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FINAL STUDY AND INSTRUMENTATION

56   CHAPTER   IV

FINAL STUDY AND INSTRUMENTATION

4.1   Introduction

The previous chapter was about the try out study.
The results of the try out study showed that the programme
forms were suitable for the present population under investi-
gation.   Therefore all the four forms were used for the
experiment as they were. The present chapter deals with the
final study and instrumentation.

4.2   Sample

As stated in the third chapter the population under
investigation consisted of the eighth standard students
studying in English medium schools of Baroda. For the main
study, therefore, three schools from amongst those with
English as medium of instruction were randomly selected.
These were the Shreyas School, the Convent of Jesus and
Mary, and the Baroda High School. All the 301 students of
eighth standard in these schools constituted the sample.
The students from each school were randomly divided into
four groups by using the table of random numbers. In each
group, there were seventyfive students except in one where
there were seventysix students. Instructions arranged
through the four forms of programme were considered for

57   treatments. These treatments were assigned to the four groups of students randomly. The table 4.1 shows the treatmentwise distribution of sample.

Table 4.1 : Treatmentwise distribution of sample

School	Treatments				Total
	Linear Overt	Branching form	Skip programme	Response prompt	
	N	N	N	N	
Shreyas	18	20	19	18	75
Convent of Jesus and Mary	30	27	29	29	115
Baroda High School	28	28	27	28	111
Total	76	75	75	75	301

4.3   Design of the study

As mentioned in the first chapter, one of the main aims was to study the relative effectiveness of the four forms of the programme. It was necessary to have four groups to achieve this objective. Therefore, as mentioned earlier in this chapter the students in each school were divided into four equal groups by using the table of random numbers and further each group was randomly assigned to one of the programme forms. The same procedure was followed in all the

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schools. The technical name of this design is random replication.

4.4 Tools employed in the study

The second major objective of this investigation was to study the relationships between certain personality variables and academic achievement of the students through the use of different forms of programme. The personality variables selected for this study were academic motivation, adjustment, dependency, reading comprehension and attitude towards programmed learning as an instructional technique. The tools used for the measurement of these variables have been described below.

(1) Academic motivation : Junior Index of Motivation -
     JIM Scale :

Academic motivation is the motivation which relates to learning in an academic setting. In other words it is students motivation towards school. It helps the students to reach towards the goal. If they do not have this motivation, they would not put their heart for work. Academic motivation helps the students to gain the best out of learning. In programmed learning the students perform certain activities. In order to perform these activities, motivation is very much necessary. Logically it can be said that if the students are academically motivated their performance is

59   likely to be better than otherwise. To test this empirically,
this variable was taken up for investigation.

The scale used for measuring academic motivation
was Junior Index of Motivation prepared by Frymer (1970).
It was meant for the pupils of 12+ or older. The age of the
population under investigation was 13+. So it was decided
that this scale would be appropriate to measure the academic
motivation of the pupils under investigation. JIM Scale
is given in appendix 'D'.

JIM Scale consists of eighty agree-disagree items.
But only fifty items are scored. The others are filler
items, but should be included. The operation assumptions
which relate to the nature of the instrument are given below.

(i)   Items were phrased in such a way that they would be
        at least partially project in nature.

(ii)   Many items were also phrased with a value hierarchy
        readily apparent. This technique was designed to
        require the respondent to make a choice between two
        alternatives. For instance one such item is "Being
        right is more important than being kind". It was
        hoped that such phraseology would distill value
        sentiment to an observable surface.

(iii) The response to a particular item in a particular way

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did not indicate a priority direction of students
motivation or its degree.

Tests of reliability of the JIM Scale included
several administrations of the instrument to high school
students. From the split-half correlation studies, it may
be seen that the test items were fairly consistent among
students in high school as the coefficient of correlation
was 0.83.

The scoring of the scale is as follows. First,
prepare a key. Note that all fifty items are scored minus

Next, add each student's score for these fifty
items algebraically. Then reverse the sign (if, it is +27,
say change it to -27. If it is -16 then change it to +16),
and add this raw score value to +100 algebraically. This
score is the students converted motivation score. Higher
scores indicate higher motivation level. Lower scores
indicate lower motivation level.

(2) Adjustment : Pre-Adolescent Adjustment Scale (PAAS)

Adjustment is defined as the individual's orienta-
tion towards his parents, teachers, peers, school and himself
in terms of satisfaction he derives from his interactional
relationship with these significant others and himself. The
ordinary class room consists of high, average and low

61 adjusted pupils. If the teacher teaches fast, some of the students may not follow the teacher. But in programmed learning since self-pacing is possible the students learn according to their own speed. Students' low adjustment towards parents, peers, school and himself may affect their performance negatively. In order to study the effect of adjustment on learning outcomes through various forms of programming, one of the variables included for the present investigation is that of adjustment.

In order to measure the adjustment of the students, Pre-Adolescent Adjustment Scale was used. It was prepared by Udai Pareek and others (1970). Thurstone's method of equal appearing intervals was followed in the construction of PAAS. The scale consists of forty items : home (9), school (8), teachers (8), peers (8) and general (7). For each type of adjustment the scoring is separate. The scale has been validated against the ratings by the teachers from five schools. Mann-Whitney U-values were calculated for each area of adjustment for each of the five schools. The levels of significance are mentioned in the table 4.2

Table 4.2 : Levels of significance of U-values for the validity of PAAS Subscales

Schools	Home	School	Peers	Teachers	General	Total
A		.001				.01
B	.206		.028			
C					.100	.100
D	.008				.028	.05

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For reliability of the scale, retest data were obtained from five middle schools, with a gap of three months between test and retest. Product moment correlations are given in the table 4.3

Table 4.3 :   Test-Retest reliability coefficient of PAAS

School	A	B	C	D	E
Sub-scales	N = 27	N = 18	N = 12	N = 21	N = 22
Home	-.05	-.04	-.07	.20	.46
School	.53	-.22	.08	.603	.498
Peers	.204	.36	.18	.49	.54
Teachers	.084	.278	-.12	.23	.278
General	.397	.389	.25	.44	.278

The score of an individual in any area of adjustment is the sum total of the scale values of the items checked by him falling under that area. The score may be negative or positive, a negative score indicating maladjustment and a positive score indicating good adjustment, depending on the magnitude of the score. The scale is given in appendix 'E'.

(3)   Dependency : Pre-Adolescent Dependency Scale (PADS)

Here, dependency was defined as "the tendency to seek the help of others in making decisions or in carrying

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out difficult actions". The level of dependency differ from student to student. An ordinary class-room consists of all these different types of students. In programmed learning the students work independently. They have to make decisions of their own when they write the responses. If they are not able to make decisions, it may be difficult for them to proceed further. Therefore, to study the relationship between dependency and achievement of the students in programmed learning this variable has been taken up for the study.

To measure the dependency of the students, pre-adolescent dependency scale was used. It was prepared by Udai Pareek et al. (1970). There were two parallel forms. Ten items were there in each of the two forms of PADS. In the present investigation Form A is used to measure dependency. For establishing reliability PADS (Form B) was readministered in four schools after an interval of 14 weeks. The table 4.4 gives the test-retest reliability coefficients.

Table 4.4 : Test-retest reliability coefficients

School	Test-retest (N)	Coefficients
A	23	.067
B	8	.518
C	9	-.06
D	24	.43

64   PADS (Form A) uses a three point scoring system.

All items have equal weights and each item is self checked

for its characteristic description of the respondent's

behaviour (mostly, sometimes, rarely). Scores 2, 1 and 0

are given to mostly, sometimes, and rarely respectively for

dependency items and to rarely, sometimes and mostly

respectively for independence items. The total of all the

scores on the test gives the dependency score for the

individual. The PADS is given in appendix 'F'.

(4) Reading Comprehension Test

    In programmed learning the students have to read

and understand the materials presented to them. It is

obvious that if they can comprehend it, then only learning

will take place. If they cannot comprehend it, they may not

learn anything. So the variable reading comprehension is

very vital in programmed learning.

    A test prepared by Singh (1972) was used as a

measure of reading comprehension in the present investigation.

This is a teacher-made test in English meant for the pupils

of 12+ to 14+ who have studied English for atleast four years.

This test consists of a passage followed by thirteen multiple

choice questions. The students have to answer the questions

after reading the passage carefully. There are four alter-

natives for each question out of which the students have to

select the appropriate one.

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This test consists of thirteen questions. Each of
them carries one score. Hence, the total score for the
reading comprehension test is thirteen. The test is given
in appendix 'G'.

(5) Attitude Scale

It is a general hunch that positive attitude
increases the rate of learning whereas negative attitude
has adverse effect on learning. Therefore in the present
investigation attitude towards programmed learning has been
taken up as a variable.

The attitude scale was used to measure the
attitude of the students towards programmed learning. The
method adopted for the preparation of the scale was
Thurstone's method of equal appearing intervals. It was
prepared by Govinda (1976). The scale was meant for the
B.Ed. students who learned a course through programmed
learning. The stability of the scale was established by
test retest method with a gap of three months. The ζ was
0.38 which was positive and significant.

The investigator used the above scale for measuring
the attitude of the students towards programmed learning for
the sample under investigation. Before it was used, it was
necessary to establish the reliability of the scale for the
sample under investigation because it was meant for a

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different population. For establishing the reliability the scale was administered to forty eight students of eighth standard from the Rosary High School of Baroda. After a gap of ten days the scale was administered to the same students. Product moment correlation was calculated. The coefficient of reliability was 0.29 which is positive and significant at 0.05 level. This indicates that the scale is reliable. The scale is given in appendix 'H'.

4.5 Procedure

At first the pretest was administered to all the students which constituted the sample of the present investigation. Then the different programme forms were assigned to the four groups in each school randomly. The students were asked to read the instructions and it was made clear that they understood them. They worked independently and took their own time. The time taken by each student to complete the programme was noted. The posttest was given immediately after the completion of the programme. When all the students completed the posttest, JIM Scale, pre-adolescent adjustment scale, pre-adolescent dependency scale, reading comprehension test and the attitude scale were administered one by one. The instructions for each tool were given separately. The same procedure was replicated in all the schools.

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4.6 Statistical techniques used for
the analysis of data

(1) To study the relative effectiveness of the four forms
of the programme, analysis of variance, followed by
the t-test was used.

(2) To study the difference in mean achievement of the
students when adjusted for their reading comprehension
analysis of covariance was applied.

(3) To study the relationship between certain personality
variables and achievement of the students in programmed
learning, the statistical techniques used were product
moment correlation and partial correlation.

(4) Analysis of variance was applied to study whether there
was any significant difference in the
(a) posttest score
(b) time score
for different levels of dependency.

(5) Analysis of variance was applied to study whether there
was any significant difference in the
(a) posttest score
(b) programme time score
for different types of attitude.

(6) The t-test was applied to test the significance of
the means of

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(a) post test score

(b) programme time score

(c) reading comprehension score

of the males and females.

(7) The t-test was applied totest the significance of the means of

(a) posttest score

(b) programme time score, and

(c) reading comprehension score

for the high and low motivation levels.

(8) The mean attitude score of students on each form was calculated.

(9) In order to know the percentage of students who are having positive, neutral and negative attitude towards programmed learning, percentages were calculated.

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