TO DEVELOP AND USE PROGRAMMED LEARNING LESSONS IN F. Y.B.SC. PHYSICS STUDENTS AND TO VERIFY EFFICACY OF THOSE LESSONS

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Abstract :

The present research study aimed at the supplying of reliable proofs for establishing the effectiveness of the Programmed learning for the subject, Physics. Therefore the focus of the research study was the relationships between the two variables viz. content knowledge acquisition in Physics, and the method of learning.

The Post test-only, Equivalent Group Design was used because it has advantages such as use of randomization, control of the group and exposure to treatment.

The study has been conducted on two divisions of F.Y.B.Sc.each containing 50 students were to be designated as the control group and experimental group.

In this research study the statistical measures such as Mean, Standard Deviation were computed and the statistical significance of the difference between the two means was tested by using t-test.

Key Words : Develop and Use Programmed, Verify Efficacy

Introduction :

School is a Social institution. It is an ideal epitome of human society. Teaching and learning are its immediate goals. It paves the way for development of student's personality. But ultimately it functions for the welfare of the society.

The education and its process have been progressing and developing by leaps and bounds. Different Indian and Western thinkers have put in their contributions in the field of aims, practices and evaluation. Therefore, improvement in education is an on-going process.

Significance of the Research Study :

This present study has significance of its own because of its uniqueness and utility for the days to come. It is related to educational technology. It is more precisely related to Programmed learning. It has undertaken to tryout and ascertains the effectiveness of the Programmed lessons which the research worker had developed through his own efforts.

It is an applicational study. It has put to use the technique of programmed learning for the F.Y.B.Sc. Physics and its teaching and learning.

The F.Y.B.Sc. Students are the real and direct beneficiaries of present research study. They have a unique aid for the study of Physics. It would promote their self-study capacity.

Objectives of the Study :

The present research study has the following objectives.

1) To develop the linear programmes according to the programmed learning technique for the Self- study of the unit 'Magnetism' from F.Y.B.Sc. Physics.
2) To supply those linear programmes to students for self-study.
3) To study the efficacy of linear programmes by using a relevant achievement test.

Hypotheses :

1) There is no significant difference between the mean scores on the achievement test in magnetism administered to female students of the control group and the experimental group.
2) There is no significant difference between the mean scores on the achievement test in magnetism administered to male students of the control group and the experimental group.
3) There is no significant difference between the mean scores on the achievement test in magnetism administered to the control group students and the experimental group students.

Design of the Study/ Research methodology :

The present study is an experimental research. It was proper to use experimental method because it was more concerned with variable relationships. i.e. relationships between programmed lessons and students achievement.

There are numerous experimental designs. The Post test-only, Equivalent Group Design was used in this experimental research.

Sample :

The students in the divisions of F.Y.B. Sc. of Senior College constitute the target population. A sample is the representative portions of the population. The two divisions selected by the researcher constitute the sample of the study.

A simple lottery method of probability sampling method was used to select the two divisions and to ascertain the control group and the experimental group. This random sampling was a must for the Post test-only, Equivalent Groups Design. There are 50 Students in each group.

Table -1 : Details of Control and Experimental Groups :

Sr. No.	Groups	Females	Males	Total
1	Control Group	23	27	50
2	Experimental Group	26	24	50
Total		49	51	100

Research Variables :

Table -2 : Research Variables :

Sr. No.	Group	Independent Variable	Dependent Variable
1	Experimental	Self-study through linear Programmed lessons (Experimental input)	Academic achievement in Physics
2	Control	Use of Lecture method i.e. Lack of experimental input.	Academic achievement in Physics

Tools used for the Study :

1) The programmed lessons 2) The achievement test

These tools were developed by the research worker himself.

Statistical Techniques used :

1) Mean 2) Standard Deviation

3) t - Value for testing statistical significance of the difference between two means.

Analysis of the Study

Table-3: Data for Testing the Statistical Significance of the Difference between the Two Means of the Scores procured by the Female Students

No	Details	Experimental Group	Control Group	t-value	Level of significance
1	Mean	32.80	16.50	15.38	0.05
2	Standard Deviation	5.80	4.75		
3	Total Subjects	50	50		

The ideal t-value at 0.05 level of significance is 1.96

The calculated t-value is 15.38

The calculated t-value 15.38 exceeds the ideal t-value 1.96

Therefore, the difference between the mean scores of the female students mobilized in the control group and the experimental group is statistically significant.

Table-4: Data for Testing the Statistical Significance of the Difference between the Two Means of the Scores procured by the Male Students

No	Details	Experimental Group	Control Group	t-Value	Level of significance
1	Mean	32.60	20.60	10.62	0.05
2	Standard Deviation	5.95	5.35		
3	Total Subjects	50	50		

The ideal t-value at 0.05 level of significance is 1.96

The calculated t-value is 10.62

The calculated t-value 10.62 exceeds the ideal t-value 1.96

Therefore, the difference between the mean scores of the male students mobilized in the control group and the experimental group is statistically significant.

Table-5: Data for Testing the Statistical Significance of the Difference between the Two Means of the Scores of the Control Group and the Experimental Group

No	Details	Experimental Group	Control Group	t-Value	Level of significance
1	Mean	32.60	18.70	12.28	0.05
2	Standard Deviation	5.95	5.50		
3	Total Subjects	50	50		

The ideal t-value at 0.05 level of significance is 1.96

The calculated t-value is 12.28

The calculated t-value 12.28 is greater than the ideal t-value 1.96

Therefore, the difference between the mean scores of the total experimental group and the control group is statistically significant.

Conclusions :

Hypothesis 1 :

There is no significant difference between the mean scores on the achievement test in magnetism administered to female students of the control group and the experimental group.

According to table -3, the difference between the mean scores of the female students mobilized in the control group and experimental group is 16.30 and its t-value is 15.38. The calculated t-value, 15.38 is greater than the ideal t-value 1.96 at 0.05 level of significance.

Therefore, the difference between the two means is significant and real.

Therefore - 1) the null hypothesis-1, that is given above is rejected, and

2) the modified hypothesis, 'there exists significant difference between the mean scores on the achievement test in magnetism administered to female students of the control group and the experimental group' is accepted.

It is hereby concluded that since the female students of the experimental group had used the programmed lessons for their study, they could have significant achievement in content learning and post testing.

Hypothesis 2:

There is no significant difference between the mean scores on the achievement test in magnetism administered to male students of the control group and the experimental group.

According to table - 4, the difference between the mean scores of the male students mobilized in the control group and experimental group is 12 and its t-value is 10.62. The calculated t-value, 10.62 is greater than the ideal t-value 1.96 at 0.05 level of significance.

Therefore, the difference between the two means is significant and real

Therefore -

1) the null hypothesis-2, that is given above is rejected, and

2) the modified hypothesis, 'there exists significant difference between the mean scores on the achievement test in magnetism administered to the male students of the control group and the experimental group' is accepted.

Therefore, it is hereby asserted that their performance in the post test was superior to the performance of the male students in the control group. This significant performance and achievement can be attributed to the use of programmed lessons.

Hypothesis 3:

There is no significant difference between the mean scores on the achievement test in magnetism administered to the control group students and the experimental group students.

According to table- 5, the difference between the mean scores of the total control group and the experimental group is 14 and its t-value is 12.28. The calculated t-value, 12.28 is greater than the ideal t-value 1.96 at 0.05 level of significance.

Therefore, the difference between the two means is significant and real

Therefore -

1) the null hypothesis-3, that is given above is rejected, and

2) the modified hypothesis, 'there exists significant difference between the mean scores on the achievement test in magnetism administered to the control group students and the experimental group students' is accepted.

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