the content points, coming through the radio. It would have been better if some signals could have been given for projecting the pictures. As the programme was prepared by the A.I.R. and the strategies were developed by the investigator, it was not possible to give such signals. After the end of the broadcast, the students were allowed to buzz with each other for a minute or two and then the post-broadcast activities were conducted by the teacher. (The details of the instructional strategy on each programme have been given in the Appendices of Volume II).

Administration of the Criterion Tests : The criterion test prepared on each lesson broadcast was kept ready in the cyclostyled form to be administered on the day following the broadcast. This was done to enable the students to go through the topic in their textbook and prepare for the test. This was thought to be an activity in continuation with the post-broadcast activities done in the classoom. Each time the test was administered with the help of the teachers under suitable conditions. The scores of the students' achievement

were recorded and subjected to analysis.

In this way, the tryout of the strategies on sixteen different SBPs on History, Geography, Oriya and General Science continued for a period of six months from the beginning of the academic session.

4.4.2 Analysis of Results

Mean percentages and SDs of students' achievement on the criterion tests on Oriya (O), History (H), Geography (G) and General Science (Sc) were calculated which are shown in the table 4.2 .

Table 4.2

Scores of Students' Achievement on the Criterion Test

	ORIYA (O)			
	O_1	O_2	O_3	O_4
Mean Percentages	56.00	68.30	72.14	71.72
SD	7.33	6.83	4.15	6.59
	HISTORY (H)			
	H_1	H_2	H_3	H_4
Mean Percentages	71.25	65.50	64.58	65.34
SD	7.50	5.65	5.63	7.24

	GEOGRAPHY (G)			
	G_1	G_2	G_3	G_4
Mean Percentages	64.60	68.50	67.78	74.22
SD	6.02	6.50	6.51	4.66

	GENERAL SCIENCE (Sc)			
	Sc_1	Sc_2	Sc_3	Sc_4
Mean Percentages	61.60	61.94	64.64	56.28
SD	7.17	5.00	6.96	6.61

Out of sixteen programmes, students' achievement in terms of the percentages of scores were seen to be above sixty per cent in 14 cases and were above fifty six per cent in the remaining two. The lower level of achievement in case of those two strategies may be due to inadequacy of the learning experiences provided to the pupils. So it was thought to bring these strategies at par with other strategies by way

of improving the learning experiences provided.

4.4.3 Modification of the Strategies

Improvement in the strategies was brought by modifying the visuals, criterion test items and the learning experiences without any change in the format on the basis of the experiences gained through the tryout. Time to time feedback received from the students, teachers and casual observers on different aspects of the strategies were also taken into consideration.

Modification and Addition of Slides: Each time after the tryout, the students were given a response sheet on which they had to write the names of the pictures which were absent in the process, but they would like to see them, and the names of the pictures shown to them, but are unnecessary for the purpose. On the basis of students' responses some new slides were added to a few programmes. This was done only in two cases, i.e. 'MANUSYARA BHABISYATA BASASTHANA, CHANDRA' (Moon - the Future Residence of Man) and 'AMA NADI KULARA ADI SAVYATA' (Early Civilization of our River Banks) where five slides were added. All other slides were thought by the students to be useful in the programmes.

Modification of Test Items: The language and style of presentation of the test items were improved by analysing the answer papers. This was done for the items where most of the

students failed to give the correct responses. Only in case of three criterion tests a few changes were made.

Modification of the Learning Experiences: Learning experiences provided in different stages of the tryout were observed carefully in terms of students' participation, their responses to the teacher's questions, teacher's ability of handling different situation and the time needed for organization of the pre-broadcast, broadcast and post-broadcast activities. On the basis of the observation, programmes on 'KRISHNA HIRAKA' (Black Diamond), 'ACHARYA HARIHARA' and 'EUROPIYA SAVYATARA ADI PEETHA' (Early base of European Civilization) underwent changes in respect of the learning experiences. In case of 'KRISHNA HIRAKA' more learning experiences were provided as the post-broadcast session was completed before the scheduled time limit. In case of 'EUROPIYA SAVYATARA ADIPEETHA', it was felt to have more time for post-broadcast discussions as it could not be completed in time. This change was made only by taking a few minutes, from the pre-broadcast session where adjustment was made to give a brief introduction to the broadcast by the teacher. In other programmes, a few minor changes were made in the language of presentation without disturbing the contents.

The strategies in respect of O_1 and Sc_4 where the group mean fell below 60 per cent of the criterion mark, were thoroughly improved by checking the learning experiences in the pre-broadcast, during broadcast and post-broadcast sessions.

Finally, the improved form of the strategies along with the criterion tests were ready for the experimental tryout scheduled to be conducted in the next academic session i.e. 1979-80.

REFERENCES

A.I.R., Cuttack, Satyara Pujari Acharya Harihara, Radio Transcript on Oriya for Grade VII, A.I.R.,Cuttack,1978.

_____ Bagala Baguli, Radio Transcript on Oriya for Grade VII, A.I.R., Cuttack, 1978.

_____ Paribartana, Radio Transcript on Oriya for Grade VII, A.I.R., Cuttack, 1978.

_____ George Bernard Shaw, Radio Transcript on Oriya for Grade VII, A.I.R., Cuttack, 1978.

_____ Shikari Krishaka Hela, Radio Transcript on History for Grade VII, A.I.R., Cuttack, 1978.

_____ Ama Nadi Kulara Adi Savyata, Radio Transcript on History for Grade VII, A.I.R., Cuttack, 1978.

_____ Europia Savyatara Adipeeth, Radio Transcript on History. for Grade VII, AIR, Cuttack, 1978.

_____ Bigyanara Punarjagaranara Patha Pradarshaka - Copernicus, Galileo, Harvey and Newton, Radio Transcript on History for Grade VII, A.I.R., Cuttack, 1978.

_____ Prakrutira Chidiakhana, Radio Transcript on Geography for Grade VII, A.I.R., Cuttack, 1978.

_____ Ketoti Pradhan Silpa - Louha, Ispat, Karpasa, Radio Transcript on Geography for Grade VII, A.I.R., Cuttack, 1978.

_____ Pruthivira Janabahula O Janabirala Anchala, Radio Transcript for Grade VII, A.I.R., Cuttack, 1978.

_____ Krishna Hiraka, Radio Transcript on Geography for Grade VII, A.I.R., Cuttack, 1978.

_____ Phularu Phala, Radio Transcript on General Science for Grade VII, A.I.R., Cuttack, 1978.

_____ Nakshyatra Mandala, Radio Transcript on General Science for Grade VII, A.I.R., Cuttack, 1978.

_____ Manusyara Bhabisyata Basasthana - Chandra, Radio Transcript on General Science for Grade VII, A.I.R., Cuttack, 1978.

_____ Manusya Kankala O Tahara Sanchalana, Radio Transcript on General Science for Grade VII, A.I.R., Cuttack,1978.

Ahluwalia, S.L., A.V. Geography : Use of Audio-Visual Materials in the Teaching of Geography, Department of Field Services, National Institute of Education, New Delhi, 1969, Pp.1-6.

Ankleswaria, N., A Comparative Study of Different Strategies to Teach Nutrition to Home Science Students of Varying Intelligence, ongoing doctoral study, CASE, M.S.University, Baroda, 1980.

Arunkumar, Development of a Teaching Strategy for the Unit Nuclear Chemistry in Std.X and a Study of Its Effect on Achieving Set objectives, Unpublished M.Ed. Dissertation, CASE, M.S.University, Baroda, 1978.

Bane, C.L., The Lecture Vs The Class Discussion Method of College Teaching in School and Society, Vol.21, 1925, Pp. 300-302. Quoted in Chakrabarti,M., 'An Inquiry Into Strategies of Classroom Teaching,'Ph.D. Thesis, CASE, M.S.U., Baroda, 1977.

Beach, L.R., Sociability and Academic Achievement in Various Types of Learning Situation, Journal of Educational Psychology, Vol.51, Pp. 208-12. Quoted in Chakrabarty,M., An Inquiry Into Strategies of Classroom Teaching, Ph.D., Thesis, M.S.U., 1977.

Bloom, B.S. (ed.) et al, Taxonomy of Educational Objectives : Cognitive Domain, New York, David McMally Co. Inc.,1956.

Bloom, B.S., et al (ed.), Handbook of Formative and Summative Evaluation of Student Learning, McGraw Hill Book Co., New York, 1971.

Blough, G.O. & Schwartz J., Elementary School Science and How to Teach it, Holt, Rinehart and Winston, New York, 1969, P.31.

Board of Secondary Education, Orissa, Sahitya Sindhu, Text Book for Grade VII, Ruby Printers, Cuttack, 1977, Pp.11-24, 47-54, 88-107, 142-156.

_____ Pruthivi Itihasa, Text Book for Grade VII, Text Book Press, Bhubaneswar, 1972, Pp.1-8, 20-26, 33-39, 121-126.

_____ Sankshipta Bhu Parichaya, Text Book for Grade VII, Grantha Prakashani, Cuttack, 1978, Pp.28-38, 125-140.

_____ Madhyamika Bigyana, Text Book for Grade VII, Prasad Press, Cuttack, 1977.

Chakrabarti, M., An Inquiry Into Strategies of Classroom Teaching, Unpublished Ph.D. Thesis, CASE, M.S.U., Baroda, 1977.

Crocker, R.K. & Others, A Comparison of Structured and unstructured Modes of Teaching Science Process Activities, ERIC, Vol.9-10, Oct.1974. Quoted in Chakrabarty,M., An Inquiry into Strategies of Classroom Teaching, Ph.D. Thesis,M.S.University, Baroda, 1977.

Department of Field Services, NIE, Improving Instruction in Geography, Vol-1, Navin Press, New Delhi, 1969, Pp.1-49.

Foxal, A., Radiovision - A Survey and Discussion, in Programmed Learning and Educational Technology, Journal of APLET, Nov., 1972, Sweet & Maxwell, Vol.9, No.6 , P.300.

Freeman, K., et al, Helping Children Understand Science, Holt, Rinehart & Winston, N.Y., 1958, P.268.

Gerberich, J.R. & Warner, K.O., Relative Instructional Efficiency of the Lecture and Discussion Methods in a University Course in American National Government, Journal of Educational Research, Vol.29, 1936, Pp.574-9. Quoted in Chakrabarty,M., An Inquiry into Strategies of Classroom Teaching, Ph.D. Thesis, M.S.University, Baroda, 1977.

Kohut,S., A Comparison of Student Achievement and Retention on Subjective Vs Objective Social Studies Examinations as Influenced by Different Instructional Patterns, Journal of Educational Research, Vol.66, No.9, 394, May-June,1973, Quoted in Chakrabarty,M., An Inquiry into Strategies of Classroom Teaching, Ph.D. Thesis, M.S.University, Baroda, 1977.

Krishnan,S.S., Development of Multimedia Package for Teaching a Course on Audio-Visual Education, ongoing Ph.D. study, CASE, M.S.U., Baroda, 1980.

Lefranc, R., 'Radiovision as an aid to literacy teaching in Niger'. New Educational Media in Action - Case Studies for Planners-3, International Institute of Educational Planning, UNESCO, France, 1967, Pp.44-57.

Lever, D.E., 'A Critical Study of the Various Methods of Teaching Science in the Junior School with Reference to the Place of Broadcasting', Ph.D. thesis, University of Reading, quoted in Foxal,A. 'Radiovision - A Survey and Discussion'in Programmed Learning & Educational Technology, Journal of APLET, Vol.9,No.6,Nov.1972, Sweet & Maxwell, London, 1972, P.311.

Menon,M.B., 'Evolving a Multimedia Approach to Teaching at Post-graduate Level', ongoing Ph.D. study, CASE, M.S.U., Baroda, 1980.

Menon, S.B., Relative Effectiveness of Different Instructional Media in Teaching Physics at Secondary School Level, Unpublished M.Ed. Dissertation, CASE, M.S.University of Baroda, 1978, Pp.57-64.

Nene, R.A., Developing a Multimedia Kit on Educational Technology in Gujarati Language, M.Ed. Dissertation, 1978, M.S.U.

Ravindranath, M.J., Evolving a Multimedia Approach for Teaching Biology at the Secondary School Level, on going doctoral study (Mimeographed), CASE, M.S.U., Baroda, 1980.

Richard, P.B., 'An Experimental Study of the Effectiveness of Group Discussion in the Teaching of Factual Content', Summaries of Doctoral Dissertations, North-Western University, No.14, 1946, Pp.72. Quoted in M.Chakraberty's 'An Inquiry into the Strategies of Classroom Teaching', Ph.D. Thesis, M.S.U., 1977.

Sansanwal, D.B., An Experimental Study in Programmed Learning for Teaching Research Methodology Course at M.Ed. Level, unpublished Ph.D. thesis, CASE, M.S.University, Baroda, 1977.

Sekerak, R., 'Pilot Trials in Radio Instruction - Radiovision' (Report by U.S. AID (T) Radio Technician), in European Research in Audio-Visual Aids. Council for Cultural Co-operation of the Council of Europe. Harrison, J.A.(Ed.) (1966) National Committee for Audio-Visual Aids in Education, on behalf of the Council of Europe. Quoted in Foxal,A. 'Radiovision - A Survey & Discussion in Programmed Learning & Educational Technology, Journal of APLET, Vol.9, No.6, Nov.1972, Sweet & Maxwell, London, 1972, P.312.

Seshadri,M., An Experiment in the Use of Programmed Instruction in Secondary Schools, Unpublished Ph.D. Thesis, M.S. University, Baroda, 1980.

Tannenbaum,H.E. & Stillman,N., 'Science Education for Elementary School Teachers', Allyn and Bacon, Inc., 1960.

Vardhini,V.P., Development of Modules for Maximising Attainment of Instructional Objectives in Physics - Standard VIII, on going doctoral study, CASE, M.S.University, Baroda, 1980.

Ward,J.M., 'Group Study Versus Lecture Demonstration Method in Physical Science Instruction for General Education Students', Journal of Experimental Education, Vol.24, Pp.199-210, Quoted in M.Chakrabarty's 'An Inquiry into Strategies of Classroom Teaching',Ph.D.Thesis,M.S.U., Baroda, 1977.

West, R.H., Organization Outside the Classroom, Basil Blackwell, 1970, Oxford, Pp.12-23.

Yadav, M.S. & Govinda, R., Evolvement of an Instructional Strategy for Teaching Educational Evaluation, in Hills,P. & Gilbert, J. (Eds.) Aspects of Educational Technology, Vol.XI, Kogan Page, London, 1977.

Yost, D.E., 'The Effect of Two Instructional Methods on Achievement, Critical Thinking and Study Habits and Attitudes in Tenth Grade American Government Classes', Dissertation Abstract International, Vol.33, No.7, 1973, 3775-A. Quoted in M. Chakrabarty's 'An Inquiry into Strategy of Classroom Teaching', Ph.D. Thesis, M.S.University of Baroda, Baroda, 1977.