CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

Home Science is defined as systematic education for home making. It is resultant of technological and scientific advances as well as socio-economic changes in the modern society. It has been an answer to the challenges and problems resultant of technological and scientific advances.

Home Science Education unifies the basic principles from various arts and sciences for application to every day home living in the modern times. Through this, the discipline wants to develop among its students techniques and skills useful for home making. It personalizes instructions, keeping in mind a deep concern for individual home.

6.2 Reasons for Study

These very characteristics of Home Science Education make it unique from other disciplines. These are also the conditions which call for use of many general as well as special methods of teaching. The conditions which are conducive to use of PLM in Home Science Education are :

Explosion in Knowledge :

As cited earlier this discipline that is Home Science combines many basic principles from arts and sciences. Increase of knowledge and information in basic arts and sciences leads to increase in knowledge and information to be acquired by Home Science students. Thus, there is an explosion in 'knowledge' and 'information' to be acquired by home science students at all levels of education.

Explosion in Student Population : In recent years there has been a steady increase in institutions offering home science as a subject as a stream as well as a special academic field of study at various levels of education. The recent figures available for student population at higher educational level itself reveals a very rapid increase in population. As quoted by one of the eminent home scientists at the workshop on population education at Faculty of Home Science, Baroda, the turnover of Home Science students from 133 institutions of higher education itself is about 40,000. One can well imagine the number of students at high school and higher secondary school level. Every year more and more schools are offering home science and more and more students are opting for home science.

Availability of Resources :

More and more technological and scientific advances are offering various equipments and materials for use in promoting education. The very characteristics of home science which advocates personalising instruction gives enough scope for use of technology in terms of machines as well as orderly procedures in promoting home science education.

These three conditions which justify use of PLM in other areas of education also justify its use in home science education. In fact use of technology in home science education in terms of programmed learning material is still unexplored.

Studies conducted in U.S.A. to establish suitability of PLM for promoting Home Economics Education leads to conclude that both forms of PLMs can be developed for use of students with varying abilities having different personal characteristics. Use of PLM is also found to be suitable in formal educational programmes at school and college level as well as in informal educational programmes like Home Making, Consumer and Adult Education Programmes. Its use is found to have suited both the types of learners - the normal as well as the disabled.

The very first study conducted on use of PLM in Home Economics ruled out the basic criticism against its use that is it cannot be used for transfer of higher levels of learning. Johnson and others (1960) proved that it can help develop understanding to transfer the skill in clothing construction. Hence an investigation to establish the suitability of PLM was thought of as an important contribution in the field of Home Science Education. The experimental study to test the suitability of linear form of programmed material on 'Saving' for use as a self study method as well as an aid was, therefore, undertaken. Its suitability compared to the conventional method of teaching was also to be established independently as well as in combination with the selected personality characteristics.

6.3. Objectives

The present investigation thus, aimed at :

* Selecting appropriate concepts, generalizations and objectives for developing PLM on 'SAVINGS' .
* Organizing content for linear form of PLM on 'SAVING'.

* Validating the development of linear form of PLM through individual and group testing.

* Developing and validating a linear form of PLM in home science for selected adolescent girls opting for home science.

* Studying the suitability of linear form of PLM in home science as self instructional and aided methods of study for selected adolescent girls opting for home science.

* Studying the effectiveness of linear form of PLM in home science over selected conventional methods of study when used as self instructional and aided method of study, and

* Establishing suitability of linear form of PLM in home science for selected adolescent girls varying on the basis of selected input variables such as intelligence, overall achievement, achievement in Home Science, Socio-economic status, extent of preparation, time taken to go through the PLM and adjustment to the school.

6.4 Hypotheses

It was conducted to test three main hypotheses namely,

1. There will be no significant differences in the IRT and DRT scores on the basis of the methods of treatment irrespective of any personality variables.
2. There will be no significant differences in the IRT and DRT scores of students due to their level of intelligence, overall class achievement, achievement in Home Science, extent of preparation adjustment to school, socio-economic status and time taken to go through the PLM.

3. There will be no significant difference in the scores of the students on the objective and subjective items of the immediate and delayed retention test on the basis of their level of intelligence and time taken to go through the PLM.

6.5 Research Design

The design of the study was experimental in nature involving 135 students of five divisions of IXth class from Maharani High School for Girls opting for home science. It was a purposive sample having 45 students each. Constantly present under each of the three experimental conditions namely conventional method of study using lecture-cum-discussion, PLM for self study and PLM as an aid to lecture method.

6.6 Variables under Study

The variables considered in this study were intelligence classified in three categories on the basis of scores on Desai-Bhatt intelligence test. The overall class achievement scores and scores on achievement in Home Science were taken from the cumulative record cards of the previous year that is VIIIth. They were classified in three categories on the basis of mean and standard deviation. For judging the extent of preparation for entering the experimental conditions scores on pretest were considered and categorized in three categories according to mean and standard deviation. The SES was arrived at on the basis of the points earned on the Inventory prepared by investigator and categorized according to the various ranges of these points. Time taken was categorized in two on the basis of median time taken by the group of adolescent girls under study.

Suitability of PLM in home science was established on the basis of three major steps, namely

* selection of concepts, generalizations and objectives on the basis of expert advise and judgment and analyzing the contents in orderly manner.

* Individual and group testing of frames and field-testing on the selected students under the three experimental conditions independently as well as in combination with selected personality variables on the basis of overall immediate as well as delayed retention test scores and those on the subjective and objective items of these tests in relation to only two selected personality variables namely intelligence and time taken to go through the PLM.

The PLM thus prepared established that it is possible to develop a linear form of PLM through the use of the above procedures.

6.7 Methods and Analysis of Data

Data were collected in terms of immediate and delayed retention tests given on completion of each sub unit as well as whole unit respectively. The scores achieved on these two were used to judge suitability of the experimental methods.

The data were thus analysed in terms of frequency and percentage for studying their personal characteristics. Mean, median and standard deviations were used for categorising the selected variables. Mean and 'F' value for simple and two way analysis of variance was computed to study the variations on IRT and DRT scores in general and specially in subjective and objective items under the three methods of study independently as well as when combined with the selected variables.

6.8 The Major findings

The major findings revealed as per the following :

6.8.1 Characteristics :

In case of all the variables the sample under study represented the middle category. It revealed that most of the students belonged to above average level of intelligence, having moderate preparations to enter the experimental conditions, represented above average. Overall class achievement and moderate achievement in Home Science as a subject. Majority of these students were well adjusted to the school. Almost equal number of students were found to be divided in the categories of those taking more time and those taking less time.

6.8.2 Suitability of PLM Independently :

The overall findings of the present investigation concerning suitability of experimental method alone provide enough evidence to conclude that PLM is suitable for promoting

Home Science education for adolescent girls.

In general it is most suitable as a self study method. However, its use as an aid to conventional method of study is more suitable for immediate retention whereas its use for self study helped in achieving more on delayed retention.

6.8.3 The study further indicated that use of PLM was more suitable when compared to conventional method of study namely the lecture-cum-discussion as far as present study is concerned.

Its use as an aid to conventional method was found to be superior to conventional method of study alone as far as immediate retention was concerned.

Its use for self study was more suitable than the conventional method of study for delayed retention.

6.8.4 Variations in Immediate Retention Test Scores due to Personality Variables :

Intelligences - Overall class achievement as well as achievement in Home Science and time taken to go through PLM were found to be responsible for variations in IRT scores.

Extent of Preparation and Adjustment to School combined with methods of study were found to be responsible for variations in the IRT scores. SES was not found to be affecting independently as well as when combined the variations on IRT scores.

6.8.5 Variations in Delayed Retention Test Scores due to Personality Variables

Methods of study independently affected the DRT scores when the analysis of data were done controlling the scores according to extent of preparation and adjustment to school as well as SES.

As far as intelligence, overall class achievement and achievement in Home Science were concerned their independent as well as combined effect with methods of study was found to be responsible for the variations in DRT scores. In case of time taken, the independent effect of time and methods of study as well as their combined effect did not influence the variations in the DRT scores.

6.8.6 Variations in Scores on Subjective Items of IRT and DRT due to Intelligence and Time Taken

Time taken to go through the PLM independently affected the variations in the DRT scores on subjective items significantly. Methods of study alone or when combined with time taken did not have any effect on these variations. Intelligence and methods of study too did not affect the variations in scores on subjective items independently as well as when combined.

As for DRT scores on subjective items both intelligence and methods of study independently affected the variations of scores significantly. As for time taken both the time as well as methods of study independently or when combined did not affect the variations.

6.8.7 Variations in Scores on Objective Items of IRT and DRT due to Intelligence and Time Taken

The scores on objective items of IRT varied significantly due to methods of study independently when they were controlled by time taken. However, time taken independently as well as when combined did not affect the variations.

The scores on objective items of DRT did not vary significantly due to time taken and methods of study independently as well as when combined.

As for the variations in the scores of objective items of IRT methods of study independently affected these variations when controlled according to level of intelligence. However, intelligence alone and in combination with methods of study did not affect these variations significantly.

As for variations in the scores of objective items on the basis of DRT it was found that intelligence alone affected these variations and methods of study independently as well as when combined with intelligence did not have any effect on these variations.

Time Taken

The students taking more time achieved better than those taking less time. PLM for self study was found to be more suitable than its use as an aid.

USE OF PLM for self study was found to be more suitable to those who took more time to go through it. Those taking less time to go through the experiment found use of PLM as an aid more suitable as far as IRT scores were concerned.

6.8.9 Suitability of PLM for Self Study as well as an Aid For Delayed Retention in Relation to Selected Variables

Intelligence :

In case of intelligence a positive relationship was revealed between three levels of intelligence and achievement scores on DRT. In case of methods of study use of PLM as an

Achievement in Home Science

On the whole there was a positive relationship between achievement in Home Science and achievement on IRT as indicated by increase in achievement scores on IRT with increase in the level of achievement in Home Science.

PLM for self study was found to be most suitable followed by its use as an aid as far as IRT scores were concerned.

For high and medium achievers in Home Science use of PLM for self study was found to be most suitable. For medium and low achievers. Use of PLM as an aid was equally suitable when compared to conventional method as far as IRT scores were concerned.

Extent of Preparation

There was an indication of positive relationship between levels of preparations and achievement scores on IRT. The later increased with the increasing levels of the former. Use of PLM for self study was found to be most suitable followed by its use as an aid as far as IRT scores were concerned.

Use of PLM for self study was found to be most suitable for well prepared students followed by its use as an aid. The least prepared students found use of PLM as an aid most suitable. On the other hand least prepared students found use of PLM for self study least suitable.

Socio-Economic Status

The students belonging to high middle SES achieved the highest mean scores on IRT. Use of PLM for self study was found to be most suitable than its use as an aid. Its use as an aid was found to be more suitable than the use of conventional method alone.

Use of PLM for self study was most suitable for students from high and middle SES, in that those from high SES achieved better than those from middle SES.

Its use as an aid was found to be more suitable for those from middle SES than from higher SES. Its use as an aid was not found to be suitable to those in lower SES - as far as IRT scores were concerned.

Adjustment to School

Well adjusted students scored better than the less adjusted students. Use of PLM for self study was found to be more suitable than its use as an aid. In that well adjusted students found use of PLM for self study more suitable whereas the less adjusted students found use of PLM as an aid more suitable as far as IRT scores were concerned.

Time Taken

The students taking more time achieved better than those taking less time. PLM for self study was found to be more suitable than its use as an aid.

USE OF PLM for self study was found to be more suitable to those who took more time to go through it. Those taking less time to go through the experiment found use of PLM as an aid more suitable as far as IRT scores were concerned.

6.8.9 Suitability of PLM for Self Study as well as an Aid For Delayed Retention in Relation to Selected Variables

Intelligence :

In case of intelligence a positive relationship was revealed between three levels of intelligence and achievement scores on DRT. In case of methods of study use of PLM as an aid was found to be more suitable than its use for self study.

PLM as an aid was found to be most suitable for both above average and average students. Its use as an aid by average students resulted in the highest mean when combined effect of intelligence and methods of study was studied indicating it as the most suitable method for delayed retention as far as average students are concerned.

<u>Overall Class Achievement :</u>

There was a positive relationship between overall class achievement and achievement scores on DRT. Use of PLM as an aid was found to be more suitable than its use for self study as far as DRT were concerned.

The combined effect of method and overall class achievement revealed that use of PLM for self study was most suitable for high achievers and its use as an aid was most suitable for low achievers, as far as DRT scores were concerned.

<u>Achievement in Home Science :</u>

The high achievers in Home Science scored better than the medium and the low achievers. However the low achievers in Home Science scored better than the medium achievers as far as DRT scores were concerned.

Use of PLM as an aid was more suitable than its use for self study as evidenced from the DRT scores.

Use of PLM for self study was found to be most suitable by the high achievers. The medium and low achievers found use of PLM as an aid more suitable than its use for self study.

Extent of Preparations :

There was a positive relation between levels of preparation and achievement on DRT. Use of PLM for self study was found to be less suitable as compared to its use as an aid in case of DRT scores.

PLM as an aid was found to be more suitable for students who were least prepared. It was found to be more suitable as an aid than its use for self study for well prepared students too.

Socio-Economic Status :

The trend of achievement scores on DRT indicated that lower the SES higher was the achievement score.

Use of PLM as an aid was more suitable than its use for self study. The students belonging to high middle SES found use of PLM for self study as well as an aid most suitable equally.

As for students from middle middle SES its use as an aid was more suitable whereas for students from low middle SES its use for self study was suitable.

Adjustment to School :

The well adjusted students scored better than the less adjusted students. The use of PLM as an aid was found to be more suitable than its use for self study. Well adjusted students found use of PLM for self study more suitable, whereas its use as an aid was more suitable to less adjusted students as far as DRT scores were concerned.

Time Taken :

Those taking more time achieved more than those taking less time. Use of PLM as an aid was found to be more suitable than its use for self study. Both the groups, that is those taking more time and those taking less time, found its use as an aid more suitable. In fact those taking less ~~tha~~ time scored little more than the scores obtained by those taking more time and using PLM for self study in case of DRT.

6.8.10. Suitability of PLM for Self Study as well as an Aid for Scoring on Subjective and Objective Items of IRT as well as DRT according to Intelligence and Time Taken

Intelligence significantly affected only the DRT scores on subjective items independently. The highest average scores on subjective items was found to be for extraordinary students. The above average students had higher average mean score than the average students.

Those using PLM as an aid scored highest average mean on subjective items as far as IRT was concerned. In case of DRT scores,

† those using it as an aid found it more suitable than its use for self study.

In case of variation in scores on objective items on IRT and DRT methods of study significantly affected the variations on IRT independently whereas intelligence independently affected these variations on DRT scores. Use of PLM as an aid was found to be more suitable than its use for self study.

Time taken significantly affected the sample under study independently. It also affected the variation

S in subjective items on IRT. Students taking more time more scored on subjective items on IRT. Those using PLM as an aid were more benefited.

Methods of study independently affected variations in objective items of IRT. Time taken had no effect on this variations. However, interestingly enough the data revealed that students taking less time achieved better on objective items than those taking more time. Use of PLM as an aid was found to be more suitable.

Time taken and methods of study did not affect variations on subjective items scores on DRT. Those taking more time scored higher average mean. Use of PLM for self study was more suitable than its use as an aid in case of scores on subjective items of DRT.

Those taking more as well as less time found its use for self study better. Those taking less time were equally benefitted by its use as an aid.

Time taken and methods of study did not affect DRT scores on objective items significantly. Those taking more time achieved better. Use of PLM as an aid was found to be more suitable in general. Those using it for self study scored higher mean in less time.

6.9 Limitations of the Present Investigation

Experimental Conditions :

As Cass (1968) pointed out one of the main limitations of this study was insufficient experimental control. The study continued for over four weeks. Each group of students met only twice in a week for the experiment. Other factors like extra or co-curricular activities, test and assignments in other courses, long stretch of time in between use of PLM probably has had an effect on their performance as a result of experimental conditions.

Though the characteristics of the adolescent girls under study revealed that majority of them belonged to an average group according to their level of intelligence, overall achievement, achievement in Home Science, and extent of preparations, for which well recognized tools were used, their distribution on SES and adjustment to school is limited only to the use of descrition power of the investigator. Standardized tools for these could have been used in order to contribute more from this point of view.

There was absolutely no control over their previous experiences or aptitudes towards PLM as no attempt was made to find out whether they had observed or gone through any previous experiences as far as PLM was concerned.

It was only assumed on the basis of information verbally available that they never had an opportunity to use PLM earlier.

A sample was large enough to limit the investigator's judgment of individual learning. However on the basis of the inferences drawn through group testing all possible care was taken to meet the requirements of majority of students.

It had one plus point in that the testing of PLM - during development stage as well as field testing - was done in real classroom situation, absence of which is considered as a limitation of such studies. However this point out one limitation of use of PLM. That is, how much of the content presented in PLM can be studied in a given class period time needs to be judged, PLM needs to be prepared in parts to be completed within this time limit so as to exactly study the effect of time as a factor affecting learning - immediate as well as delayed - with the use of PLM.

No rationale behind assignment of the treatment was used. It was just simple randomization.

In case of sample and sampling method purposive accidental sample too has been one of the limitations of study. More randomized equally distributed sample on the basis of treatment as well as the personality variables could have yielded better results leading to more specific generalizations. In order to study the combined effect of intelligence and time taken on IRT as well as DRT scores their effect under each method could have been studied as it could have given indication in support or otherwise regarding use of PLM by extraordinary students to score more in lesser time when it is used in either of the two ways experimented with.

The evaluative tests for immediate retention on sub-units as well as a unit test for delayed retention should have had items with equal weightage for both subjective as well as objective items on these tests. However, this was taken care of by working out percentile equivalence for comparatibility of these scores.

Tool Preparation and Validation

In case of preparation of linear form of PLM on savings more prompts and cues should have been used to reinforce learning. Use of these could have facilitated better understanding of procedures involved and types of savings. This is turn could have resulted in better achievement on subjective items, on which the overall performance was found to be very low.

The prompts could have been in terms of specimen examples of cheques, withdrawal and credit forms, format of debenture or various forms of National Saving Schemes such as Bonds, Certificates etc. Auxillary aids could have been used, as reproduction of some of these specimen was legally forbidden to substitute for these prompts.

More time for validation of frames through individual and group testing should have been given in order to prepare a better PLM. The analysis for validation of the frames should have been done on more sound statistical means rather than just frequency and percentage basis.

However, with all these limitations since some of them are inherent part of studies on programmed learning material a beginning has been made in establishing its suitability in Home Science Education for adolescent girls which by itself is a contribution in the padagogical studies which are limited in this area. The study has indicated some trend towards suitability of PLM for self study as well as an aid in Home Science for adolescent girls in general as well as for those varying due to selected personality variables in particular.

6.10 Recommendations

It is recommended on the basis of the findings as well as the limitations cited regarding the present investigation that a careful revision of each frame from each sub-unit be done providing for suitable 'prompts' and 'Cues' for promoting better understanding.

The carefully revised PLM should be validated with use of sound statistical procedures carried out for both group as well as field testing.

A study for its use for various purposes namely auto study, aid, and remedial be tried out independently as well as comparatively for these three purposes as well as over other selected conventional methods irrespective of personality variables be carried out.

Programmed learning Materials in areas of Home Science where one needs to develop understanding for transfer of skill be developed and tested not only for use under formal educational programmes but also for informal and non-formal educational situations. This will contribute to spreading knowledge regarding various aspects of home making to the educated home makers trained as well as untrained in home making education through continuing and adult education programmes of our country.

The two different forms of PLMs namely the hybrid and the branching type be developed in the same area in which the present investigation is conducted as the concept, generalizations and objectives for its use are already developed to test the independent suitability of each of this type to meet the stated objectives and also to study the comparative effectiveness of each of these three forms.

To overcome the limitation of influence of previous related learning through conventional method the whole portion prescribed under Home Science for a given level of education be programmed to test its suitability over conventional type of learning. This will also provide an additional resource material.

Overall Conclusion

The investigator concludes from the findings of the study as well as the feelings it has generated that developing a PLM material in Home Science is feasible and its use in promoting Home Science Education is possible. It is found to be suitable for use by adolescent girls. Its use both for self study as well as an aid is suitable in general. In particular its use as an aid is more suitable for immediate retention and its use for self study is suitable for delayed retention.

The students with high and medium level of intelligence and achievement find it more suitable for self study. Those having comparatively low level of intelligence and achievement find it suitable as an aid. For those who are well prepared and well adjusted representing high SES find its use for self study more suitable whereas those who are less prepared and less adjusted and represent middle and low SES find its use as an aid more suitable.

Its use for self study is found more suitable by both who take more as well as less time. Those taking less time are benefited more by its use as an aid.

Intelligence and time taken affect achievement on subjective and objective items do does the methods of study. In that, those using it for self study find it more suitable in terms of responding to subjective items whereas those using it as an aid do better on objective items.

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