CHAPTER 6

SUMMARY, CONCLUSIONS AND SUGGESTIONS

6.1 INTRODUCTION

No experimental studies have been reported in India, using multi-media package and modular approach for a self-learning instructional package for teaching any vocational training course. Instructional modules however, have been prepared for isolated lessons and topics or certain topics by the International Labour Organisation and some other western and eastern countries. In any system, it is possible to bring about changes by manipulating and controlling the various events. In an educational and training system, the environment and instructional events are many, it is not very easy to manipulate and control them to bring about all the desired changes at one instance. Any change is resisted, and no change is desirable, for the sake of effecting a change. In the simple instructional system presented here (fig. 6.1) Kozme 1978, has identified the instructor, learner, medium, subject-matter, evaluation and environment as the components. In the present instructional development for a course on Audio Visual Education, a multi-media package has been designed (subject matter) for different modes - individual, small group and large group - with different media (environment and medium) for enabling the learner to learn the subject matter either in the class-room, or outside the class-room, with self evaluation techniques during the course, and end evaluation for each module and course to be evaluated by the instructor, with the instructor as the manager of the learning environment, a changed performance requirement for him. All this have been done only

with one intention, namely, improving the effectiveness and efficiency of the present methodology so as to enable the instructor trainees learn better, faster and remember longer. Moreover, the present design has been subjected to better and systematic scientific scrutiny and test to obtain reliable data. In the present project, the effort has been to maximise the result, while keeping the time schedule and cost under certain desirable limitations, so that it becomes workable, in similar situations. The research findings, reports Malhotra (1981) though improve students' achievement, they are not economically productive, waste time of higher ability students, waste valuable time of teachers in waiting and do not permit low achieving students to receive enrichment. It is a well known fact that innovations, teaching methods or technology in themselves do not produce positive effects on the achievement of learners, but it is some features of the instructional strategy that makes the difference. In any instruction involving motor skill, it is an accepted doctrine that skill is perefected by practice, and it is not possible for any instructional situation within a small period to provide all the necessary practice. With these as the basics, the instructional development has been done by the investigator keeping the constraints operating in the system into consideration. A model for development of skill and knowledge was developed by the investigator as a first step consisting of four phases - Pre-assessment and identification of needs, Learning related instructional elements, Practising skill elements, and evaluating learning outcomes i.e., skill and knowledge. The model was applied to the design and development of multi-media instructional package in the subject of Audio Visual Education for the instructor trainees following the nine teaching steps and events as listed by Gagne 1977 and Gagne and Briggs 1974 enumerated in para 4.9 of chapter 4 under sequencing of instruction and twenty three

conditions of learning given in para 4.13 of chapter 4. This led to the development of multi-media package for teaching a course an Audio Visual Education, the present study.

6.2 Significant aspects of the study

The present investigation, which is of a development nature, has been an attempt to systematisation of the instructional process in the instructor training programme for the vocational training scheme. Systematisation has been attempted by developing a multi-media package, and the package was conceived of different components - media and methods - for different modes, all identified and selected keeping in view the instructional objectives to be achieved for the course, the capabilities of these methods and media in achieving the stated objectives, structure of the content, learner's characteristics, and the feasibility of the components in terms of cost and time. The total package has been validated for their effectiveness in terms of the achievement of the instructor trainees on criterion tests for each of the five modules and the comprehensive course test, and the attitude/reaction of the instructor trainees toward the multi-media package.

Another aspect of study was the study of change in motivation of the instructor trainees to learn through the multi-media package of the whole course. A third aspect of study was the study of the relationship between the instructor trainee's achievement and his English language ability, through which the course was administered. Yet another important consideration taken up for the study was the feasibility of the strategy in terms of time and cost required for regularly using the developed multi-media

package for teaching the course. Besides, these stated factors, one more important point for the study, was how far modular approaches, with multi-media strategy for different modes of implementation will work for vocational training programme, and whether self-study learning package will be effective for motor-skill area.

Specifically this study had the following objectives in view:

1 To develop a multi-media package for teaching a course on 'Audio Visual Education', for the Instructor Training Programme, at the Central Training Institute, Madras.

2 To find the effectiveness of the multi-media package in terms of achievement of the instructor trainee on criterion referenced tests.

3 To find the effectiveness of the multi-media package in terms of change in attitude of the instructor trainees toward the multi-media package

4 To study the relationship between the instructors achievement on comprehensive course test and his English language ability through which the course was administered.

5 To study the feasibility of the multi-media package in terms of (a) time and (b) cost for the instructor training programme.

6.3 Methods and Procedure

6.3.1 Research Design

In consideration of the objectives visualised for the study, it was

decided that the research study adopted should be such that it helps the development of a multi-media package to teach a complete course and study the functioning of the approach in real class-room situation. Hence, the investigator decided to adopt a single group design where the multi-media package would be tried out for the whole course by collecting evidence and validate the materials in a real institutional situation, existing at present.

6.3.2 Sample

The target population for the course on 'Audio Visual Education' taught using the multi-media package consisted of those enrolled for the instructor-training programme at the Central Training Institute for Instructors, Madras either as pre-service or as in-service candidates during the session 1981-1982. The trainees were not expected to have any pre-conception on the aspects of audio visual education, but a general understanding of the instructional process was intended as entry behaviour, which they get during the first phase (semester) of their instructor training programme. In addition they were expected to have a fair knowledge of English upto matriculation level (High School Standard). According to the Service conditions for recruitment, every instructor must have passed atleast matriculation with a pass in the Diploma or National Apprenticeship course or National Trade Certificate in the appropriate branch or discipline.

For the validation of the multi-media package, the sample consisted of 127 instructor trainees enrolled during the year 1981-1982 for the instructor training programme at the Central Training Institute for Instructors, Madras. These instructor trainees were from different branches (disciplines, Machine-

shop, Electrical shop, Heat Engine, Civil Draughtsman and Foundry group). They hailed from different states of India. Sixteen of them were eliminated as they were either irregular or dropped out. In all, there were 111 instructor trainees available for the entire period of the experimental study.

6.3.3 Instrumentation

The instruments used for the collection of data in the experimental study were:

1 Criterion tests: Criterion referenced tests were developed for each of the objectives, and the test items for each one of the five modules of the course were grouped together for administration, as pre-post tests.

2 Comprehensive course tests: Comprehensive test was developed representing sample terminal behaviours from all the elements of the five modules, as pre-post tests.

3 Attitude scale: Attitude scale to measure the instructor trainees' attitude toward multi-media package was developed and administered at the beginning and end of the course, to measure the change in attitude.

4 English language ability test: Designed at matriculation level, was administered at the commencement of the experiment.

6.3.4 Procedure: The following procedure was adopted in conducting the experiment. The study was conducted in two phases.

Phase - I : Development

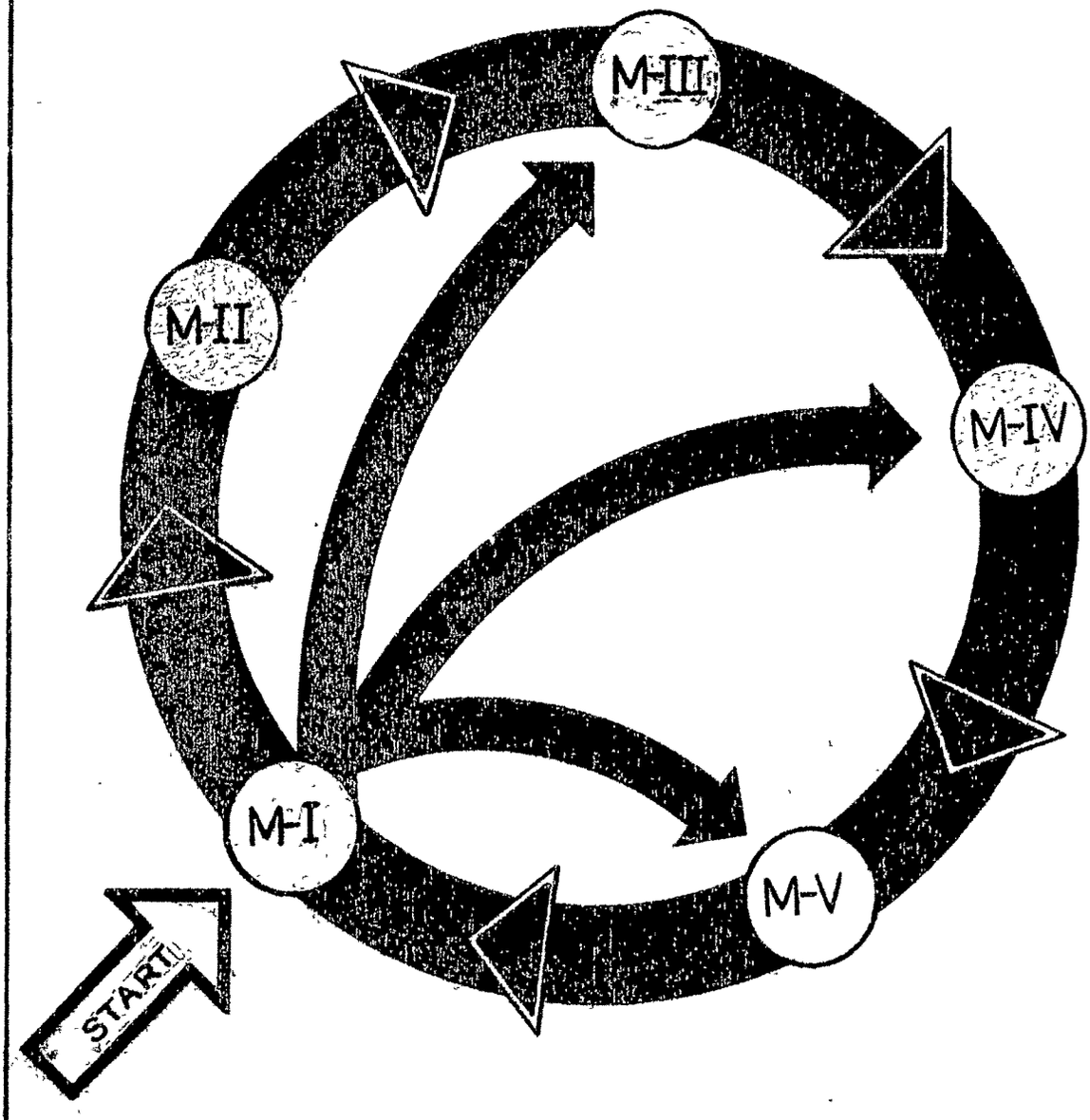
In consideration of the objectives of the course, the development aspect included analysis of the course content based on the syllabus for the subejct matter, and on the sequence in which they are to be taught and specifying overview, general objectives, goals and specific objectives. Task analysis was done by giving appropriate weightage. A team of instructional developers consisting of three instructional staff members (subject matter specialists) and three methodology specialists working at the Central Training Institute, Madras, NCERT and SCERT, Madras worked out the project. On the basis of the logical relationships among terminal behaviours, different teaching points were sequenced modulewise, and further subdivided into manageable learning elements called units; each one unit not to exceed 45 minutes of class-room learning time. The selection of different components of the media and methods to the various instructional inputs were arrived at based on the content and objectives specified. Other important points that weighed the decision in this regard are the physical facilities and hardware available at the C.T.I., Madras, the time and cost involved in implementing the project. As the content was on audio visual education, which included the nature and potential of various instructional inputs, it was thought appropriate to present the details about an instructinal input through the audio visual media for the major part of the course.

The division of the course into five modules and 35 units with 51 practical exercises was finalised based on the discussions on the treatment, feasibility of administering the multi-media package, level of understanding of the instructor trainees and the time factor, with the subject experts

228 A

AUDIO VISUAL EDUCATION

MODULE -



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and methodology specialists. Evaluation experts were consulted for finalising the criterion referenced tests for each module, each and every objective, the comprehensive test items and the classification of the objectives. As there is no external examiner for the subject and only sessional marks are awarded, the concerned faculty member who administered the course was also consulted in the preparation of these test items.

The entire course was practical oriented as the major aim was to provide experiences in producing appropriate audio visual aids and operation of audio visual equipment and related theooretical knowledge with reference to the skill content. The first module was provided as a link between the Pedagogy and Principles of Teaching; Instructional Design and use of different aids in the practice teaching and demonstration sessions. Following the formulation of the instructional objectives, terminal behaviours, criterion referenced test items, identifying appropriate instructional components into modules and learning elements giving due consideration to the nature of the content and availability and feasibility of the media, the course had the following final form:

Module I Introduction to Instructional Design.

Programmed slide sound modular units 1-3 with workbook.

Programmed Instructional materials with panel book for units 4 and 5.

Self-evaluating unit tests with answer keys.

Discussion.

Feedback.

Module II Non Projected Visual Aids.

Self-contained, self-paced, self-directing, individualised textual learning elements with student manual for practical exercises 1-35 and answer keys.

Discussion

Feedback

Module III Projected Aids

Programmed multi-imagery slide sound modular units 1-10 with workbook.

Self evaluating unit tests with answer keys.

Student manual for practical exercises 36-41 and answer keys.

Discussion.

Feedback.

Module IV Duplicating processes.

Self-contained, self-paced, self-directing, individualised textual learning elements with student manual for practical exercises 42-47, with instruction demonstration of the practical exercises.

Self evaluating unit tests with answer keys.

Discussion.

Feedback.

Module V Audio Aids.

Self-contained, self-paced, self-directing, individualised, textual learning elements and learner activities with practical exercises

48-51. Demonstration to be practiced with equipment in front, pictures, and audio instruction.

Self-evaluating unit tests with answer keys.

Discussion.

Feedback.

Module tests 1-5 : Criterion Referenced Module Tests on every objective.
Comprehensive Criterion Referenced Course Tests.

Course Test : On sample terminal behaviours from all modules.

Phase II : Validation

The multi-media package for the course on audio visual education after incorporating the changes on the basis of experience gained through the initial tryout, was utilised for regular instructional work at the Central Training Institute for Instructors, Madras during the session, 1981-1982, and studied for its effectiveness and feasibility. Field tryout was conducted on five groups of learners enrolled for the instructor training programme. Validation of the multi-media package has been done by studying the performance of instructor trainees on each of the criterion tests - module as well as comprehensive course tests. These tests were analysed in terms of four categories of objectives - knowledge, comprehension, higher mental abilities, skills, and all combined together, and appropriate statistics like mean, standard deviation, and 't' values of the gain scores were used.

Having given the validation tools, scoring keys, and detailed instructions, the investigator left to the concerned instructional staff to do the evaluation,

under the guidance of the faculty leader. The evaluation was also checked by the investigator, and later they were tabulated for each unit, module and the whole course, for each factor - knowledge, comprehension, higher mental abilities, skill and total separately, their percentages worked out and statistical analysis done. This scoring was entrusted to the concerned instructor to avoid direct interference by the investigator and to see that there is a free and fair evaluation. More over the sessional marks were given based on these tests, by the concerned instructor for the whole course, every month and at the end of the course.

6.4 Results and Discussions

6.4.1 Effectiveness of the multi-media package in terms of achievement of the Instructor trainees on the criterion tests

a Percentage of scores on post test at the end of each module and the course test

As explained in para 5.5.1 and shown in table 5.6, 98% of the trainees obtained more than 80% of the marks on the final post test, against 60% required for pass mark. Even the other two percent were on the margin near 80% in the range 70-79%. Thus the performance was very good. The module-wise break up was significant from the fact that 66%, 69%, 78%, 96% and 92% of trainees secured 80% and above in the [illegible] module tests for module I, II, III, IV and V respectively.

b Post test scores at the end of each module and the whole course

The mean percentage of the post test scores at the end of the course was 90.459 and 84.161, 81.414, 83.631, 83.478, 83.928 in module I, II, III, IV and V respectively; all above 80% of the marks which was the distinction percentage. The mean was never less than 90% in the course test in any of the categories of K, C, and H or all put together and it was more than 80% in the Skill category.

In all the modules, the means of the post test scores were very high in each of the four categories of the objectives namely K, C, H, and S the lowest of them being 78.464 under the comprehension level in module III and the highest was the higher mental abilities under module IV, the percentage being 98.423

c Comprehensive test - Mean gain score - total scores

The performance of instructor trainees in the final course test was thus found to be one of the best, the institution could achieve so far. The mean of gain scores on the comprehensive test, in the total score was significant at 0.01 level for the 't' value. The mean of gains stood at 84.045%, and the mean score on post test was 90.46.

d Module tests - Mean gain scores - total scores

The performance of the instructor trainees on the criterion tests at the end of each of the five modules were studied on the total scores

obtained, and the mean gain scores for all modules were found to be significant at 0.01 level for the 't' values.

e Comprehensive and module tests - Mean gain scores - Knowledge objectives

The performance of the instructor trainees on the knowledge objectives, on the criterion tests at the end of each module and the course were studied on the scores obtained and the mean gain scores were found to be significant at 0.01 level for the 't' values.

f Comprehensive and module tests - Mean gain scores - Comprehension

The performance of the instructor trainees on the comprehension objectives, on the criterion tests - at the end of each module and the course - were studied on the scores obtained and the mean gain scores were found to be significant at 0.01 level for the 't' values.

g Comprehensive and module tests - Mean gain scores - Higher mental abilities

The performance of the instructor trainees on the higher mental abilities objectives, on the criterion tests - at the end of each module and the course - were studied on the scores obtained and the mean gain scores were found to be significant at 0.01 level for the 't' values.

h Comprehensive and module tests - Mean gain scores - skills

The performance of the instructor trainees on the objective pertaining to motor skills, on the criterion tests - at the end of each module and the course - were studied on the scores obtained and the mean gain scores were found to be significant at 0.01 level for the 't' values.

6.4.2 Effectiveness of the multi-media package in terms of achievement of the Instructor trainees on the change in attitude toward the multi-media package

An attitude scale developed to measure the attitude of the instructor trainees toward the multi-media package was administered at the begining and at the end of the experiment on the participants, and the mean attitude change was found to be significant at 0.01 level on the 't' value. ('t' value 8.70). The attitude change was in the favourable direction.

6.4.3 Relationship between achievement and English language ability

The achievement of the Instructor trainees was studied on the English language ability, through correlation coefficient, and it was found out that it was significant at 0.01 level.

6.4.4 Feasibility of multi-media package in terms of cost and time

The feasibility of the multi-media package has been established in terms of cost involved in reproduction of the various resource materials

and the time scheduling in an actual institutional set up.

6.5 CONCLUSIONS

The instructional strategy was evolved through continuous effort for over a period of three years and the final experimentation took one semester of six months, at the Central Training Institute for Instructors, Madras. The main motive behind this study has been to systematise instructional work with a view to increasing its effectiveness and efficiency. In the present case an attempt has been made to achieve this with maximum utilisation of available human resource without classroom lectures. Though the initial cost of production of the multi-media package was on the higher side for an individual investigator to bear, the cost of reproducibility was within standard acceptable norms. Such works taken on an institutional basis with better funding facilities and manpower availability, could bring better combinations of multi-media materials with more sophistication. Another important feature of the strategy relates to the conditions under which it has been evolved. When experiments are conducted in extra-class situations, not during the regular teaching-learning schedules, they do not suggest any practical strategy for implementing the new approach. It was explained that in the present case, the experiments were conducted strictly within the schedules of instructional work specified by the Faculty in the real situation. This points to the administrative feasibility of utilising the strategy for instructional purposes.

6.6 SUGGESTIONS

The kind of study undertaken, being the first of its nature, in the

field of vocational training raises number of questions.

a What will be the effect of administering systematic instruction using modular approach and multi-media package, with similar evaluation procedures, unit, module and course tests, for all other courses, for the instructor training programme together with the reaction of the teacher community?

b What will be the effect of multi-media package consisting of combinations of different mediated materials for correspondence course in Principles of Teaching and other theoretical subjects mainly involving cognitive abilities?

Finding answers to such questions through further research, will provide sufficient firm foundation for universal use of multi-media package in other areas also. So continued work is recommended, on the following:

1 The effect of multi-media package (the same topics) consisting of different components than those used in the present study, on the learners.

2 The effect of modular approach on giving self-learning multi-media package of instruction in other areas and disciplines of vocational training.

3 The effect of providing different components of multi-media package depending on (a) student's preferred learning styles and (b) teacher's preferred instructional methods on instructor training programme.

4 The effect of applying the modular approach on giving self-learning multi-media package of instruction on the instructors workload.

5 The effect of applying the modules of the multi-media package separately, on different population who have the same syllabus for their teacher training programmes i.e., B.Ed. and B.Tech.Ed.

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