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C H A P T E R - 4

ANALYSIS AND INTERPRETATION OF THE DATA

4.1 I N T R O D U C T I O N

As mentioned earlier, the final phase in the curriculum process is the coming to the conclusions about the success or failure in the educational enterprise by means of some measurement or assessment of change in behaviour. The task is concerned with the preceding phases, and the evaluation of the operations that were performed in each, like the experiences chosen suitable for attaining the operational goals, effectiveness of the suitable content, and effectiveness of integration of experience of content. Besides this, as mentioned earlier, evaluation of any educational sequence rests upon the difference between initial behaviour and actual outcomes and relations, these bear to intended outcomes. It is obviously a vital phase, because without some quantitative and qualitative comparisons of actual and expected outcomes, it is impossible to know whether objectives have been realised. Evidence that the curriculum is proceeding along appropriate lines must be sought throughout its development rather than at the end. Along these lines, the evaluation of the curriculum is carried out by the process of validation. The validation can be Internal as well as External. In the process of Internal Validation of the curriculum, the attempt is to test how well the curriculum attains the objectives, it is intended to attain. In the process of External Validation, the developed curriculum is examined against certain external indices of reference already evidenced as valid referents. Both the approaches have been employed in the present study. The validation of the curriculum was studied in terms of its effectiveness on the achievement, attitude and the reactions of pupils. Besides studying the effectiveness

of the curriculum, the relationship between i) the socio-economic status and the Family Adjustment of pupils; ii) the Family Adjustment and the self attitude of pupils and iii) the achievement obtained and the attitude formed through the curriculum was studied.

Hence, this chapter is pertained to the effectiveness of the curriculum and the study of relationship between the variables chosen for the study. Keeping in view, the objectives of the study, this chapter is sectioned into Five. The first three sections deal with the effectiveness of the curriculum in terms of achievement, attitude and reactions of pupils; Section Four deals with the descriptive analysis of socio-economic status and the Family adjustment of pupils and Section Five deals with the study of relationship between the variables that are mentioned above.

Section - 1

EFFECTIVENESS OF THE CURRICULUM IN TERMS OF STUDENTS' ACHIEVEMENT ON CRITERION TESTS

As mentioned above, the effectiveness of the curriculum on students' achievement is considered as one of the main criterion to validate the curriculum. The effectiveness of the curriculum on students' achievement is measured in terms of

a) Students' performance on the criterion tests

b) Students' performance on the comprehensive tests.

The analysis in respect of each is presented in a sequence.

4.2 EFFECTIVENESS OF THE CURRICULUM IN TERMS OF ACHIEVEMENT ON CRITERION TESTS

The scores obtained by twenty-six students of the experimental group on each criterion test and on the comprehensive test for the strategy were descriptively analysed by computing percentiles, mean and standard deviation. Such analysis has been carried out for these tests objective-wise, namely,

knowledge, comprehension, application, analysis, skill, attitude
and for the test as a whole. In making the interpretations, the
pass percentage namely 35% has been fixed as the minimum to be
attained and the scores below this have been considered as low
performance. Between 36-50 have been considered as average and
between 60 and 80 as good, and above 80% has been considered to
be an outstanding performance. Before the computation of percen-
tiles, mean and S-D, the scores obtained by the students were con-
verted into percentages. The following description gives a detail-
ed picture of the criterion tests conducted.

TABLE 4·1

4.1   Percentiles, mean and the S.D. Values of the criterion
Tests 1 (Unit 1 & 2) The Biological Self- Male and Female-
Objective-wise and the test as a whole.

Percen-tiles	Know-ledge	Compre-hension	Applica-tion	Skill	Attitude	Total
P_{10}	41.8	6.40	2.77	41.2		42.63
P_{20}	51.5	9.50	5.55	49.5		45.80
P_{30}	54.5	27.00	8.33	55.8		48.90
P_{40}	57.16	32.88	50.12	60.61	56%= 100	51.32
P_{50}	61.0	42.00	51.68	63.40	32%= 66.6	53.60
P_{60}	63.50	50.50	53.25	66.20	12%= 33.3	55.20
P_{70}	66.00	53-5	54.31	68.94		58.12
P_{80}	68.50	57.50	56.37	76.20		62.0
P_{90}	73.00	75.33	57.93	83.25		68.25
MEAN	60.90	39.00	32.00	60.90	81.33	53.72
σ	12.42	22.5	24.00	15.13	23.25	8.50

The data obtained in the Table 4.1 shows the percentiles,
mean and the S.D. Values of the criterion test One. Here the
unit One (Biological self-male) and unit two (biological self-
female) were combined, because it was easier to test the students
on the main concepts like the differences and the similarities
between the male and the female reproductive systems and their

functions. Secondly, time constraint being another reason, it was decided to combine the tests for both the units. As the Table 4.1 shows, under the knowledge objective, 40% of the students have obtained the average; 50% of them have obtained good whereas in the comprehension objective, 40% have performed very low, 40% average and the rest 20% showing good performance. Almost a similar state is observed even under Application objective. Thirty percent of the students have shown poor performance, whereas the rest 70% of the students have shown average performance. The highest attained was only 59.5. Compared to all these objectives, the skill objective and the attitude objective show a better performance of students. Under skill objective, 30% of the students seemed to have obtained average; 50% with good performance and the rest of them seemed to have obtained above 80%. Under the objective Attitude, the scores seemed to have centered around three points only, as the items given for test were very few. Because of this, computation of percentiles was not possible. For this objective, 56% of the students have obtained 100% of the marks; 32% of the students have obtained 66.6% and 12% have obtained 33.33%. These values indicate that 56% of the students show Highly favourable attitude; 32% of them show favourable attitude and 12% of them show an unfavourable attitude. Considering the test as a whole, 70% of the students seemed to have obtained average and whereas the remaining students have shown good performance. Looking to the mean values, except for the objectives like comprehension and application, rest of the objectives show mean values of good performance. The Attitude objective shows the mean value of 81.33 indicating a highly favourable attitude of students towards the items given related to biological aspects of a male and a female. The mean value of the total test indicates an average performance of the students. The dispersion values seem to be ranging from 8.50 to 24.0. The higher dispersion values are due to the spurts observed at certain percentile points under certain objectives. For instance,

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under the objective knowledge, a sudden spurt is observed at
P_{20} and under the objective Comprehension, the spurts were
observed at P_{30}, P_{50}, P_{60} and P_{90}. Under the objective Applica-
tion even , the same condition is observed. Here, the spurt
was observed at percentile point P_{40}. In sum, the performance
of students was found to be just better though not satisfactory,
as the total test shows the mean value of only an average per-
formance. The higher values obtained at certain objectives like
Application and Attitude may be due to the discussion sessions
held, wherein certain commonly held misconceptions, beliefs and
problems related to biological self were discussed. The lower
values obtained at knowledge and comprehension may be due to the
reason that, for the first time, this unit introduced deviated
PLM and this required initiative from pupils for self study which
might not have been forthcoming in adequate measure. One more
reason could be that, certain concepts were taught through in-
quiry method, which might have been quite a new experience to the
students. Besides deviated PLM and inquiry method, certain
other inputs like slide presentations and transparencies were
used. On the whole, the various combinations of instructional
inputs were found to be effective in attaining the objectives,
though not to the fullest satisfaction.

TABLE 4·2

4.2 PERcentiles , mean and the S.D.Values of the Criterion test 2
Objective-wise and the test as a whole. Unit 3,4 and 5(Per-
ception of the other and Building up Relationship)

Percentile/ Objective	Know- ledge	Compre- hension	Applica- tion	Analysis	Attitude	Total
P_{10}	19.2	35.7	32.5	47.0	49.2	51.5
P_{20}	26.0	40.8	40.9	53.5	57.83	59.7
P_{30}	42.5	44.5	46.1	60.0	64.1	61.7
P_{40}	49.0	48.21	54.5	66.5	69.3	63.7
P_{50}	63.83	55.5	72.5	72.5	74.5	65.7
P_{60}	68.2	62.0	77.7	77.7	79.7	67.7
P_{70}	82.5	68.5	86.5	83.5	86.0	69.9
P_{80}	86.83	76.5	93.07	90.0	91.83	75.1
P_{90}	91.83	84.0	96.8	95.3	96.2	80.83
MEAN	60.9	57.5	67.4	71.00	78.5	66.7
S.D.	25.71	16.72	25.53	16.08	16.6	9.99

The data obtained in the Table 4.2 represents the values obtained for the criterion test 2 which includes unit 3, 4 and 5 (Perception of the self-psychological and social, perception of the other and building up relationships). Almost all the objectives except for the comprehension show a better performance of students. Under knowledge, though 20% of the students seem to be below average, the rest of the students have performed better by 20% of the students falling under average , 20% under good performance and the rest 30% under an outstanding performance. Under the comprehension 50% of the students seem to have scored average, 30% good and the rest performing outstandingly. Under Application, the students seem to have performed better. Here 40% of the students have obtained average, 20% good and the rest 30% an outstanding performance. The Analysis and the Attitude objectives also show quite a good performance of students. Under both the objectives, 20% of the students seem to have obtained average, 40% good and the rest 30% an outstanding performance. The test as a whole, shows an average performance for 20% of the students, good performance for 60% of the students and an outstanding performance for 10% of the students. Looking to the mean values, all the objectives except for the comprehension show a mean value of good performance. The test as a whole, even, shows a mean value of good performance. The dispersion value seem to be ranging from 9.99 to 25.71. The high dispersion value 25.71 obtained under the knowledge objective is due to the spurts observed at P_{30}, P_{50} and P_{70}. Under the Application objective even, the spurts were observed at percentile points like P_{20}, P_{50}, P_{70} and P_{80}. In sum, one can say that the students have performed quite well in this criterion test, when compared to first criterion test. This may be due to the instructional inputs used like Exercises, discussions(group as well as individual), dialogue form and deviant PLM.

TABLE 4.3

4.3 Percentiles, mean and the S.D. Values of the criterion test 3
Unit 7, Human Reproduction -(Sex Differenciation and Sex
Discrimination in man)- Objective-wise and the test as a whole

Percentiles/ Objectives	Knowledge	Comprehension	Application	Total
P_{10}	53.5	52.16	47.5	57.5
P_{20}	60.6	56.5	52.64	62.3
P_{30}	66.5	61.6	56.4	65.5
P_{40}	79.9	66.3	60.83	68.8
P_{50}	82.5	71.5	69.5	72.0
P_{60}	85.1	76.7	78.2	75.3
P_{70}	87.7	81.0	82.3	78.3
P_{80}	90.83	84.25	85.5	82.07
P_{90}	99.5	87.5	88.8	85.8
MEAN	77.07	70.7	68.0	71.9
SD	15.5	14.7	16.8	10.09

It is to be noted that the Unit 7 (Human Reproduction)
has been measured by three criterion tests, the values of which
is represented in the Tables 4.3, 4.4 and 4.5. The Table 4.3
shows the percentiles, mean and the S.D. Values of the criterion
test 3. (Sex Differenciation and Sex Discrimination in man) objec-
tive wise and the test as a whole. Looking across the objectives,
one can say that the students have shown a very good performance,
regarding this unit, though 10% of the students under the Know-
ledge, 20% under comprehension and 30% under the Application
objective seem to have obtained average. A good performance is
observed for 30% under Knowledge, for 40% under Comprehension,
for 20% under Application. An outstanding performance is observed
for 50% under the knowledge, 30% under the comprehension objective
and for 30% under the Application objective. The test as a whole
shows a good performance for 60% of the students; an outstanding

the students securing 100% showing an outstanding performance.
In other words, majority of the students have expressed favourable
attitude towards pregnancy and child birth, whereas the remaining
students were more inclined towards unfavourable attitude. Coming
to the knowledge objective, 20% of the students have performed
low; 30% have obtained average; 30% good, whereas the other 20%
have performed outstandingly. The percentiles obtained under
Comprehension objective shows the results as follows. 30% of
the students have shown a good performance; 10% of the students
performing outstandingly whereas the other 30% showing an average.
The remaining 30% have shown a low performance. Unlike the know-
ledge and the comprehension objectives, the Application objective
shows low performance. Almost 50% of the students have shown a
low performance; 30% of them showing average and the rest 20%
showing good and an outstanding performance. Considering the
test as a whole, 50% of them have shown average performance where-
as the 10% of the students have shown low performance. At P_{70}
and P_{80} good performance is observed. Beyond P_{80}, an outstanding
performance is observed. Looking to the mean values, all objec-
tives except the objective attitude show an average performance.
The attitude objective shows the mean value of 79.55. The obser-
ved dispersion values under each objective tend to show a wide
scatter of the scores in the distribution. A few reasons could
be like, under the knowledge objective, the spurts have been
observed at every percentile point. The dispersion value under
Knowledge, comprehension, application and attitude objectives
were found to be higher, because of the low values obtained at
the first few percentile points, like from P_{10} to P_{30} under
comprehension and from P_{10} to P_{50} under Application and Attitude.
The spurts at P_{20} and P_{30} under the Knowledge and the spurts P_{40}
and P_{70} were observed under the objective comprehension. Under
the Objective Application even, the spurts were observed at several
percentile points like P_{40}, P_{70}, P_{80} and P_{90}, which amounts to
large variation.

In sum, here too, the students seemed to have performed
well under the attitude objective, where again, the discussion
session has been used to clarify most of the misconceptions and
the wrong beliefs which students held. This must have been the
reason for the improvement in students' attitude. Though the
transparencies and charts were used to explain certain concepts,
mostly lecture method was used followed by Question-Answer session.
From the values obtained, it seems that the lecture method was
not very effective in attaining the objectives, as the values
show only an average performance and has not reached even 60%.
Besides this, discussion method seemed to have been very effective
in attaining the set objective. The above mentioned figures and
interpretation point out to the effectiveness of various combina-
tions of instructional inputs used to teach the unit, though only
an average performance of students is observed.

TABLE 4.5 Percentiles, mean and the S.D.Values of the criterion
Test 5 Unit 7 Human Reproduction (Pregnancy and Child
Birth) - Objective-wise and the test as a whole

Percentiles/Objectives	Knowledge	Comprehension	Application	Total
P_{10}	60.25	77.8	9.33	62.4
P_{20}	62.25	80.1	14.7	65.64
P_{30}	68.12	96.3	22.0	68.93
P_{40}	70.35	96.7	29.33	72.0
P_{50}	73.5	97.31	36.7	74.9
P_{60}	73.64	97.9	44.0	77.8
P_{70}	75.87	98.6	52.23	80.7
P_{80}	78.75	99.2	69.0	85.3
P_{90}	83.75	99.8	85.74	89.9
MEAN	72.09	95.7	32.61	74.84
S.D.	10.74	8.25	45.70	10.9

The data presented in the Table 4.5 shows the percentiles,
mean and the S.D. Values of the Criterion test 5.(Pregnancy and

Child birth). Under the knowledge objective, most of the students
have shown good and an outstanding performance. 80% of the stu-
dents have shown good performance whereas the other 20% have shown
an outstanding performance. As concerns the Comprehension objec-
tive, 10% of the students have shown good performance whereas
the other 90% of the students have shown an outstanding performance. Coming to the Application objective, 40% of the students
have performed very low, that is, below average; 30% have shown
average; 10% good and the rest 10%, an outstanding performance
with spurts at P_{50}, P_{70}, P_{80} and P_{90} respectively. The total
test performance was not affected by the low performance observed
under the application objective, instead, shows the good performance of 60% of the students and an outstanding performance of
the 40% of the students. Looking to the mean values of Knowledge
and Comprehension, it is obvious that students have performed
good and outstandingly. The mean value of the Application obj-
ective was observed to be below average, showing the low per-
formance. Taking the dispersion values into consideration, the
values obtained under Knowledge and Comprehension are 10.74 and
8.25, indicating not much of variation. But the dispersion
value under Application objective is 45.70 which is more than
the mean obtained, shows the skewed distribution of the scores.
This is because of the low performance obtained by 40% of the
students and on the other side 20% of the students, showing an
outstanding performance. On the whole, from the dispersion value
of the total test, it is concluded that the scores are not highly
dispersed. Looking into the above interpretations, one can say
that the various instructional inputs like visuals, taped commen-
tary, Summary presentation and discussions used to teach the unit
has been effective to some extent.

TABLE 4.6 <u>Percentiles, Mean and the S.D.Values of the Criterion</u>
<u>Test 6 -Unit 8 and 9 (Population Growth and Contraception-</u>
<u>Objective-wise and the test as a whole</u>

Percentiles/ Objectives	Knowledge	Comprehension	Application	Attitude	Total
P_{10}	40.7	47.5	52.7	37.0	52.7
P_{20}	45.9	52.64	57.9	43.5	57.9
P_{30}	51.1	56.4	62.5	50.0	60.9
P_{40}	56.3	60.83	66.83	56.5	62.9
P_{50}	64.5	69.5	71.2	62.75	64.9
P_{60}	68.5	76.0	75.5	69.5	66.9
P_{70}	75.0	81.21	79.8	76.0	68.9
P_{80}	81.5	84.9	83.5	83.2	73.1
P_{90}	88.0	88.64	87.21	91.83	78.3
MEAN	63.75	68.3	69.96	68.08	66.8
S.D.	17.95	17.33	15.60	19.42	9.50

The Table 4.6 represents the percentiles, mean and the
S.D. Values of the Criterion Test 6, where the test items on Units
8 and 9 (Population Growth and Contraception) and population prob-
lem were given combinedly. As the table reads, a good performance
is observed under all objectives, though the values have not
reached an outstanding performance. Under the Knowledge objective,
40% of the students have obtained average; 30% good and the rest
20% of the students, an outstanding performance. At Comprehension
objective, 30% of the students have obtained average; 30% good
and the rest 30% of the students, an outstanding performance.
Compared to Knowledge and Comprehension, students seem to have
performed well at Application objective. Here 20% of the students
have obtained average; 50% good and the rest 20% an outstanding
performance. Considering the Attitude, 40% of the students seem
to have expressed unfavourably; 30% favourable attitude and the
rest 20% towards a highly favourable attitude. Considering the

test as a whole, 20% of the students have obtained average; and the rest 80% have shown a good performance. Looking to mean values, all objectives show the values of good performance, though not an outstanding performance. The dispersion values seem to be ranging from 9.50 to 19.42, wherever the high dispersion value is noticed, the scores have been widely scattered. On the total, the test shows that the students had improved to quite a great extent, in their achievement, though an outstanding performance has not been observed. From the above interpretation, it could be inferred that the instructional inputs like visual-aids, summary presentation and assignments had been effective to quite an extent.

TABLE 4.7 Percentiles, mean and the S.D. Values of the Criterion Test 7- Unit 10 (Venereal Diseases)- Objective-wise and the test as a whole.

Percentiles/ Objectives	Knowledge	Compre- hension	Application	Attitude	Total
P_{10}	40.5	30.64	21.66	50.0	46.0
P_{20}	49.62	32.5	23.83	52.2	51.21
P_{30}	51.25	34.4	31.75	53.5	54.93
P_{40}	52.9	53.5	49.8	60.4	58.64
P_{50}	59.5	61.5	51.64	62.0	61.5
P_{60}	70.1	64.0	53.4	63.63	64.5
P_{70}	72.7	80.6	61.0	71.5	66.7
P_{80}	80.26	81.9	64.3	80.2	69.3
P_{90}	82.33	83.2	80.2	82.33	75.5
MEAN	62.92	59.61	50.5	64.74	58.12
S.D.	17.3	23.65	20.06	14.7	11.8

The data presented in the Table 4.7 represents the percentiles, mean and the S.D. Values of the Criterion Test 7 on the unit, Venereal Diseases. As the table shows, under the Knowledge objective, 50% of the students have obtained average; 20% good and the rest 20% of the students, an outstanding performance. Coming to the Objective Comprehension, 20% of the students

have shown a good performance; 30% an outstanding performance whereas the other 30% seem to have obtained below average. Almost a similar performance is observed under the objective Application, where even, 30% of the students have shown a very poor performance; 30% average; 20% good and the remaining showing an outstanding performance. The Attitude objective shows a favourable attitude for 40% of the students; highly favourable attitude for 20% of the students whereas the remaining 30% of the students seemed to be towards the unfavourable attitude. Considering the test as a whole, an average performance is observed for 40% of the students and a good performance for the remaining students. Looking to mean values, the Knowledge and the Attitude objectives show a mean value of good performance, whereas the objectives Comprehension and Application, and the test as a whole, show mean values of average performance. The dispersion values seem to be ranging from 11.8 to 23.65. The spurts were observed at percentiles points like, P_{60} and P_{80} under the objective Knowledge; P_{40} and P_{70} under the objective Comprehension; P_{40} and P_{90} under the objective Application and P_{70} and P_{80} under Attitude. These spurts observed at several percentile points under all the objectives seem to have led to the large variation mentioned. On the whole, though all the objectives don't show a good performance, to some extent, it is found satisfactory. Here, the various combinations of instructional inputs like transparencies accompanied by the teacher's explanation, visual aids, discussion, bulletin display and summary presentation that were used, proved to be quite effective.

4.3 EFFECTIVENESS OF THE CURRICULUM IN TERMS OF ACHIEVEMENT ON COMPREHENSION TESTS:

The analysis here is made considering performance on the comprehensive test by Experimental and Control group. The data are analysed and presented in two ways. First, the descriptive analysis involving percentiles, mean and standard deviation

is made for the Experimental as well as the Control group on
both pre and post comprehensive tests. The real impetus behind
taking the pre test scores into consideration was, to validate
the curriculum in terms of change observed between the pre and
the post-comprehensive test scores of students. The above men-
tioned analysis was carried out objective wise, as well as the
test as a whole. While presenting the descriptive analysis on
comprehensive test, two comparisons were attempted. One is, pre-
test comparison for both Experimental and Control group, post-
test comparison for both Experimental and control group.
Second is, pre and post test comparison of Control groups, pre
and post test comparison of Experimental group. The second way
in which the data has been analysed is inferentially, using
certain statistical techniques.

Descriptive analysis of data for Experimental and Control group
on Pre and Post Comprehensive Test.

The data analysis and interpretation in respect of
each objective and the total test on both pre and post compre-
hensive test for Experimental and Control group are presented
in the pages to follow. For convenience purpose, the scores
were converted into percentages. In making interpretations, the
criteria of performance mentioned earlier for Criterion test
analysis, namely, 35% pass, 36 - 59% average, 60 - 80% good,
and above 80% outstanding, were maintained.

The data obtained in the Table 4.8 shows a pre-test
comparison of both Experimental and Control group on Comprehensive
test. As one can see almost all the objectives and the test as
a whole even, shows a very poor performance of both Experimental
and Control Group. Just a pass performance is observed only
for 20% of the students from both Experimental and Control group
under the Knowledge objective. Under the comprehension objective,

TABLE 4.8 Percentiles, Mean and Standard Deviation values in respect of Comprehensive pre-tests for Experimental and Control groups- Objective wise and the test as a whole

OBJEC-TIVES \ PERCENTILES	P_{10}	P_{20}	P_{30}	P_{40}	P_{50}	P_{60}	P_{70}	P_{80}	P_{90}	Mean	Standard Deviation (σ)
KNOWLEDGE	11.5	14.75	18.0	21.5	25.21	28.92	33.9	39.1	44.3	27.8	10.13
	11.5	14.75	18.0	21.25	24.5	27.75	31.9	37.1	43.0	26.34	10.98
COMPREHENSION	12.75	16.0	19.25	21.7	24.04	26.40	28.8	34.0	41.5	25.0	10.85
	10.2	13.05	15.94	18.83	21.04	23.03	25.04	27.04	29.04	21.29	7.60
APPLICATION	2.6	5.2	7.8	10.6	14.5	18.83	22.4	26.4	31.5	16.81	12.62
	4.3	8.6	12.5	16.83	20.41	22.8	25.14	27.5	30.83	20.12	9.13
ANALYSIS	1.3	2.6	3.9	5.2	6.5	7.8	9.1	13.5	41.7	9.62	18.07
	2.3	4.6	7.0	9.3	14.5	23.5	37.5	45.5	55.5	13.5	19.11
SKILL	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	∞
ATTITUDE	4.33	8.70	13.1	18.3	24.5	30.7	35.9	51.5	58.0	26.5	23.68
	8.6	19.75	23.0	26.25	29.5	36.0	43.5	52.16	73.5	34.18	24.24
TOTAL TEST	12.1	14.7	17.3	19.94	22.83	25.72	28.61	34.0	40.83	24.92	9.05
	12.1	14.7	17.3	19.78	21.64	23.5	25.35	27.21	29.07	22.65	4.94

NOTE: The figures in the upper row are values obtained for the Experimental group and those in the lower row are for the Control group.

only 10% of the students have seemed to score average from the Experimental, whereas the Control Group shows none. The Application objective even shows a very poor performance of both the groups. The same result is observed under the objective Analysis even. The skill objective unattempted by both the groups. Coming to the Attitude objective, only 10% of the Control group seem to have a positive attitude towards the elements measured, whereas the Experimental group shows none with a positive attitude. The test as a whole even shows a poor performance of both the groups. The mean values even show a poor performance of both the groups. The dispersion values range from 10.13 to the maximum 23.68 for the Experimental group, and from 4.94 to the maximum 24.24 for the Control group, indicating a wide scatter of distribution of scores in both the groups. From the above values, it can be inferred that the students were not aware of most of the contents that were included in the curriculum. It is to be noted that even though they were exposed to the knowledge of Human Reproductive System in Standard VIII under their Science syllabus, most of the students were unable to attend to the items related to it.

The data obtained in the Table 4.9 shows the percentiles, mean and the S.D. Values of the post-comprehensive test, objective-wise as well as the test as a whole for both Experimental and Control group. It is quite obvious from the table that the Experimental group stands superior to the control group, though not outstandingly at all objectives. Under the Knowledge objective, from the Experimental group about 10% of the students have shown a poor performance; 30% have shown an average and 40% of the students have shown a good performance. The last score 89.5 was obtained by the remaining 10% of the students, whereas the Control group shows only 10% of the students securing pass percentage. Coming to the Comprehension objective, from the experimental group, 40% of the students have shown an average performance;

TABLE 4.9 Percentiles, Mean and Standard Deviation in respect of Comprehensive Post tests for Experimental and Control group- objective wise and the test as a whole.

OBJECTIVES / PERCENTILES	P10	P20	P30	P40	P50	P60	P70	P80	P90	MEAN	STANDARD DEVIATION (σ)
KNOWLEDGE	24.7	41.5	53.1	58.3	63.5	68.7	72.64	76.35	89.5	60.55	19.60
	11.78	15.5	19.21	21.68	24.05	26.41	28.8	32.5	36.83	25.7	9.74
COMPREHENSION	36.0	41.0	44.25	47.5	62.0	68.5	75.0	82.16	99.5	61.82	19.81
	11.1	13.7	16.3	18.9	21.04	23.04	25.04	27.04	29.04	21.39	7.39
APPLICATION	60.04	62.40	64.77	67.13	69.5	82.7	87.9	94.0	97.2	76.30	15.73
	6.5	11.21	14.93	18.64	23.5	24.1	26.7	29.3	34.3	21.42	8.92
ANALYSIS	50.03	74.05	81.2	85.53	87.43	89.34	91.23	93.2	95.06	82.9	15.81
	2.0	4.0	6.0	8.0	10.0	13.21	16.92	27.5	46.5	17.84	17.10
SKILL	5%=20	5%=40			27%=60 to 80				63%38%=100	86.15	22.03
ATTITUDE			3.5%=50				11.53%=70		81%=100	92.8	
	21.4	24.64	27.93	32.5	38.25	45.5	51.7	56.3	76.5	37.2	15.6
TOTAL TEST	46.0	55.5	62.07	65.8	69.5	73.21	76.93	80.64	84.3	66.78	13.06
	13.21	16.93	20.0	21.63	23.25	24.9	26.5	28.12	30.83	23.00	5.50

NOTE: The figures in the upper row are values obtained for the Experimental group and those in the lower row are for the Control group.

30% good and the rest 30% have shown an outstanding performance
whereas the Control group shows a very poor performance at all
percentile points. Under the Application objective as one can see,
majority of the students from the Experimental group have performed
well. 50% of the students have shown good performance and the rest
50% have shown an outstanding performance. Under the Analysis
objective even good performance is observed. Besides the 10% of
the students who have scored average, the rest of the students
have shown remarkably an outstanding performance whereas the Con-
trol group shows a very poor performance under both the objectives.
Considering the objectives Skill and Attitude for the Experimental
group, the scores are not normally distributed, due to which the
computation of percentiles was not possible. The scores were
found to be aggregated around 4 to 5 points. For instance, in
the objective Skill, almost 63.38% of the students were found to
have scored 100% showing an outstanding performance, whereas the
rest 27% of the students seem to have performed good scoring be-
tween 60% and 80%. One student had showed low performance by
scoring 20% and another student performed average by scoring 40%.
Coming to the objective attitude, the score seem to have aggregated
around 100, 75 and 50%. Almost 81% of the students seemed to have
shown an outstanding performance by scoring 100% and 11.53% of
the students showing good performance by scoring 75% and the rest
3.5% of the students showing an average performance by scoring
50%. On the contrary, the Control group has not made an attempt
to respond to the items relating to the Skill objective, and under
attitude objective, 40% of the students seem to be holding a posi-
tive attitude and 10% of the students towards highly positive,
whereas the rest of them have shown a poor attitude. The test
as a whole for Experimental group shows 50% of the students with
good performance; 30% with an outstanding performance and the
rest 20% with an average performance. The Control group shows a
poor performance as was shown in the pre-comprehensive test. The
mean values of both the groups show the Experimental group as
better achievers than the Control group. The mean values of know-
ledge, comprehension and application for the Experimental group

show a quite a good performance of students, whereas the mean value, skill, analysis and attitude objectives show an outstanding performance of the students. The dispersion values for the Experimental group seem to be ranging from 13.06 to 22.03 which points to the highly scattered scores in the distribution due to the sudden spurts observed at several percentile points like P_{10}, P_{30} and P_{90} under the knowledge objective, P_{50}, P_{70} and P_{90} under the Comprehension objective, at P_{60} under the Application objective, at P_{20} and P_{30} under the analysis objective and so on. The dispersion values for the Control group ranges from 5.50 to 24.3, wherever the high dispersion value is observed, it is noted that the distribution of the scores is widely scattered. From the above, interpretations, it is clearly noted that the Experimental group to which the curriculum was taught has performed better than the Control group to which the curriculum was not taught. This fact points out clearly to the effectiveness of the curriculum. It is observed in the Experimental group that the mean values of Knowledge, Comprehension and Application do not even reach the value of 80. Even though, when compared to the pre-test performance of the students, there has been a great degree of improvement indicating that the curriculum did have a good effect on pupils' knowledge. Hence, the post test performance of both Experimental and Control group shows that there is a significant difference between the Experimental and the control group on post Comprehensive test which credits to the effectiveness of the curriculum of Family Life Education.

The Table 4.10 shows the percentiles, mean and the S.D. values of pre and post comprehensive test in case of Experimental group. Scrutanising into the details of the table, one can see that the post performance of Experimental students on the Comprehensive test is much better when compared to the pre Comprehensive test. Under the Knowledge and the Comprehension objective, the pre-test performance of the Experimental group students shows only 20% of the students securing pass marks, whereas the remaining

TABLE 4.10 Percentiles, mean and S.D. Values in respect of Comprehensive Pre-test and Post test of Experimental Group

PERCENTILES OBJECTIVES	KNOW-LEDGE	COMPRE-HENSION	APPLI-CATION	ANALYSIS	SKILL	ATTITUDE	TOTAL
P_{10}	11.5	12.75	2.6	1.3	5%=20	4.33	12.1
	24.7	36.0	60.04	50.03	5%=20	-	46.0
P_{20}	14.75	16.0	5.2	2.6		8.70	14.7
	41.5	41.0	62.40	74.05	5%=40	-	55.5
P_{30}	18.0	19.25	7.8	3.9		13.1	17.3
	53.1	44.25	64.77	81.2		-	62.07
P_{40}	21.5	21.7	10.6	5.2		18.3	19.94
	58.3	47.5	67.13	85.53		-	65.8
P_{50}	25.21	24.04	14.5	6.5		24.5	22.83
	63.5	62.0	69.5	87.43		-	69.5
P_{60}	28.92	26.40	18.83	7.8	27%=60 to 80	30.7	25.72
	68.7	68.5	82.7	89.34		-	73.21
P_{70}	33.9	28.8	22.4	9.1		35.9	28.61
	72.64	75.0	87.9	91.23		-	76.93
P_{80}	39.1	34.0	26.4	13.5		51.5	34.0
	76.35	82.16	94.0	93.2		-	80.64
P_{90}	44.3	41.5	31.5	41.7	63.38%=100	58.0	40.63
	89.5	99.5	97.2	95.06		-	84.3
MEAN	27.8	25.0	16.81	9.62		26.5	27.92
	60.55	61.82	76.30	82.9	86.15	92.8	66.78
σ	10.13	10.85	12.62	18.07		23.68	17.05
	19.60	19.81	15.73	15.81	22.03	15.6	13.06

NOTE: The figures in the upper row are values obtained for the pretest-comprehensive and those in the lower row are for the post test-comprehensive of Experimental group.

students show a very poor performance. On the contrary, in the post-test performance, almost 90% of the students have performed well. 30% of the students seem to have shown an average performance, 40% of the students have shown good performance and the rest 10% an outstanding performance. Only 10% of the students seem to have shown a poor performance under both the objectives. Coming to Application objective, almost the same state of results have been observed for pre test performance, as was observed under Knowledge and Comprehension. Almost all the students seemed to have performed very poorly, whereas on the post test 50% of the students have shown a good performance and the remaining 50% have shown an outstanding performance. Under analysis objective, the pre test performance of students show a very poor performance for almost 90% of the students. Only 10% of the students seem to have obtained pass marks, whereas on the post-test, 10% of the students with average, 10% with a good and the rest 80% with an outstanding performance has been observed. Coming to the Skill objective, students had not attempted to answer the items in pre test, whereas on the post test, almost 63.38% were found to have obtained 100% showing an outstanding performance; 27% of the students have obtained good scoring between 60% and 80%. One student had showed low performance by scoring 20% and another student performed average by scoring 40%. Due to this kind of distribution, where the scores were found to be aggregated around four or five points, the distribution was not normal, because of which the computation of percentiles was not possible. Coming to the objective Attitude, almost a similar state is observed, where computation of percentiles was not possible on post test performance of students, due to the crowding of scores around only certain points. The pre-test on Attitude objective shows only 20% with a positive attitude whereas the rest with a low performance. In comparison, the post-test shows 81% of the students with an outstanding performance of 100% and 11.53% of the students with a good performance of 75% and the rest 3.5% of the students with an average performance of 50%. Considering the test as a whole, only 10% of the students with an average performance is observed on pre-test, whereas on the post-test, 20%

of the students were observed with an average performance, 50%
with a good performance and the rest 20% with an outstanding
performance. Looking to mean values of the objectives and the
test as a whole, pre-test performance of students show a very
low performance when compared to the post-test. The mean values
of post-test for objectives like Knowledge, Comprehension and
Application seem to be showing quite a good performance, whereas
the rest of the objectives like analysis, skill and attitude show
mean values of an outstanding performance. The test as a whole
shows a mean value of 66.78 indicating a good performance of the
students. The dispersion values for pre test seem to be ranging
from 9.05 to 23.68 and for post-test from 13.06 to 22.03, indi-
cating a wide scatter of distribution in both the performances.
This may be due to the spurts observed at certain percentile
points and the lower values obtained at initial percentile points.
For instance, the post-test performance under the Knowledge objec-
tive shows quite a low value at P_{10} and then onwards where a
slight advancement of the scores is found. Under the Comprehension
objective, a sudden spurt is observed at P_{50} and P_{90} which accounts
for a high dispersion value of 19.81 for a mean value like 61.82.
Under the Application objective, a sudden spurt is observed at P_{60}.
The Analysis objective shows quite a low value at P_{10} after which
there had been a sudden spurt at P_{20} and then onwards where a gra-
dual increase of scores was found. The dispersion values of 22.03
under Skill objective again shows a wide scatter of scores in the
distribution with sudden spurts at four points as explained ear-
lier. In sum, though an outstanding performance was not observed,
under all objectives, when compared to the pre test performance,
the students have shown quite a good performance. When compared
to the Knowledge and the Comprehension objectives, students seemed
to have performed well at Application, Analysis, Skill and attitude
objectives. This may be due to the inputs like Exercises, discus-
sions, dialogue form and assignments given to increase the levels

of these objectives. On the whole, looking to the table, one could say that the curriculum with its developed materials had definitely an impact on the students thereby increasing the cognition aspect of students in the chosen area of study.

The given Table 4.11 shows the percentiles, mean and the S.D.Values in respect of Comprehensive Pre and post test of Control group. As one can see not much of difference is observed between the pre and the post performance of the students on the Comprehensive test. The Knowledge objective shows 10% of the students obtaining average, the analysis objective showing 20% of the students with an average performance and the objective Attitude showing again 20% of the students with an average performance and 10% of the students with good performance on the pre-Comprehensive test. On the post-test, an average performance is observed for 10% of the students under the objective Knowledge and Analysis, whereas the remaining students under all the objectives, show a very poor performance. The skill objective shows as usual, the non-response of the students on the post-Comprehensive test. Under the Attitude objective, as observed in the pre-comprehensive test, good performance that is, a positive attitude is obtained for only 40% of the students and the other 10% showing a highly favourable attitude, whereas the remaining students show a low performance. The test as a whole even shows a very poor performance on both pre and post tests. The mean values of both pre and post tests even, show a very poor performance, thereby indicating that there is no much difference between both the performances. The dispersion values seem to be ranging from 4.94 to 24.24 for the pre-test and 5.50 to 17.10 for the post-test, indicating a wide scatter of distribution at certain objectives, wherever the high dispersion value is observed. When compared to the Experimental group on post test performance, it is quite obvious that the Experimental group has performed better, due to the experience of having undergone the curriculum course, which was not

TABLE 4.11 Percentiles, mean and S.D.Values in respect of
Comprehensive- pre and post test of Control group

PERCENTILES / OBJECTIVES	Know-ledge	Compre-hension	Appli-cation	Analysis	Skill	Atti-tude	Total
P10	11.5	10.2	4.3	2.3	–	8.6	12.1
	11.78	11.1	6.5	2.0	–	21.4	13.21
P20	14.75	13.05	8.6	4.6	–	19.75	14.7
	15.5	13.7	11.21	4.0	–	24.64	16.93
P30	18.0	15.14	12.5	7.0	–	23.0	17.3
	19.21	16.3	14.93	6.0	–	27.93	20.0
P40	21.25	18.83	16.83	9.3	–	26.25	19.78
	21.68	18.9	18.64	8.0	–	32.5	21.63
P50	24.5	21.04	20.41	14.5	–	29.5	21.64
	24.5	21.04	23.5	10.0	–	38.25	23.25
P60	27.75	23.03	22.8	23.5	–	36.0	23.5
	26.41	23.04	24.1	13.21	–	45.5	24.9
P70	31.9	25.04	25.14	37.5	–	43.5	28.35
	28.8	25.64	26.7	16.92	–	51.7	26.5
P80	37.1	27.04	27.5	45.5	–	52.16	27.21
	32.5	27.04	29.3	27.5	–	56.3	28.12
P90	43.0	29.04	30.83	55.5	–	73.5	29.07
	36.83	29.04	34.3	46.5	–	76.5	30.83
MEAN	26.34	21.29	20.12	13.5	–	34.18	22.65
	25.7	21.39	21.42	17.84	–	37.2	23.00
σ	10.98	7.60	9.13	19.11	–	24.24	4.94
	9.74	7.39	8.92	17.10	–	24.3	5.50

NOTE: The figures in the upper row are values obtained for the pre-
test- Comprehensive and those in the lower row are for
the post test- Comprehensive of Control group.

so in case of Control group. Hence, this serves as one of the
criterion to validate the effectiveness of the curriculum of
Family Life Education on the cognitive aspect of the students.

In sum, it may be remembered that the central theme of
the present investigation has been to study the effectiveness of
the curriculum of Family Life Education at XII standard level.
This has been attempted through the development of curriculum with
the set objectives with main emphasis on instructional framework
supported by certain learning principles and evaluational outcomes,
which could be used in the existing classroom situations, without
causing undue disturbance in the functioning of the present class
rooms. Evidently, the validation of the curriculum should be in
terms of students' attainment of specified instructional objectives
which include both cognitive as well as affective. The study of
the experimental group students' performance on unit tests and
comprehensive tests is in effect to this. This interpretations
of Table from 4.1 to 4.11 reveal that though a well planned and
organised curriculum, it is possible to attain the cognitive as
well as the affective objectives. These tests have shown that
enrichment brought into the curriculum, by using instructional
components such as deviated PLM, audio-visuals, discussions, dia-
logue form, exercises, assignments and Library work except for
the lecture method and summary presentations where students seemed
to have performed low, whereever these components have been used.
Various instructional components in a combined form seemed to
have had a positive influence on the students in bringing about
an improvement in their Knowledge aspect regarding the area of
Family Life Education. It may be mentioned that though an out-
standing performance is not observed for all the students on all
tests and on the post-Comprehensive test, due to the individual
differences like learning style, study habits, a remarkable progress
has been noticed for most of the students in their knowledge acqui-
sition in Family Life Education. This clearly shows that the curri-
culum has served its purpose in being an attempt towards increasing
students' cognition in the area of Family Life Education.

<u>Inferential analysis data on Students' Achievement:</u>

Data obtained on Comprehensive tests for Experimental group and Control group were treated inferentially, details of which are presented here. The following Null Hypotheses were specifically formulated.

H.4.1   There is no significant difference between Experimental group and Control group with respect to mean performance on pre-comprehensive test.

H.4.2. There is no significant difference between Experimental group and Control group with respect to mean performance on post-comprehensive test.

H.4.3. There is no significant difference between the mean performance on the pre and the post comprehensive tests for the Experimental group.

H.4.4   There is no significant difference between the mean performance on the pre and the post comprehensive tests for the Control group.

In testing Hypotheses 4.1 and 4.2, since the groups(Experimental and Control) were made equivalent by matching initially by pairs, sex-wise and age-wise, so that, they were treated as equivalent groups. The 't' formula used was student's 't' for correlated groups. Analysis of data in respect of testing the above two Hypotheses are presented in the table which follows:

TABLE 4.12 Mean, Standard deviation and 't' values obtained in respect of pre test and post-test measures of Achievement for Experimental and Control groups.

| | Experimental Group | | | Control Group | | | 't' | Levels of Significance | |
	N	Mean	σ	N	Mean	σ		0.05	0.01
PRE-TEST	26	24.92	9.05	26	22.65	4.94	2.09	2.06	2.79
POST-TEST	26	66.78	13.06	26	23.0	5.50	4.51*	2.06	2.79

* obtained 't' value is significant at 0.01 level.

The Table 4.12 represents the significance of difference between
Experimental group and Control group with respect to mean perfor-
mance on both pre and post-comprehensive tests. As one can see
from the table, 't' value obtained for both Experimental and Con-
trol group on pre test is not found significant at 0.01. Hence,
the Null Hypothesis stating, there is no difference between Experi-
mental and Control group with respect to mean performance on pre-
test is retained. On the contrary, the 't' value obtained on post-
Comprehensive test is found significant at 0.01 level, which means
the Null Hypothesis is rejected and an alternative Hypothesis
stating, there is a significant difference between Experimental
and Control group with respect to mean performance on post-
comprehensive test is upheld. The mean values obtained for both
the groups on pre test is found almost equal, whereas the mean
values obtained on the post- comprehensive test for both the groups
shows a vast difference, that is, the mean value obtained for Ex-
perimental group stands very superior when compared to the mean
value obtained for the control group. The Experimental group shows
a high dispersion value when compared to Control group on both
the performances. On the whole, the values obtained show that
the developed curriculum of Family Life Education had a quite a
good influence on the Experimental group to which it was implemented.

In testing the Hypotheses 4.3 and 4.4, since the scores
of the groups(Experimental and Control group) were obtained on
the same instrument on two different occassions, these were treated
as correlated data with respect to the criterion under measurement.
The 't'formula used was student's 't' for correlated groups where-
in the 'r' value is accommodated in the denominator so asto in-
crease the differences in the mean as would exist if they were un-
correlated. (Garrett 1979). Analysis of data in respect of testing
the above two Hypotheses are presented in the table which follows:

TABLE 4.13. Mean and Standard deviation and 't' values obtained in respect of Experimental and Control group on Comprehensive pre and post test measures.

GROUP	N	'r'	Pre Comprehensive		Post Comprehensive		Obtained 't'	Levels of Significance	
			Mean	σ	Mean	σ	Value	0.05	0.01
EXPERIMENTAL	26	0.39	24.92	9.05	66.78	13.06	3.40*	2.06	2.79
CONTROL	26	0.56	22.65	4.94	23.0	5.50	0.90	2.06	2.79

* obtained value of t is significant at 0.01 level.

The given Table 4.13 represents the difference between the mean performance on the pre and the post-comprehensive tests for both Experimental and Control groups. As one can see from the table, the 't' value obtained for the Experimental group is found significant at 0.01 level which leads to the rejection of Null Hypotheses and the acceptance of alternative Hypothesis stating, there is a significant difference between the pre-test and the post-test performance on comprehensive test of Experimental group. The difference observed between the mean values obtained on both the performances by the Experimental group even, shows that there has been a remarkable progress in Experimental students, whereas no change has been observed in the mean values obtained on pre and post comprehensive tests in case of Control group, which means the null Hypotheses stating, there is no significant difference between the mean performance on pre-comprehensive and post-comprehensive tests for the control group is retained. The above interpretation clearly indicates to the effectiveness of the curriculum developed.

Inferential analysis of data on achievement(Experimental group- (Boys and Girls)

Data obtained on the Comprehensive test for both boys and girls belonging to the Experimental group were treated inferentially, in order to know the level of performance in boys and

and girls separately and differences observed in the level of performance between boys and girls. The following Null Hypotheses were specifically formulated.

H.4.5.   There is no significant difference between the mean per-
         formance on the pre and the post-comprehensive tests for
         the boys.

H.4.6.   There is no significant difference between the mean per-
         formance on the pre and the post-comprehensive tests for
         the girls.

H.4.7.   There is no significant difference between boys and girls
         with respect to mean performance on pre-comprehensive test.

H.4.8.   There is no significant difference between boys and girls
         with respect to mean performance on post-comprehensive test.

In testing the Hypotheses 4.5 and 4.6, since the scores were ob-
tained on the same instrument at two different occassions for a
single group, it is considered as correlated data, with respect to
the criterion under the measurement. Due to the sample which is
small in size, the 'Difference method' which is a student's 't'
for correlated groups, was used. The analysed data is given under,
in the form of a table.

TABLE 4.14 Mean and standard deviation and 't' values obtained in
respect of boys and girls on comprehensive pre and post
test measures.

SEX	N	PRE TEST		Post Test		't' value	Levels of significance	
		Mean	σ	Mean	σ		0.05	0.01
BOYS	16	22.12	8.0	74.53	8.28	*15.72	2.13	2.95
GIRLS	10	29.41	9.24	54.32	9.05	* 5.12	2.26	3.25

* obtained value of 't' is significant at 0.01 level.

It is clearly evident from the table 4.14 that, there is a
difference between the pre-test and post-test performance of
students on comprehensive test, looking into the mean gains of
the scores obtained. The obtained 't' values for both boys and
girls, i.e.(15.75 and 5.12) were found significant at both 0.05
and 0.01 levels of significance. Generally speaking, the larger
the difference between the two means, the greater the value of
't' will be. Thus, it may be concluded saying, that the larger
the 't' value, the less the probability is that the difference
between the two means is a function of mere chance. This clearly
indicates that the students have made substantial progress in
their knowledge gain in the area of Family Life Education. Subse-
quently, this serves as ane of the criterion to measure the effec-
tiveness of the Curriculum on the cognition of students.

To study the Hypotheses 4.7 and 4.8, the mean difference
between the girls' and boys' performance on pre and post comprehen-
sive tests is calculated by using the formula

$$S.D. = \frac{\sum_{1}(X_1 - M_1)^2 + \sum_{1}(X_2 - M_2)^2}{(N_1 - 1) + (N_2 - 1)}$$ (57) Garrett

where the two small independent samples of boys and girls are
pooled and the formula $SE_D = SD\sqrt{\dfrac{N_1 + N_2}{N_1 N_2}}$ (58) Garrett

where the difference between means in small independent samples
calculated was used. The detailed analysis is given under in the
Table 4.15 and 4.16

TABLE 4.15 Mean and Standard deviation and 't' values in respect
of pre test measure of Achievement for boys and girls

SEX	N	Pre-compre-hensive Test		't'	Levels of Significance	
		Mean	σ		0.05	0.01
BOYS	16	22.12	8.0	2.44	*2.06	@*2.81
GIRLS	10	29.41	9.24			

* Obtained 't' value is significant at 0.05 level
@ Obtained 't' value is not significant at 0.01 level.

As it is seen from the Table 4.15, the obtained 't' value is found
significant at 0.05 level of significance, but not at 0.01 level
of significance, which shows that the mean difference obtained
between boys and girls on the pre-comprehensive test is not signi-
ficant. Hence, the Null Hypothesis stating that there is no sig-
nificant difference between boys and girls with respect to mean
performance on pre-comprehensive test is retained.

The Table 4.16 gives a detailed analysis of mean perfor-
mance between boys and girls on post-comprehensive test.

TABLE 4.16 Mean, Standard deviation and 't' values in respect of
post test measure of Achievement for boys and girls

Sex	NO.	Mean	Standard Deviation	't' value	Levels of Significance	
					0.05	0.01
BOYS	16	74.53	8.28	*4.50	2.06	2.80
GIRLS	10	54.32	9.05			

* Obtained 't' value is significant at 0.01 level.

As one can see from the Table 4.16, the obtained 't' value of
4.50 was found to be significant at 0.01 level of significance.
Though the girls have performed better when compared to their pre-
comprehensive test, definetely they show a low performance when
compared to boys. Hence, the Null Hypothesis is rejected and an
alternative Hypothesis stating, that there is a significant
difference between boys and girls with respect to mean performance
on post comprehensive test is upheld.

Section 2

4.4 EFFECTIVENESS OF THE CURRICULUM IN TERMS OF STUDENTS' ATTITUDE

The data obtained on the Attitude test (pre test and post test) for the Experimental group and the Control group have been analysed in two ways. One, descriptive statistics like percentiles, mean and standard deviation have been calculated for pre test and post test data. The value obtained have been compared to know the change if any, in respect of each group. Two, the data have been analysed inferentially to get a deeper insight into the change in respect of each group, in order to know the effect of the curriculum. Further, the data have been analysed inferentially for the experimental group in order to compare the effectiveness of the Curriculum on boys and girls. In order to discuss the attitude test as a whole as well as component-wise, score limits have been fixed to indicate strongly unfavourable, unfavourable, neutral, favourable and strongly favourable, which are as follows:

0 to 20	Strongly unfavourable
21 to 40	Unfavourable
41 to 60	Neutral
61 to 80	Favourable
81 to 100	Strongly favourable

Descriptive analysis of data for Experimental and Control group on Pre and Post- attitude test

In the Table 4.17, pre test performance depicting highly favourable attitude towards self is observed for 20% girls in the Experimental under Section Ia; 20% in the Control group under Section Ib and 10% of the boys in the Control group under Section Ic. Under most of the Attitudinal components, 30 to 40% of the students seem to be expressing favourable attitude, whereas the rest of the students seem to be holding an unfavourable attitude.

TABLE 4.17 . Percentiles, Mean and Standard Deviation in respect of Attitude Pre-test for Experimental and Control Group

PERCENT-ILES/COMPONENTS	Section Ia	Section Ib	Section Ic (boys)	Section Ic (girls)	Section II (boys)	Section II (girls)	Section III	Section IV	Section V	TOTAL
P10	23.5	47.5	39.5	42.0	50.04	42.0	34.83	42.5	51.5	44.7
	37.0	33.21	40.7	32.83	43.5	40.33	34.83	41.5	43.83	40.83
P20	31.5	51.9	43.5	44.5	51.5	44.5	43.5	50.35	54.8	49.7
	43.5	36.92	43.9	36.2	47.5	42.40	45.5	49.7	48.2	43.0
P30	51.13	54.8	51.5	47.0	52.9	47.0	51.0	52.21	58.0	52.05
	50.0	40.3	47.1	39.5	50.4	43.8	51.0	51.83	51.8	45.2
P40	53.5	57.7	55.5	49.5	54.4	49.5	53.2	54.07	60.7	54.41
	56.5	42.9	53.5	41.5	52.2	45.21	53.2	54.0	55.0	47.33
P50	55.9	60.6	59.5	64.5	55.9	52.8	55.33	55.92	62.83	56.8
	62.75	45.5	62.0	43.5	53.94	46.64	55.33	56.16	58.3	49.5
P60	58.22	63.5	63.5	69.5	57.32	56.2	57.5	57.8	65.0	59.14
	69.5	48.1	66.0	45.5	55.72	48.07	57.5	58.33	61.3	51.5
P70	62.5	66.4	67.5	79.5	58.8	59.5	59.9	60.0	67.2	61.94
	76.0	51.9	70.5	47.5	57.5	49.5	60.0	61.5	64.2	53.5
P80	69.5	69.3	72.2	82.8	61.5	64.5	65.1	66.5	69.33	64.83
	83.2	57.1	78.5	49.5	59.3	59.5	66.5	65.83	67.06	55.5
P90	74.3	74.3	77.5	86.2	65.5	69.5	73.5	73.0	74.3	67.72
	91.83	64.2	91.5	69.5	64.2	64.5	76.5	70.83	70.83	57.5
MEAN	52.66	59.98	60.38	62.40	56.41	56.0	55.24	57.26	61.6	56.0
	41.72	46.80	62.41	46.00	54.82	48.5	56.14	56.31	57.7	49.8
σ	17.38	9.12	10.67	17.84	5.54	13.39	13.20	11.42	8.74	8.98
	16.53	10.9	17.93	10.9	5.9	10.09	13.5	11.9	9.53	4.90

NOTE: The figures in the upper row are values obtained for the Experimental group and those in the lower row are for the Control group.

This may be due to the exposure of students to the increased
efforts of Government to spread the message of Family Planning
through mass media and communication, in order to bring forth
a lasting change in attitude and values regarding a small family
norm among the younger generation. The test as a whole, shows
the favourable attitude for only 30% of students from the Ex-
perimental group. Looking to the mean values, most of the
sections of the Attitude test fall under the unfavourableness
or in other words negative attitude except the sections like
Section Ic (boys and girls) and Section 6 from the Experimental
group and Section Ic(boys) from the Control group. This suggests
that most of the students hold rather unfavourable attitude to-
wards-their selves, opposite sex members, sexual matters, marriage
and family despite the superiority shown by the Experimental
group over the Control one, in certain sections. The mean
value of the total test is just 56.0 for the Experimental group
and 49.8 for the Control group, both indicating the unfavourable
attitudes of the students. The dispersion values seem to be
ranging from 8.74 to 17.84 for the Experimental group and from
5.9 to 17.93 for the Control group. Under certain sections, the
dispersion value seems to be high, because of the sudden spurts
at certain percentile points. In sum, the scores obtained for
both Experimental as well as for the Control group show that
most of the students seem to towards the unfavourability on the
attitude scale.

The Table 4.18 represents the comparison of scores
obtained on the post-attitude performance for the Experimental
and the Control group in the form of percentiles, mean and SD
values. In the table, post-test performance depicting highly
favourable attitude is found only for Experimental group, where-
as the Control group has tended to show the same poor attitude
performance as was found in the pre-attitude test. This very
fact of difference in attitude between the Experimental and the
Control group attributes to the Knowledge gained by the students
by undergoing the curriculum experience, which was incorporated
with the instructional elements catering to the cognitive

TABLE 4.18. Percentiles, Mean and Standard Deviation in respect of Attitude Post-tests for Experimental and Control groups

PERCEN-TILES COMPO-NENTS	Section Ia	Section Ib	Section Ic (boys)	Section Ic (girls)	Section II (boys)	Section II (girls)	Section III	Section IV	Section V	TOTAL
P_{10}	62.2 / 16.2	63.5 / 32.7	81.8 / 42.7	64.5 / 32.83	62.7 / 44.83	54.5 / 41.2	61.1 / 34.83	68.2 / 41.5	70.00 / 48.2	69.4 / 40.05
P_{20}	66.5 / 22.64	69.8 / 37.9	84.0 / 45.9	69.5 / 36.2	65.9 / 49.72	59.5 / 42.83	63.7 / 45.5	71.33 / 49.7	72.40 / 51.7	70.83 / 42.41
P_{30}	70.3 / 26.4	73.0 / 41.14	86.4 / 49.1	74.5 / 39.5	69.1 / 51.5	62.0 / 44.5	66.3 / 51.0	73.5 / 52.3	74.80 / 54.3	72.3 / 44.8
P_{40}	72.9 / 31.5	76.3 / 43.5	88.6 / 56.5	79.5 / 41.2	71.3 / 53.3	64.5 / 46.2	68.9 / 53.2	75.7 / 54.92	77.13 / 56.9	73.1 / 47.14
P_{50}	75.5 / 49.5	79.5 / 45.9	90.61 / 62.0	82.0 / 42.83	73.3 / 55.1	67.0 / 47.83	74.5 / 55.33	77.83 / 57.5	79.5 / 59.5	75.2 / 49.5
P_{60}	78.1 / 52.1	82.6 / 48.23	92.4 / 66.0	84.5 / 44.5	75.5 / 56.83	69.5 / 49.5	81.5 / 57.5	80.25 / 60.25	81.9 / 62.1	76.6 / 51.5
P_{70}	81.5 / 54.7	86.0 / 51.5	94.2 / 70.2	87.0 / 46.2	77.3 / 58.61	79.5 / 54.5	84.6 / 60.0	83.5 / 65.2	84.22 / 64.7	82.5 / 53.5
P_{80}	85.83 / 57.3	89.3 / 55.83	95.9 / 75.5	89.5 / 47.83	79.3 / 61.5	82.8 / 59.5	88.0 / 62.5	86.8 / 66.8	86.60 / 67.3	85.8 / 55.5
P_{90}	90.83 / 60.83	94.3 / 60.83	97.7 / 81.5	94.5 / 49.5	84.2 / 65.5	86.2 / 64.5	93.0 / 74.2	90.83 / 70.83	89.0 / 70.83	98.5 / 57.5
MEAN	75.08 / 41.52	80.4 / 46.11	90.7 / 60.8	82.23 / 43.12	72.3 / 55.62	69.4 / 48.4	75.24 / 56.4	77.77 / 55.9	80.09 / 59.16	78.23 / 49.53
σ	13.28 / 16.2	11.33 / 10.64	5.30 / 12.9	9.71 / 11.13	5.90 / 6.70	11.05 / 7.70	11.34 / 13.0	7.99 / 11.4	7.90 / 9.35	6.91 / 5.61

NOTE: The figures in the upper row are obtained for the Experimental group and those in the lower row are for the Control group.

improvement and attitude modification in the chosen field of experimentation. Highly favourable attitude is observed under almost all sections for Experimental group, whereas only 10% of the students(boys) were found to be highly favourable towards their physical self from the Control group. As one can see from the table, 30 to 40% of the students from the Experimental group seem to be showing a highly favourable attitude towards their psychological and social selves, whereas the rest of them show favourable attitude. On the contrary, the Control group shows only 10% of the students showing favourable attitude towards their psychological and social selves, whereas the rest of them show a poor, rather a negative attitude towards their selves. Coming to the Section Ic, that is, attitude towards physical self, almost 100% of the boys from the Experimental group seem to be holding a highly positive attitude towards their physical self, whereas the Control group shows 40% of the boys holding a positive attitude, 10% highly positive and the rest showing a negative attitude. Even among girls, quite a good result is obtained, like 50% of the girlsx have shown highly positive attitude towards their physical self. The rest also have shown quite a good improvement by expressing a positive attitude towards their physical self, whereas the Control group shows a very poor distribution of scores, indicating the negative attitude of students. Towards the opposite sex members, Experimental group shows a highly positive attitude for 10% boys and 20% girls, and the rest of them showing a favourable attitude. This indicates a very positive attitude held by all the students of the Experimental group, whereas the Control group shows only 20% boys and 10% girls holding a positive attitude towards the opposite sex members. Towards the sexual matters, once again the Experimental group stands superior to the Control group by showing 40% of the students expressing highly positive attitude and the rest even showing a healthy and a positive attitude. Under the Control group, only 30% of the students seem to be holding a positive attitude towards the sexual matters. Towards

marriage and Family, almost all students from Experimental group have shown a positive attitude, especially 40% of students under both the sections have shown a high positive attitude, whereas the Control group shows only 40% of the students with a positive attitude under both the sections, while rest of them remain with a negative attitude. The Attitude test as a whole shows the experimental group to be much superior to the Control group, by showing almost 70% with a positive attitude and the rest 30% with a highly positive attitude. The Control group shows no difference in the attitude performance from the pre-test which clearly points out to the impact of curriculum with its instructional inputs on the attitudes of students. Looking to the mean values, the Experimental group shows quite a positive value for almost all attitudinal components. Certain components like, attitude towards self and attitude towards Family shows the value of highly positive nature, whereas the mean value of the Control group shows the negative attitude of students towards almost all attitudinal components; except for the Section Ic(boys), where the value shows of a positive nature. The dispersion values in respect of all the components of the Attitude test as well as Attitude test as a whole, seem to be ranging from 5.30 to 13.28 for the Experimental group and 6.70 to 16.2 for the Control group. The maximum dispersion can be explained as being due to the spurts observed at certain points of distribution namely, P_{20}, P_{80} and P_{90} in case of Experimental group, and the spurts observed at certain points like P_{20} and P_{50} in Control group. In sum, the observations suggest that the Experimental group depicts relatively a higher performance than the Control group on the Attitude test. Therefore, the developed curriculum has been more effective for the development of attitude towards the chosen elements under the study.

TABLE 4.19. Percentiles, mean and S.D. Values in respect of the Attitude- Pre and post test in Experimental Group

PERCENTILES COMPONENTS	P_{10}	P_{20}	P_{30}	P_{40}	P_{50}	P_{60}	P_{70}	P_{80}	P_{90}	Mean	σ
SECTION -Ia	23.5	31.5	51.13	53.5	55.9	58.22	62.5	69.5	74.3	52.66	17.38
	62.2	66.5	70.3	72.9	75.5	78.1	81.5	85.83	90.83	75.08	13.28
SECTION -Ib	47.5	51.9	54.8	57.7	60.6	63.5	66.4	69.3	74.3	59.98	9.12
	63.8	69.8	73.0	76.3	79.5	82.6	86.0	89.3	94.3	80.4	11.33
SECTION -Ic (BOYS)	39.5	43.5	51.5	55.5	59.5	63.5	67.5	72.2	77.5	60.38	10.67
	81.8	84.0	86.4	88.6	90.61	92.4	94.2	95.9	97.7	90.7	5.30
SECTION- Ic (GIRLS)	42.0	44.5	47.0	49.5	64.5	69.5	79.5	82.8	86.2	62.40	17.84
	64.5	69.5	74.5	79.5	82.0	84.5	87.0	89.5	94.5	82.23	9.71
SECTION -II (BOYS)	50.04	51.5	52.9	54.4	55.9	57.32	58.8	61.5	65.5	56.41	5.54
	62.7	65.9	69.1	71.3	73.3	75.5	77.3	79.3	84.2	72.3	5.90
SECTION- II (GIRLS)	42.0	44.5	47.0	49.5	52.8	56.2	59.5	64.5	69.5	56.0	13.39
	54.5	59.5	62.0	64.5	67.0	69.5	79.5	82.8	86.2	69.4	11.05
SECTION- III	34.83	43.5	51.0	53.2	55.33	57.5	59.9	65.1	73.5	55.24	13.20
	61.1	63.7	66.3	68.9	74.5	81.5	84.6	88.0	93.0	75.24	11.34
SECTION- IV	42.5	50.35	52.21	54.07	55.92	57.8	60.0	66.5	73.0	57.26	11.42
	68.2	71.33	73.5	75.7	77.83	80.25	83.25	86.8	90.83	77.77	7.99
SECTION- V	51.5	54.8	58.0	60.7	62.83	65.0	67.2	69.33	74.3	61.6	8.74
	70.002	72.40	74.80	77.13	79.5	81.9	84.22	86.60	89.0	80.09	7.90
TOTAL	44.7	49.7	52.05	54.41	56.8	59.14	61.94	64.83	67.72	56.0	8.98
	69.4	70.83	72.3	73.1	75.2	76.6	82.5	85.8	98.15	78.23	6.91

NOTE: The figures in the upper row are obtained for the Attitude pre test and those in the lower row are for the Attitude post test of the Experimental group.

The Table 4.19 shows the difference in the pre and the post performance of Experimental students on the attitude test in the from of percentiles, mean and the S.D.Values. Looking across the components of the attitude test, it is quite obvious that the Experimental students have performed much better on the post-test than on the pre-test indicating that the curriculum had a positive effect on Students' Attitude. The pre test scores for attitude towards psychological self is found to be positive only for 30% of the students, whereas the post test scores show a positive attitude for almost all students. 60% of the students seem to be holding a positive attitude towards their psychological selves, whereas the rest 40% shows a highly positive attitude of students towards their psychological self. Towards the social self, the pre-test performance of students show a positive attitude for 40% of the students, whereas the post performance of students show positive attitude for 50% of students, highly positive for the remaining 50% of students. Towards the biological self, the pre test performance of boys show positive attitude for 40% of students, whereas on post test highly positive attitude is observed for almost all students. The pre-test performance of girls towards the biological self shows positive attitude for 30% of students, highly positive attitude for 20% of students whereas the post test performance shows positive attitude for 40% and highly positive attitude for the remaining 60% of the students. Towards the opposite sex members, both boys and girls show positive attitude only for 20% whereas the rest show a very poor attitude. On the contrary, the post-test performance of boys show positive attitudefor 80% of the students and highly positive attitude for the remaining 20% whereas in case of girls, positive attitude is observed for 50% and highly positive attitude for 30% and the remaining 20% fall under negative attitude towards the the opposite sex members. The pre test performance towards the

sexual matters show positive attitude for only 20% and a negative
attitude is observed for the remaining students. On the contrary,
the post-test performance shows positive attitude for 50% and
high positive attitudes for the remaining 50% of the students.
Towards the aspect of marriage, again a positive attitude is
observed only for 30% on the pre test performance whereas the
post test shows a positive attitude for 50% and highly positive
attitude for the remaining 50% of the students. Towards the
family, almost 60% seem to be positive on the pre-test performance
itself. The post test of course, shows an improvement by 50%
towards the positive and the remaining 50% towards highly positive.
The test as a whole, shows a positive attitude for 30% of the
students on pre-test performance whereas on the post test, a
positive attitude for 60% of the students and a highly positive
attitude for the remaining 40% of the students is observed.
Looking to the mean values, the pre-test performance shows a
positive mean value for attitude towards biological self(boys
and girls) and attitude towards family. The dispersion values
for pre-test seem to be higher when compared to the post test
performance. This accounts to the fact, that there was a wide
scatter of distribution of scores in the pre-test which resulted
in large variation. On the whole, there is a significant differ-
ence observed between the pre and the post performance of students
on the Attitude test. It is quite obvious from the above inter-
pretation that the curriculum had a good effect on the attitude
of students towards the chosen elements for the study.

The data obtained in the Table 4.20 represents the
difference between the pre and the post performance of Control
group students on Attitude test. As one can see not much differ-
ence is observed between the pre and the post performance, due
to lack of treatment of curriculum course. Under Section Ia,
30% of the students with positive attitude and 20% with highly
positive attitude is observed in the pre test performance, whereas

TABLE 4.20 Percentiles, Mean and Standard Deviation values in respect of Attitude pre-post test in Control Group

COMPONENTS / PERCENTILES	P_{10}	P_{20}	P_{30}	P_{40}	P_{50}	P_{60}	P_{70}	P_{80}	P_{90}	Mean	σ
SECTION I	37.0	43.5	50.0	56.5	62.75	69.5	76.0	83.2	91.83	41.72	16.53
	16.2	22.64	26.4	31.5	49.5	52.1	54.7	57.3	60.83	41.52	16.2
SECTION Ib	33.21	36.92	40.3	42.9	45.5	48.1	51.9	57.1	64.2	46.80	10.9
	32.7	37.9	41.14	43.5	45.9	48.23	51.5	55.83	60.83	46.11	10.64
SECTION 1c BOYS	40.7	43.9	47.1	53.5	62.0	66.0	70.5	78.5	91.5	62.41	17.93
	42.7	45.9	49.1	56.5	62.0	66.0	70.2	75.5	81.5	60.8	12.9
SECTION 1c GIRLS	32.83	36.2	39.5	41.5	43.5	45.5	47.5	49.5	69.5	46.00	10.9
	32.83	36.2	39.5	41.2	42.83	44.5	46.2	47.83	49.5	43.12	11.13
SECTION II BOYS	43.5	47.5	50.4	52.2	53.94	55.72	57.5	59.3	64.2	54.82	5.9
	44.83	49.72	51.5	53.3	55.1	56.83	58.61	61.5	65.5	55.62	6.70
SECTION II GIRLS	40.93	42.40	43.8	45.21	46.64	48.07	49.5	59.5	64.5	48.5	10.09
	41.2	42.83	44.5	46.2	47.83	49.5	54.5	59.5	64.5	48.4	7.70
SECTION III	34.83	45.5	51.0	53.2	55.33	57.5	60.0	66.5	76.5	56.14	13.5
	34.83	45.5	51.0	53.2	55.33	57.5	60.0	62.5	74.2	56.4	13.0
SECTION IV	41.5	49.7	51.83	54.0	56.16	58.33	61.5	65.83	70.83	56.31	11.9
	41.5	49.7	52.3	54.9	57.5	60.25	65.2	66.8	70.83	55.9	11.4
SECTION V	43.83	48.2	51.8	55.0	58.3	61.3	64.2	67.06	70.83	57.7	9.53
	48.2	51.7	54.3	56.9	59.5	62.1	64.7	67.3	70.83	59.6	9.35
TOTAL	40.83	43.0	45.2	47.33	49.5	51.5	53.5	55.5	57.5	49.8	4.90
	40.05	42.41	44.8	47.14	49.5	51.5	53.5	55.5	57.5	49.53	5.61

NOTE: The figures in the upper row are obtained for the Attitude Pre test and those in the lower row are for the Attitude post test of the Control Group.

the post-test performance shows only 10% of the students with
a positive attitude. Under Section Ib, only 10% of the students
seem to be holding a positive attitude towards their social self.
The same result is observed in the post performance also. Atti-
tude towards the biological self, (Section Ic boys) shows 40%
of the students with positive attitude and 10% of the students
with a highly positive attitude in both the performances, whereas
among girls, 10% show a positive attitude in the pre performance
and none in the post-performance. Towards the opposite sex mem-
bers, 10% of the boys show a positive attitude x in the pre-
performance and 20% of the boys in post-performance. Among girls,
10% have shown a positive attitude in pre as well as post perfor-
mance, towards the opposite sex members. Towards sexual matters,
30% of the students in both pre as well as post seem to be hold-
ing a positive attitude. Towards marriage 30% of the students
with positive attitude in the pre-test performance and 40% with
a positive attitude in the post test performance is observed.
Towards a small family, 40% of the students seem to be with a
positive attitude in both the performances. The test as a whole,
shows a negative attitude of students in both the performances.
The mean values show a positive attitude only for Section Ic, boys
that is Attitude towards biological self, whereas the mean
values obtained for the other attitudinal components show a nega-
tive attitude of students in both the pre and post performances.
The dispersion values seem to be ranging from 4.90 to 17.93 in
the pre-test performance and from 5.61 to 16.2 in the post-test
performance, the former showing a larger variation due to sudden
spurts in the scores. Anyway, in both the performances, a large
variation is observed which is due to the sudden spurts at cer-
tain percentiles and low values obtained at the initial percen-
tiles points. In sum, one can say that there is no significant
difference observed between pre and post attitude test. The

students seem to be holding almost the same negative attitude
through out. This clearly points out to the fact that the
developed curriculum does have an effect on the students' atti-
tude towards their self, the opposite sex members, the sexual
matters, the marriage and the family as evidenced by the Experi-
mental students in their attitudinal improvement after undergoing
the curriculum course.

Inferential analysis Data on Students' Attitude:

Data obtained on Attitude test for Experimental group
and Control group were treated inferentially, details of which
are presented here. The following Null Hypotheses were speci-
fically formulated.

H.4.9. There is no significant difference between Experimental
        group and Control group, with respect to mean performance
        on pre-attitude test.

H.4.10. There is no significant difference between Experimental
        group and Control group, with respect to mean performance
        on post-attitude test.

H.4.11. There is no significant difference between the mean
        performance on pre-test and post-test of attitude for
        the Experimental group.

H.4.12. There is no significant difference between the mean per-
        formance on pre-test and post-test of attitude for the
        Control group.

In testing the Hypotheses 4.9 and 4.10, since the groups (Experi-
mental and Control) were made equivalent by matching initially
by pairs sex-wise and age-wise, so that they were treated as
equivalent groups. The 't' formula used was student's 't' for
correlated groups. Analysis of data in respect of testing the
above two Hypotheses are presented in the table which follows.

TABLE 4.21 Mean, Standard Deviation and 't' values obtained in RESPECT of pre test and post test measures of attitude for Experimental and Control groups

	Experimental Group			Control Group			't'	Levels of Significance	
	N	Mean	σ	N	Mean	σ		0.05	0.01
PRE TEST	26	56.53	8.63	26	49.8	4.90	2.72	2.06	2.79
POST TEST	26	80.09	7.90	26	49.53	5.61	*4.39	2.06	2.79

* Obtained value of 't' is significant at 0.01 level

As can be seen from the table, the 't' values obtained for Experimental and Control group on attitude pre test is not found significant at 0.01 level of significance. Hence the Null Hypothesis stating, there is no significant difference between the Experimental and the Control group on Pre-attitude test is retained. The 't' value obtained on post-test is found highly significant at 0.01 level of significance, hence the null Hypothesis in this case is rejected and an alternative Hypothesis stating, there is a significant difference between the Experimental and the Control group on post-attitude test is upheld. Looking to the mean values, there is a vast difference observed between Expefimental and Control group on the post-attitude test. From the high values obtained by Experimental group, it is quite evident that the developed curriculum implemented to the Experimental group has been very effective in improving the attitudes of Experimental group students, when compared to the attitudes of Control group students, to whom the curriculum was not implemented.

In testing the Hypotheses 4.11 and 4.12, the 'Difference Method' was used. The analysed data are given in the tables 4.22 and 4.23. As can be seen from the table 4.22, the 't' values obtained for the Experimental group are found highly significant

TABLE 4.22 Mean, Standard Deviation and 't' values obtained
in respect of Experimental Group on pre and post-
attitude Test(Component-wise) measures.

COMPONENTS	Pre-attitude Test		Post Attitude Test		't' value (obtained)	Levels of Significance	
	Mean	σ	Mean	σ	ed)	0.05	0.01
SECTION-Ia	52.7	17.4	75.08	13.3	7.07	2.06	2.79
SECTION-Ib	59.98	9.12	80.44	11.33	9.05	2.06	2.79
SECTION-Ic							
BOYS	60.38	10.67	90.71	5.30	3.59	2.13	2.95
GIRLS	62.40	17.84	82.23	9.71	4.04	2.26	3.25
SECTION-II							
BOYS	56.41	5.54	72.25	5.90	7.88	2.13	2.95
GIRLS	55.99	13.39	69.39	11.05	3.42	2.26	3.25
SECTION-III	55.24	13.20	75.24	11.34	10.71	2.06	.2.79
SECTION-IV	57.26	11.42	77.77	7.99	8.44	2.06	2.79
SECTION-V	61.6	8.74	80.09	7.90	9.84	2.06	2.79
TOTAL TEST	56.0	8.98	78.23	6.91	4.40*	2.06	2.79

NOTE: Section -1a =Attitude towards the psychological self.
Section- Ib =Attitude towards the social self.
Section-Ic =Attitude towards the biological self
Section -II =Attitude towards the opposite sex members
Section-III= Attitude towards the sexual matters.
Section-IV= Attitude towards the marriage.
Section-V = Attitude towards the Family.

* Obtained value of 't' on the total attitude test is found significant
at 0.01 level.

beyond 0.01 level of significance for all attitudinal components measured, that is, the attitude towards self (psychological, social and the biological), the attitude towards opposite sex members, the attitude towards sexual matters, the attitude towards marriage and the attitude towards family. The 't' value obtained on the total attitude test even shows a highly significant value. This shows that there is a significant difference between the pre and the post-attitude measures of Experimental group students. Looking to the mean values, the mean values obtained for all the attitudinal components were found much superior to those values obtained on the pre-attitude test. From the high values obtained by the Experimental group on post-attitude test, it is quite evident that the developed Curriculum of Family Life Education, with instructional experiences planned to improve the cognition and the affect attributes, has been very effective in improving the attitudes of learners towards their psychological, social and biological selves, towards their opposite sex members, towards the sexual matters, towards the marriage and the family. Hence the Null Hypothesis is rejected and an alternative Hypothesis stating, there is a significant difference between the mean performance on pre-test and post-test attitude for the Experimental group is upheld.

Analysis of data testing the Hypothesis 4.12 is presented in the Table 4.23. As can be seen from the table, the 't' values obtained on the pre and the post attitude test for Control group are not found significant at any level of significance. From the table, it is seen that the 't' values obtained for all the attitudinal components fall below the level of significance, except for the 't' value of 4.13 obtained for boys under the attitude towards opposite sex members, though the mean values obtained for boys under this attitudinal component shows hardly any difference between the pre and the post-attitude test. This significant 't' value obtained may be due to the positive differences obtained between the pre and the post attitude test.

TABLE 4.23 Mean, Standard Deviation and 't' values obtained in respect of Control Group on pre and post-attitude test(Component-wise) measures.

COMPONENTS	Pre=Attitude Test		Post-Attitude Test		't' value (obtai-ned)	Levels of significance	
	Mean	σ	Mean	σ		0.05	0.01
SECTION-Ia	41.72	16,53	41.52	16.2	0.1	2.06	2.79
SECTION-Ib	46.8	10.9	46.11	10.64	0.98	2.06	2.79
SECTION-Ic							
BOYS	62.41	17.93	60.8	12.9	0.47	2.13	2.95
GIRLS	46.0	10.9	43.12	11.13	0.96	2.26	3.25
SECTION-II							
BOYS	54.82	5.9	55.62	6.70	4.13	2.13	2.95
GIRLS	48.5	10.09	48.4	7.70	0.08	2.26	3.25
SECTION-III	56.14	13.5	56.4	13.0	0.32	2.06	2.79
SECTION-IV	56.31	11.4	55.9	11.9	0.16	2.06	2.79
SECTION-V	57.7	9.53	59.6	9.53	0.80	2.06	2.79
TOTAL TEST	49.8	4.90	49.53	5.61	0.43*	2.06	2.79

NOTE: Section-Ia   Attitude towards the psychological self.
      Section-Ib   Attitude towards the social self.
      Section-Ic   Attitude towards the Biological self.
      Section-II   Attitude towards the opposite sex members.
      Section-III Attitude towards the sexual matters.
      Section-IV   Attitude towards the Marriage.
      Section-V   Attitude towards the Family.

* obtained 't' value 0.43 is not found significant at 0.05 level.

There was no difference observed in the mean values obtained on pre and post-attitude test under other attitudinal components. The mean values obtained on the total test also doesn't show any variation between the pre and the post-test performance. The 't' value of 0.43 obtained on the total test even shows that there is no significant difference between the pre and the post-attitude. Hence, the Null Hypothesis stating, there is no significant difference between the mean performance on pre-test and post-test of attitude for the Control group is accepted.

Inferential analysis of data on attitude (Experimental Group-Boys and Girls)

Data obtained on the attitude test for both boys and girls belonging to Experimental group were treated inferentially, in order to know the differences in attitude between boys and girls, and the improvement observed in boys and girls separately. The details of the analysis are presented hereunder. The following Null Hypotheses were specifically formulated.

H.4.13   There is no significant difference between the mean performance on the pre and the post attitude tests for the boys.

H.0.14   There is no significant difference between the mean performance on the pre and the post-attitude tests for the girls.

H.4.15   There is no significant difference between boys and girls with respect to mean performance on pre-attitude test.

H.4.16   There is no significant difference between boys and girls with respect to mean performance on post-attitude test.

The Hypotheses 4.13 and 4.14 were tested for the difference between the two means (pre attitude and post-attitude test).

where these means represent the performance of independent groups-
boys and girls. As the groups are small, the same difference
method ('t' test) is used. The analysed data is given under,
in the form of a Table.

TABLE 4.24 Mean and Standard deviation and 't' values obtained
in respect of boys and girls on pre and post attitude
measures(Experimental group)

SEX	No.	Pre-Attitude		Post-Attitude		't' Value	Levels of Significance	
		Mean	σ	Mean	σ		0.05	0.01
BOYS	16	53.8	8.10	75.05	6.29	*11.8	2.13	2.95
GIRLS	10	61.3	7.20	81.53	6.20	* 9.91	2.26	3.25

* obtained value of 't' is significant at 0.01 level.

The 't' values obtained in boys as well as in girls were found
to be highly significant at both the levels of significance.
The mean values obtained at the post-attitude test in case of
both boys and girls were found comparatively superior to the
mean values obtained at pre-attitude test. Hence the Null
Hypothesis is rejected and an alternative Hypothesis stating,
there is a significant difference between the pre and the post
attitude performance of both boys and girls is upheld. This
clearly points to the effectiveness of the curriculum on the
attitudes of both the sexes, by bringing about an improvement
in their attitudes towards their- self, opposite sex members,
sexual matters, marriage and Family.

The hypotheses 4.15 and 4.16, since the N's

The hypotheses 4.15 and 4.16, since the N's of two independent samples are small, the formulae 57 and 58 (Garrett 1979) were used.

$$S.D. = \sqrt{\frac{\Sigma (X_1 - M_1)^2 + \Sigma (X_2 - M_2)^2}{(N_1 - 1) + (N_2 - 1)}} \qquad (57)$$

$$SE_D = SD \sqrt{\frac{N_1 + N_2}{N_1 N_2}} \qquad (58)$$

wherein the true SD is estimated by pooling the sums of squares of the deviations taken around the means of the two groups and a single SD is computed. The mean difference between boys' and girls' scores on Attitude test is tested for significance. Analysis of data in respect of testing the above hypotheses is presented in the tables 4.25 and 4.26 which follow.

TABLE 4.25 Mean, standard deviation and 't' values in respect of pre attitude test for boys and girls(Experimental group)

SEX	N	Pre-Attitude Test		't' Value	Levels of Significance	
		Mean	σ		0.05	0.01
BOYS	16	53.8	8.10			
				@2.30	2.06	2.81
GIRLS	10	61.3	7.20			

@ obtained value of 't' is not significant at 0.01 level.

As indicated in the Table 4.25, it is clearly evident that the obtained 't' value is though significant at 0.05 level, but not significant at 0.01 level. Looking into the mean values, though

girls' mean performance is found to be superior when compared to boys' mean performance, there is very little difference observed between both the mean performance. So, it may be concluded that the difference obtained between mean performances of boys and girls on the Pre-attitude test is not significant. Hence the Null Hypothesis is retained.

The following Table 4.26 represents the analysed data to test the Hypothesis 4.18

TABLE 4.26   Mean, Standard deviation and 't' values in respect of post-attitude test for boys and girls (Experimental Group)

SEX	N	Mean	S.D.	't' value	Levels of Significance	
					0.05	0.01
BOYS	16	75.05	6.29			
				*4.81	2.06	2.80
GIRLS	10	81.53	6.20			

* obtained 't' value is significant at 0.01 level.

As can be seen from the Table 4.25, the 't' value is significant at 0.01 level of significance. The mean performance of girls is found to be superior to the mean performance of boys. Hence the Null Hypothesis is rejected and an alternative hypothesis stating that there is a significant difference between boys and girls with respect to mean performance on post-attitude test is upheld.

Section 3

4.5 EFFECTIVENESS OF THE CURRICULUM IN TERMS OF STUDENTS'
REACTIONS

As mentioned, the effectiveness of the curriculum
was measured in terms of students' reactions. The Reaction
Scale administered to students (Experimental group) measured
their reactions towards

i) the curriculum as a whole;

ii) the instructional methods used;

iii) the content; -

iv) Who should teach the course 'Family Life Education';

and v) whether it should be a separate course or treated
as an integral part of other subjects taught.

The responses sought under these five themes were categorised
accordingly and presented hereunder, with the questions posed.

1.0 Reaction towards the Curriculum as a whole:

1.1 This course a) impresses me a lot b) fairly impresses me
c) I feel quite ordinary d) doesn't impress me at all.

1.2 In this course, I have a) learned a lot b) learned a
few things c) learned nothing.

1.3 While hearing to certain units a) I felt excited as I
was learning something new b) I was bored c) never
felt anything novel about them.

As regards the item 1.1, 70% of the students were
very much impressed by the curriculum. About 20% of the students
felt it quite ordinary and about 10% of the students have

expressed that they are not impressed by the course at all. To the item 1.2, about 91% of the students have expressed that they had learnt many things by undergoing the curriculum and 10% of the students have expressed that they have not learnt anything new. To the item 1.3, about 80% of the students have expressed that they felt excited as they were learning something new and 10% of the students have expressed that they never felt anything new or novel about the course material and the rest 10% of the students have expressed that they felt bored. These reactions of the students serve as one of the criterion to validate the effectiveness of the curriculum.

2.0 <u>Reaction towards the Instructional methods used:</u>

    A. <u>Lecture method</u>

2.1 If I were the teacher, I would do a) more lecturing, b) less lecturing c) about the same amount of lecturing.

2.2 You may remember that certain things in Human Reproduction, Sex determination, Developing self-concept and so on, were explained by your teacher with the help of black board. How did you find the explanations given by the teacher?

2.3 Do you think you should have been involved to a great extent?

      As regards the sufficiency of lecture given by the investigator(2.1), about 72% of the students have felt it sufficient and expressed that they would do the same amount of lecturing had they been teachers. About 20% of the students have felt that it would have been better if the number of lectures were reduced and in place of that, slides were shown. Regarding the explanation given by the investigator (2.2), about 95% of the students have responded positively. Onely one student has expressed that the lectures were dull and non-interesting. The

reasons given by those who have shown positive reaction are
i) it helped them to know many informations of which they were
ignorant; ii) lectures were pretty brief, yet contained all funda-
mental concepts; iii) lectures were quite knowledgeable, interest-
ing and expressive.

These reactions of the students validate the assumption
on which this method was chosen to teach particular units in the
Curriculum.

As regards the item 2.3, about 20% of the students have
felt that they were involved to a great extent, during lectures
as the speakers constantly called for students' responses to cer-
tain points, in the form of comments, discussions, questions and
so on. One more reaction of the same kind holds the reason that
the explanations were quite satisfactory and contained all answers
to their questions which naturally doesn't require students' invol-
vement during lectures. About 80% of the students have opined
that there should have been more of students' involvement during
lectures. The reasons by these students were i) questions would
have helped to discuss certain points better; ii) if all the
students were involved seriously in discussion, posing questions
and so on, may be the programme would have been more successful;
iii) though the explanations were very interesting and convincing,
the teachers were very fast in their delivery of lectures. Hence,
it would have been nice, if students were involved in between,
in order to clarify their doubts and misconceptions.

From these reactions, it is evident that students' par-
ticipation during lectures, should be given prominence. But it
may be mentioned that students' participation to a great extent
was not possible, especially when lecture method was planned,
because the duration of each class was only for forty minutes,
during which, the lecture was planned for thirty minutes and the
other ten minutes was allotted for students' questions and answer

session. During the question and answer session, it was tried best to clarify the doubts of students and answer them. Though attempts were made to involve all the students in discussion, it wasn't successful due to time constraint.

B. Use of Transparancies

2.4 Certain units like "male and Female Reproductive System", "Human Development" and so on, were explained to you through projecting the teaching points and the diagrams(transparancies were used). What do you have to say regarding the use of these transparancies followed by explanation?

As regards this, almost all students have favoured the use of transparancies in teaching the units. Majority of their reactions were as follows:

i) Helped to make the concepts clear and could grasp the matter quickly.
ii) Found it easier to understand the difficult biological concepts.
iii) Best way of teaching
iv) Diagrams were big and colourful, saves lots of time as one can learn better and easier this way.

One of the students has remarked that diagrms should have been given shades to give better presentation. Two students, though they favoured transparancies, felt that it would have been more effective if slides and films were used in its place. These above reactions clearly indicate that students favoured the use of transparancies in teaching, as the use of transparancies to explain the content, helped them to understand in an easier and in a better manner.

c. Use of Slides

2.5 Certain concepts in the Male and the Female Reproductive
     System and the menstrual phases were explained to you by
     projecting the slides related to them. What do you have
     to say regarding the use of slides? Were they clear to
     you? Could you understand from them what your teacher
     was trying to explain?

        As regards the above item, about 80% of the students
have showed positive reaction. The main reason behind this re-
action was, it helped them to understand things better. Most
of the students have found them very impressive. One of the
students has suggested that the use of slides should be the
prominent feature of teaching such biology units, besides lectures.
Because, it helps those students who fail to understand the sub-
ject matter by lecture method. About 20% of the students were
neutral in their reaction. They have expressed that certain
slides were clear and certain slides were not. It was felt
from their reactions that they could understand the matter some-
what better because the slide projection was accompanied by ex-
planation, otherwise, the slides were not comprehendible in
their opinion.

D. Use of Charts

2.6 The Unit "Pregnancy and Child Birth" was taught by using
     the colourful charts in your classroom. How did you like
     them? What do you have to say regarding the use of those
     charts?

        About 90% of the students found the use of charts
very effective and comprehendible. Majority of them have expressed
that the charts were big and colourful and were very useful in
understanding the structure of reproductive organs and child
development. They had also felt that it improved their knowledge

about the subject and helped them to know certain things that they wanted to know. Another student has suggested that more charts could have been showed with detailed explanation. About 20% of the students have expressed a kind of neutral and a negative reaction. The students who had taken a neutral position did not specify any reason and those who reacted negatively have expressed that the pictures were nauseating.

2.7 What did you feel about the pictures related to Venereal Diseases(V.D.) were shown to you?

Regarding the slides and the pictures of V.D., about 80% of the students have shown a positive reaction, saying, it wasn't terrifying or nauseating. It was rather interesting to know how the organs get infected by V.D. and it was very clearly shown in the slides and in the pictures. About 10% of the students had reacted neutrally. One of the students who had reacted neutrally, has expressed that certain pictures were nauseating whereas certain others were not. The other 10% of the students had reacted negatively and never mentioned any reason for their negative reaction. Totally, it was felt that the students were quite positive about their response to the knowledge of V.D. and were impressed by the media used to teach the unit.

Self Instructional materials

E. Deviated Programme Learning Material(PLM)

Sometimes for example, when you studied topics like "Development of self"; "Understanding one'self" and certain sub-units in Human Reproductive system, you had a different experience. Here, the information related to an idea was presented through small paragraphs in an informal way (as if the teacher is speaking to You). Soon after the explanation of particular ideas in these paragraphs, there were few questions. You were asked to answer those questions and then check your answers with those given in the material.

2.8 What do you think of the material supplied to you?

2.9 Did you think that it is just like going through the text book or class notes, except for the activities and questions given in the material?

For these questions, about 96% of the students have responded saying, it is very different from the text books as the facts are presented in a very simple and in an informal way, whereas the text book presentation doesn't clarify the meaning of most of the scientific terminology used without any logical sequence in the presentation of facts and the concepts were presented very abruptly and so on. A few more reasons given by those who favoured the deviated PLM are:

i) facilitates rememberance of the concepts;

ii) reads quite simple and interesting;

iii) systematically planned and could grasp the matter easily;

iv) most of the scientific terms were explained in a quite simple and a comprehendible manner, which is not so in the text books;

v) simple and lucid diagrams embedded in the learning material helped them to understand the concepts without much difficulty; and

vi) intermittent questions and summaries helped them in recalling and revising and lastly, the facility for in-built mechanism through correct answers.

To know whether they would like all the units presented in the same form, the following questions were asked:

2.10 Would you like to have the ideas presented in the same form?

    i) in all the units   ii) in a few units.

For this, 60% of the students have preferred most of the units to be presented in the deviated Programme learning Material (PLM) form, whereas the remaining 40% of the students have opined that

it would become very monotonous if all the units are presented
in the same way, though the presentation is very interesting and
easily comprehendible. Their reason is, it would be fun and an
enjoyable experience to learn new things presented in a noveltic
manner using different methods.

F. Use of Diagrams in the material supplied

In all units supplied to you, diagrams have been used to
illustrate certain points.

2.11 What have you to say about the diagrams presented in the
learning material?

2.12 What did you feel about the diagrams given in those units
regarding the biological aspects? Was it i) embarrassing
to you, as a form of pornography? ii) scientific and never
felt awkward about it iii) a kind of entertainment to laugh
at.

As regards the item 2.11, about 86% of the students
have responded, whereas the remaining 14% have not responded.
Those who responded have reacted positively. The two reasons
felt by almost all students are i) very effective as it is easy
to understand the concepts through the diagrams, ii) the concepts
were more clear and one could understand what has been conveyed
in the material through the diagrams. One student though pre-
ferred the diagrams in the material, suggested that slides and
transparancies were more effective. Coming to the item 2.12,
almost all students have felt it quite scientific and have never
expressed any negative reaction towards the diagrams presented
in the material.

G. Dialogue form

You have learnt certain sub-units in Biological and
psychological self, through dialogue-form. Here the presentation
was through the conversation taking place between the two

individuals like Teacher and pupil, Doctor and the pupil, where
the Teacher and the Doctor answer the questions of the pupil.
The explanations given by these people, consisted of main ideas
of the units.

2.13 Were you able to understand the matter presented in this
form? YES/NO

2.14 Do you think that the dialogue stretched too much between
the two speakers, to explain a particular idea?

2.15 Do you prefer other methods which were used in the course
to this?

As regards the Question 2.13, about 70% of the students
answered quite positively saying, they were quite impressed by
the method used. They felt that the questions posed by the stu-
dent to his father and the Doctor, were almost the reflection of
their own questions which they would have asked. The other 20%
of the students(boys) had reacted negatively saying, it was
boring to go through the whole conversation taking place between
the speakers, in order to understand the main content, though it
was a good approach to be used. The remaining 10% had not res-
ponded to the question. Regarding the Question 2.14, the same
70% of the students had reacted saying, the conversation wasn't
stretching and was quite adequate to explain a concept. 20%
of the students who reacted negatively answered, that it was
too long which was the main reason for the boredom and suggested
that it could have been short. As regards the item 2.15, 70%
of the students who reacted positively to the earlier questions,
expressed that it was pretty interesting and a novel experience
to go through such a presentation and suggested that this method
should be used, wherever the difficult concepts arose. The rest
20% of the students felt it too elementary and preferred dis-
cussion and lecture method to this.

H. Assignment Method

For certain concepts like Hernia, multiple births and
so on, you were asked to collect relevant information and details
on your own by contacting relevant sources like Library, Psychia-
trist and Doctors, after which you were asked to prepare a detailed
paper and present it in front of your classmates. Regarding this,

2.16 Did you find it interesting to gather information and
details by contacting the relevant sources recommended
to you?

2.17 Did you feel that you were wasting time on this activity
of finding out facts about a particular theme by yourself?

2.18 Do you think that you were able to learn a lot through
this approach?

2.19 Did you understand when your friends presented the paper
after collecting the relevant facts on the topic assigned?

2.20 Do you think that most of your questions were answered by
your friend who presented the paper or by the teacher who
was helping your friend at times by explaining a few points?

For the question 2.16, 60% of the students have reacted
saying it was very challenging and interesting to gather informa-
tion and facts by contacting relevant sources like library, phy-
sicians, and looking into the related medical and science journals
and so on. They never felt it as a waste of time, in fact, felt
very happy as they were learning on their own. The remaining 40%
of the students have responded saying, it was difficult to contact
the sources to get the information and yet considered it a waste
of time and preferred learning a new topic either through lectures
or self-instructional material. One of the students has remarked
saying, it is impossible to spend time on learning a new topic
by discovering the facts on one's own, especially when other school
subjects had to be attended upon. As regards the other three
items, about 50% of the students have reacted that they were able

to understand the topic when their friends presented their paper and their questions were also been answered very well. They felt that they were able to learn quite well through this approach, whereas the remaining 50% of the students have felt that they were not able to learn that well through this approach, as they were not able to comprehend the matter when their friends presented the matter. They mentioned that it was too ambigious and difficult to understand and were not able to pose any questions either to the friend or to the teacher, as they first of all, did not understand the topic.

I. Summary Presentation

Certain concepts in units like "Population Control and Sex determination" and Sex differenciation were taught by explanation and using the black board and after which a summary of whatever taught, was given to you. This was just a brief presentation of the whole topic taught, without any additional illustrations, and diagrams, exercises.

2.21 In what way did the summary at the end of explanation of the topic help you?

2.22 Should the summary be more detailed?

2.23 Do you prefer any other method to this?

For the above 3 questions, most of the students, that is around 79% of them did not prefer the summary form of presentation, though the topic was explained prior to that by the teacher. They definitely seem to be preferring the matter to be presented in the form of deviated PLM. The reasons spelt out were i) Though the summary was given after teacher's explanation which was quite elaborate, it was difficult to remember the minute details and the meaning of certain terms at the time of criterion tests, ii) It wasn't interesting to go through the material in which diagrams, questions and answers and exercises were not given. iii) prefer a detailed material rather than a short summary

which is too brief. The remaining 21% of the students were
quite neutral in their reactions and mentioned that they didn't
go through the material and hence, not in a position to react
to it.

J. Films on Reproduction

2.24 Do you think that a film on "Human Reproduction" should
have been shown to you? YES/NO. Why?

About 76% of the students have expressed that they
should have been shown the film on Reproduction. About 24% of
the students have expressed that there wasn't a need to be shown
a film on Reproduction. Those who had expressed positively have
given the reasons like, different phases of reproduction, and
V.D. would have been more clear in the film, as the films are
more realistic. In addition, they have felt that it would reduce
the teacher's work. Those who have not preferred to be shown
the film have given the following reasons: i) heard that the
film is not good, creates a kind of nausea and one could learn
very well through lectures, slides and transparancy pictures,
about these topics. ii) One may get terrified to see the actual
film, though one has the knowledge about it. All those who have
expressed negatively are of the general opinion that it is not
at all necessary to be shown a film, as everything is quite
clear in the slides and in the pictures.

K. Use of Family Planning Devices

2.25 To explain the topic "Population Control and Family
Planning", certain family planning devices were shown to
you. What do you have to say about these?

As regards this, about 95% of the students have shown
a positive reaction. Only one student has shown a neutral re-
action and has not given a reason for the position he has taken.
Those who expressed positively hold the following reasons:
i) understood the topic better with the help of devices which
wouldn't have been possible otherwise, just through the pictures.

L. Questions and Exercises given in the materials

2.26 Did you answer the questions which came in between the
learning material? YES/NO

2.27 Did you check your answers with those given after the
Questions? YES/NO.

As regards the questions given after each concept
followed by correct answers, about 72% of the students have given
a positive reaction saying that they used to answer the questions
and check for the correct answers. About 10% of the students
have reacted neutrally saying, whenever they found time, they
answered the questions, but couldn't answer all the questions,
due to lack of time. About 18% of the students have responded
saying, that they never attempted to answer the questions.

Exercises on Personality Development

2.28 As you went through the learning material, sometimes soon
after you learned a particular point, an exercise on it
was given (units on Perception of the Self and the Others).
Did you work those exercises?

2.29 Did the exercises given on self-concept help you to find
out what kind of a person you are?

2.30 Did this activity take away much of your time at Home?

2.31 Do you think there could have been a group discussion
on this, so that you'll learn more about your friends, and
your friends about you?

Regarding the item 2.28, about 80% of the students had
responded saying that they did the exercises regularly given on
"Personality Development" unit, whereas the other 14% of the stu-
dents had expressed that they couldn't do the exercises. One
student among them has expressed that he worked very little on
the exercises. One student has expressed that he worked them
orally and discussed the points with his own self. As regards

the item 2.29, where the question like whether exercises given
on self-concept helped them in finding out what kind of persons
they are, is asked, about 86% of the students have responded
positively and the rest 14% have reacted negatively. Those stu-
dents who had showed positive reactions have expressed that work-
ing out the exercises on self-concept have helped them to under-
stand and analyse their own selves and to know what they are and
where they stand. One of the students has expressed that it had
helped in increasing the awareness to know themselves and over-
coming their weak points. Those students who had reacted nega-
tively have not given proper reasons. Two students among them
have come out with reasons like, it had not helped them much
and they couldn't go through the learning material completely.
Regarding the item 2.30, wherein the pupils were asked, whether
working out the exercises and activities take away much of their
time, about 81% of the students have reacted saying, it didn't
consume much time and it is rather interesting to work out the
exercises and the activities. One student reacted saying that,
it did take away much of their time, though it was interesting
enough. About 14% of the students have reacted neutrally, saying,
at times it did take sometime of theirs, though not all the hours.
As regards whether they would have preferred a group discussion
on personality development to learn more about their friends(2.31),
about 81% of the students had reacted saying that they would
have preferred group discussion related to understanding oneself
and others. The other 19% of the students have felt that it
wasn't necessary. They hadn't specified their reasons for re-
acting so. One of the students who had preferred group discussion,
has suggested that two or three units more, should be added to
understanding oneself and development of self, so that it may
help students in understanding themselves more and in developing
a healthier personality.

M. <u>Discussion Session</u>

As regards this compondnt, five questions were asked which are as follows:

2.32 In every unit you studied in this course, discussions on various points of each unit were held either asthe unit went on, or at the end of the unit. During these discussions, you were free to raise questions to clear doubts regarding the topic, to raise new questions which would help in knowing more about the topic. In what way did the discussions in the class help your with regard to the following:

a) Clarifying doubts and certain misconceptions.

About 80% of the students had expressed that discussions in class have helped them a lot, clarified most of the misconceptions that they were holding, many biological terms were made clear and they were able to comprehend much in detail during discussion. About 20% of the students have answered saying, it was very confusing, especially when their other friends brought in many doubts and informations for discussion, which they couldn't comprehend.

b) Set you to think further about the particular topic discussed.

As regards this, about 70% of the students have expressed that it did set them to further thinking, the result of which is, they used to discuss with their friends about certain issues related to the topic. The other 30% have responded saying that, they never thought much about the issues after the discussions were over in the class.

c) Helping you to read more regarding the particular topic discussed.

About 85% of the students have reacted saying, they ventured to read few books and the articles on certain topics which were recommended by the teacher and also provided by the Library;

also read the articles displayed on the Bulletin Boards of Biology Lab. About 10% of the students have reacted saying, they couldn't find enough of time to do further reading, though they were interested in reading the books and the articles recommended. The rest 5% of the students had not responded.

d)   Changing your opinions and attitudes which you were holding towards a particular aspect, before the unit was taught.

As regards this, about 81% of the students have expressed that the knowledge provided, clarified certain beliefs and misconceptions which were held initially, thereafter which resulted in change of opinions and attitudes. About 19% of the students were quite pertinent in saying that, they never viewed sex or the related aspects in a negative way, hence the question of change in opinions and attitudes doesn't arise in these students' case.

e)   Probing you to discuss with your friends and people at Home.

As regards this, about 24% of the students have expressed that they were not able to discuss either with their parents or with their friends. The reasons were not mentioned for this reaction. The rest 76% of the students have expressed that, they could discuss freely and frankly with their friends, whereas with their parents, they could discuss occassionally, but not in a frank manner.

The students were asked to spell out their reasons, if they had not participated in the discussions. For this purpose, the following questions were given.

2.33 You might have not participated in the discussions to a great extent. If so, what are the reasons?

As regards this, about 82% of the students had reacted saying, that they participated very actively and frankly with a view to learning more. About 12% of the students had reacted expressing that they couldn't participate in the discussion to a

great extent. The reasons behind their response are the following.
i) Conscious of the questions to be asked ii) Never got time
to participate as many other students were participating iii) could
understand the content quite well, hence never felt the necessity
to ask questions or to participate.

2.34 Did you think it was waste of time to discuss topics which
      were not related to your school subjects? YES/NO. Why?

       About 90% of the students have reacted positively say-
ing that they never considered it a waste of time. On the con-
trary, they enjoyed learning all the new topics, along with the
Biology units. The reasons behind their reactions were i) it is
necessary to know about one's physiological self and its role in
personality development; ii) topics included were as important
as the topics given in the Biology text book; and iii) it not
only helps to understand one's self, but also others' psycholo-
gical selves.

2.35 Were you interested in learning and discussing only those
      topics which x were in your Biology text book.(Human Deve-
      lopment, Sex determination and Sex differenciation, Popu-
      lation Control and Family Planning), but not the other
      topics which were taught in the course? YES/NO. Why?

       About 95% of the students have reacted expressing that
they were interested in the entire course that was taught. Be-
sides this general reaction, there were other special reasons
also quoted by them. They were i) though certain units are not
very much related to the school subjects, they are very useful
and every student ought to know such things which may help in
his healthy growth; ii) helps in clarifying many doubts and false
opinions one has about oneself and knowing the true inner self
of one's own. One of the students had expressed that, the units
other than Biology units were interesting to learn through dis-
cussions, rather than going through the material. The other 10%
of the students had expressed that they are exam oriented and

they couldn't get themselves to learn the topics other than
the biology ones, as they felt that they may be wasting their
time, though they knew that all the units were interesting.
From the above reactions, it is generally understood that stu-
dents felt interested in the course.

Discussion with friends outside the classroom

2.36 Though you found yourself not interested in participating
in the discussions held in the class, did you try to dis-
cuss with your friends, outside the classroom while going
home or during your leisure time? YES/NO. If yes, what
made you discuss?

It was felt that certain students who were not interested
in discussing the issues in the classroom, may be discussing them
outside the class room with their friends. Based on this assump-
tion, the above question was asked for which most of the students,
around 80% of them had answered that they never hesitated to dis-
cuss frankly in the open class room itself. One among those who
responded reacted saying that though he was interested in dis-
cussing with his friends, he couldn't as he felt that his friends
lacked the knowledge about certain issues. One of the students
had mentioned that he not only discusses with his friends, but
also with his parents.

The following question was posed to those who were not interested
in discussing in the classroom as well as with their friends.
That is,

2.37 In case, you had never felt like discussing even with your
friends, did you atleast went on pondering in your mind
about the points taught in the class? YES/NO. Why?

About 20% of the students have reacted saying that they
did ponder about certain points and issues in their mind. One
of them had specified that, he used to think about the issues
concerning venereal disease and so on, which he was neither able
to discuss in the classroom nor with friends.

The following question was asked to know if the students had many questions to discuss in the classroom with the teacher.

2.38   Did you have many questions in your mind to put forward and discuss in the class with your teacher. If yes, did you ask those questions and participate in the discussion? If no, why?

About 67% of the students have reacted saying that they never had any questions. The following reasons were given for their response. i) Questions were answered in the class when the other students asked almost the same questions to the teacher, which the teacher answered. ii) Topics were explained quite well, so there were no doubts nor any questions. iii)Wherever the questions and doubts arose, the written materials helped. Along with this, is also mentioned that reading the recommended books and articles have helped. The other 33% of the students who had reacted saying, they did have certain questions, did not give any additional reasons or comments.

During the Curriculum implementation, the investigator noted that certain students come individually to ask certain questions or to clarify certain doubts to the teacher. These questions and doubts though answered to the students individually, were taken as a general problem and discussed in the open class room. To know students' reaction towards this, the following question was posed.

2.39   Many times, you must have discussed certain points with your teacher personally. How did you feel when these questions were taken up for discussion in the class?

For this, about 75% of the students have expressed that they felt interested when their questions were taken up for discussion in the open class room. They expressed that their questions were explained and discussed more in detail, when the teacher took it up for discussion in the class room. About 10% of the students

have remarked saying, their questions were not taken up for discussion, though the teacher answered them when approached individually, hence they had nothing in particular to react as such. About 15% of the students have expressed that they felt embarrassed when their questions were taken up for discussion.

Benefits of Participation

To know whether participation in discussion helped the students, the following question was posed.

2.40 Your friends too asked many questions and participated in the discussion. In what way, did this participation help you?

For this, about 95% of the students have expressed that others' questions and participation in the discussion helped them in increasing their knowledge and clarifying many doubts. One boy student remarked that one could gain much from girls' questions and their participation, than from the boys' participation in the discussion. The other student had remarked that his classmates' questions and participation in the discussion were boring and dull, therefore, he couldn't gain much from them.

Discussion with opposite sex members

2.41 Regarding this, the following question was posed. After undergoing this course, do you feel free enough to discuss about related issues to sex and so on, with your opposite sex member? YES/NO. Why?

About 81% of the students had responded to this question. Among them, 53% of the students (30% boys and 23% girls) had reacted positively saying, they did feel like discussing freely with their opposite sex members. About 28% of the students of which 10% were girls and 18% were boys had responded neutrally. Those girls who responded neutrally gave the following reasons. i) Felt shy and embarrassed to discuss certain issues with the opposite sex members. ii) Would like to discuss only when the

opposite sex member is interested. Those boys who responded neutrally gave their main reason as, they do not have many opposite sex members as friends, who are quite open minded. The students who reacted positively have expressed that they treat the issues in a very scientific way. Hence, they did not feel hesistant to discuss with their opposite sex members.

3.0 Reaction towards Criterion Tests

3.1 When you were asked to prepare for the test after every unit that was taught, did you find it waste of time to spend on reading the material given? YES/NO. Why?

As regards this, about 95% had responded. Among those who responded, about 15% of the students have showed negative reaction and the rest 80% of the students have showed positive reaction. Those who reacted negatively have not given their reasons, whereas those who reacted positively have listed their reasons as follows:

i) it served as a kind of self evaluation and helps to know exactly how much one is able to understand, hence it is essential to have criterion test at the end of each unit;

ii) it wasn't a waste of time, as the material was written in a simple and in a comprehendible language, which was easy to go through. It wasn't like a text book or the usual notes given by the other teachers, but it was like a discussion of certain relevant issues and concepts.

4.0 Guest Lectures

You might recall that you had the experience of listening to two medical Doctors who gave a talk on "Pregnancy, Child birth and Lactation". They discussed with you many points of importance in this topic.

4.1 How far this talk was useful to you?

4.2 Do you think it would be beneficial if talks of such kind by medical doctors are arranged on several other topics?

4.3 Did it generate an interest or a curiosity in you to read
     further about this particular topic?

4.4 Did you feel that these Doctors used too many medical terms
     which you couldn't understand or do you think they were too
     simple in their explanation that everybody could understand?

4.5 Were your questions sufficiently answered by these Doctors?
     Were you pleased or displeased? Give your reasons.

        Regarding the question 4.1, about 91% of the students
had expressed positively, whereas the rest had shown a negative
response, but failed to give any reasons for their negative res-
ponse. Those who gave positive reactions have laid their main
reason as , it helped them in clarifying many doubts and mis-
conceptions. Regarding the question 4.2, about 67% of the stu-
dents have reacted saying, it wasn't difficult to understand
their talks, whereas the other 23% of the students have expressed
that it was difficult for them to understand their talks. Those
who reacted positively, have expressed that their expl explanation
was quite simple. Those who expressed negatively have given
their reasons as i) terms used were very difficult. ii) Doctors
were confused about certain terminology among themselves, when
they were trying to explain to the students. iii) difficult to
remember, though they explained the terms in detail. Regarding
the question 4.3, 95% of the students have expressed that their
questions and doubts were well answered in detail, by the Doctors.
Regarding the question 4.4, about 58% of the students had res-
ponded, whereas the other 42% of the students had not responded
to the questions. Among those who responded, 95% of them have
reacted saying, they read certain articles related to the units
taught in magazines like Science today, Science Reporter and so
on. The rest 5% of the students have expressed saying, though
 the Doctors' talks and the whole course was inspiring and
generated an interest to learn further, they couldn't take trou-
bles to go in search of articles, magazines and books related
to the course, as they were too busy with exams preparation.

6.3 What did you feel when information regarding V.D. was given to you?

Regarding this item, about 95% of the students had reacted positively. One one student had reacted negatively. Those students who had reacted positively have expressed that it is essential for people to know about the diseases like V.D., so that it might prevent them from getting it and in case they get the disease they can recognise the symptoms and cure it before it is too late. The additional reasons behind their positive reaction were i) any additional knowledge is an asset ii) one can be free from wrong beliefs and mis-information, if they had the knowledge of V.D. iii) happy to learn this new subject which is not taught in the schools. iv) Knowledge of V.D. helps one to lead a healthy life, hence it is essential. v) It is a scientific knowledge and as important as the knowledge of other diseases, usually learnt. vi) essential for people to know about such diseases which reduces man to dust. One of the students has expressed that it is necessary for students of their age to know about V.D., so that they can prevent themselves from the disease, in case they are infected, it would prevent them from not consulting the doctor. Most of the students have expressed that they never had the idea of V.D. initially, even if few of them have had, it was a vague information gathered from unreliable sources. The student who had reacted negatively had not given any reason.

6.4 Do you find any improvement in your self after learning the units like "Perception of the self" and "Perception of the other"?

As regards this, almost 80% of the students responded positively saying, the units (Perception of the Self and Perception of the other) had helped them in understanding themselves and the others. It was expressed that the exercises and the group discussions relating to these have helped them in discovering

their inner self as well as in understanding others. Most of
them had expressed that they could understand and communicate
with their friends and people at Home in a better and in an easy
manner than before.

6.5 Were you observing yourself in daily life situations for
the defensive mechanisms that you may be adopting to defend
yourself.?

Regarding this, about 66% of the students have reacted
saying, they did concentrate on their behaviour for the exhibit
of defensive mechanisms which they may be adopting consciously
or unconsciously, in their day-to-day life, and tried their best
to avoid such defensive mechanisms and be true to their own selves.
Rest of the students have reacted saying that only sometimes they
could reflect on their behaviour after a particular situation had
occured where they were involved, where they consciously or un-
consciously displayed certain defensive mechanisms like rationa-
lisation and sublimation.

6.6 Were you observing and analysing others' behaviour in
certain situations, when they were using one of those
defensive mechanisms to defend themselves?

As regards this, about 80% of the students have expressed
that they found it very interesting to observe people, after
having undergone certain psychological concepts in knowing one-
self and knowing others. According to them, it was more inter-
esting to observe a person who was using defensive mechanisms.
About 20% of the students have responded saying that they obser-
ved occassionally. No reasons were mentioned for their response.

7.0 Family Life Education as a separate course or an integral
part of the school curriculum

7.1 Do you prefer Family Life Education to be conducted as a
separate course among the other school subjects or as an
integral part of the subjects like Biology and the other
subjects taught in the School?

As regards this, 80% of the students have felt that it would be better, if it is introduced as a separate course in the School Curriculum. The reason mentioned behind their reaction is, if it is an integral one, the subject teachers do not pay much attention to teach those units. According to them the teachers avoid it either due to their own inhibitions to teach the subject or due to the lack of depth in the knowledge in teaching particular units. About 20% of the students expressed that it should be an integral part of the school curriculum. One of the students has opined that it should remain a separate course for Commerce students as there is no scope for integrating the course in common subjects, unlike the science subjects have.

To know students' reactions towards who should teach the course, (whether the school subject teachers or school counsellor or some specialists from outside), the following question was asked.

8.0 If the course Family Life Education is introduced in your School, (either as an integral part of the subjects taught or as a separate subject), whom do you prefer to teach the course?

   a) your biology teacher;
   b) teachers from other discipline;
   c) your school counsellor; or
   d) specialist from outside.

   For this, about 66% of the students had responded whereas the other 34% of the students had not responded. Among those who responded, about 85% of them preferred the school Counsellor to deal with the subject. They have also expressed that the School Counsellor, instead of just dealing with the academic problems, should deal with the other crucial personality and emotional problems of the students.

9.0 On the whole, to know the general opinion of students about the Curriculum implemented, the following questions were asked.

9.1 Did you find the course too lengthy?

9.2 What are your suggestions to improve the curriculum?

9.3 After going through the experience of learning this new course, did you feel satisfied that it answered all your doubts and questions about yourself or did you feel that "after all, there was nothing much exciting"?

9.4 If you have anything more to say regarding the course you had undergone, you may mention here.

As regards the Question 9.1, about 70% of the students have felt that the course was lengthy, but they expressed saying, there could have been more of guest lectures and audio-visual programmes. One of the students had suggested that number of lectures should be reduced. About 30% of the students had felt that the course was little lengthy and it could be reduced by minimising the number of group discussions, though they were quite interesting and helpful. Regarding the Question 9.2, 95% of the students had responded saying, the course had been very helpful in knowing many basic facts of life and in improving their personality and in the better communication with people and understanding them. Their main suggestion was, the course should be taught to the future students also. Two students had suggested that the course should be taught to the school leaving students, as it will prepare them for future adulthood in all aspects. Regarding the Question 9.3, about 95% of the students have reacted positively saying, they were very pleased with the course as it clarified most of the misconceptions that they have had and helped them in developing the attitudes. It was also mentioned that, above all, the course developed an open mindedness

and a scientific way of looking at things which are usually
viewed in a very narrow way. One of the students had expressed
that it was very encouraging to get away from the taboos and
the other social inhibitions that they have been compelled
into, by the society. In sum, the reactions of most of the
students clearly indicate to the effectiveness of the Curri-
culam of Family Life Education.

Section- 4

The previous sections (1 to 3) dealt with the valida-
tion of the curriculum which was evidenced through the descriptive
and the inferential data obtained on the achievement, attitude
and the reactions of students. As mentioned earlier, the present
Section deals with the descriptive analysis of socio-economic
status and Family Adjustment of pupils belonging to both Experi-
mental and Control group.

4.6 DESCRIPTIVE ANALYSIS OF DATA FOR EXPERIMENTAL AND CONTROL GROUP ON SOCIO ECONOMIC STATUS

The Socio-economic status measured for Experimental
and Control group reveals the following.

In the Experimental group, 68.7% of the boys and 40%
of the girls fall under the category of High socio-economic sta-
tus, whereas in the rest 31.3% of the boys and 60% of the girls
fall under the category of middle socio economic status. In
the Control group, 81.25% of the boys seem to belonging to the
High socio-economic status, whereas 18.75% of the boys and the
total sample of girls seem to be falling under middle socio-
economic status. The data reveals that none of the students from

both the Experimental and Control group belong to the low socio-
economic status. The 4.27 represents the above obtained data.

TABLE 4.27   Socio-economic Status of Experimental and Control
             group

Socio-Economic Status	Experimental group		Control Group	
	Boys	Girls	Boys	Girls
High Socio-economic status	68.7%	40%	81.25%	-
Middle Socio-economic Status	31.3%	60%	18.75%	100%
Low Socio-economic status	-	-	-	-

4.7   DESCRIPTION ANALYSIS OF DATA FOR EXPERIMENTAL GROUP ON FAMILY ADJUSTMENT

As mentioned in the Chapter-3, under instrumentation,
the Family Adjustment Inventory is sectioned intro three, one
dealing with the relation with parents, two dealing with the
relations with brothers and sisters and three dealing with stu-
dents' adjustment at Home in general. For convenience purpose,
the scores obtained were converted into percentages. The Family
Adjustment of students was interpretted as follows. Between

        0 - 25   .. severely mal adjusted
        26 - 50 .. moderate Adjustment problems
        51 - 75 .. adjusted
        76 - 100 .. well adjusted

The following description gives a detailed picture of the Family
Adjustment of Experimental group. The Table 4.28 represents
the detailed analysis of family adjustment of Experimental group
students in terms of percentiles and mean values. As one can
see in the table, the scores obtained for both boys and girls

TABLE 4.28   Percentiles and the Mean Values of the Family Adjustment of the Experimental Group(Boys and Girls)

PERCENTILES	BOYS				GIRLS			
	SECTION I	SECTION II	SECTION III	TOTAL	SECTION I	SECTION II	SECTION III	TOTAL
P_{10}	71.0	67.5	72.5	71.0	62.83	69.5	69.5	69.6
P_{20}	75.0	79.75	79.9	75.0	66.16	72.83	81.16	71.5
P_{30}	79.0	81.75	83.1	79.0	69.5	76.16	82.83	73.5
P_{40}	81.83	83.75	86.3	82.3	72.83	79.5	84.5	75.5
P_{50}	84.5	85.75	89.5	85.5	76.16	82.0	86.16	77.5
P_{60}	87.16	87.75	91.5	88.7	79.5	84.5	87.83	79.5
P_{70}	89.9	89.5	93.5	91.5	82.0	87.0	89.5	84.5
P_{80}	93.1	93.1	95.5	94.16	84.5	89.5	92.83	89.5
P_{90}	96.3	96.3	97.5	96.83	87.0	94.5	96.16	94.5
MEAN	83.38	84.21	87.28	84.41	74.39	82.88	86.38	78.44

NOTE: Section I refers to the relationship with parents.
Section II refers to the relationship with brothers and sisters.
Section III refers to the Adjustment at Home in general.

reflect a highly adjusted behaviour in the family. It is observed
that almost all the boys are well adjusted in the family. This
is obvious from the scores obtained under the components, namely,
relations with parents, relations with brothers and sisters, and
Home in general and also from the total scores on the Family adjust-
ment obtained by boys. In case of girls, about 40% of them seem
to be adjusted whereas the rest 60% seem to be highly adjusted
with their parents. In case of their relations with their brothers
and sisters, almost 80% of them seem to be well adjusted. This
adjustment at home in general is also evidenced by almost 90% of
the girls who expressed high adjusted nature. Looking to the
total values of adjustment, it is again clearly evident that al-
most all girls are well adjusted in their family. The mean values
obtained by boys and girls under all components and total-wise,
show that, the boys and girls are well adjusted in their families.

4.8 DESCRIPTIVE ANALYSIS OF DATA FOR CONTROL GROUP ON FAMILY ADJUSTMENT

As one can see from the Table 4.29, though majority of
the boys and girls seem to be well adjusted, the scores obtained
are not as high as in the case of experimental group. Concerning
their relationship with their parents, 60% of the boys seem to
have expressed well adjusted nature, whereas the rest 40% of the
boys seem to be having adjustment problems. Regarding their
relation with their brothers and sisters, almost 60% of them seem
to be falling under 'adjusted' category; 20% of them under highly
adjusted and the rest 20% of them seem to be having mild adjust-
ment problems. Taking the scores of adjustment at Home, almost
90% of them seem to be well adjusted, though the scores don't ex-
ceed the value 78.3 which is observed at 90th percentile point.
On the whole, almost 80% of the boys seem to be well adjusted in
their families. In case of girls, almost all the girls seem to
be well adjusted with their parents, sisters and brothers. Their
adjustment at Home in general is evidenced by almost 80% of the
girls, whereas the rest 20% of the girls seem to be having slight

TABLE 4.2?   Percentiles and the mean values of the Family Adjustment of the Control Group. (Boys and Girls)

PERCENTILES	B O Y S				G I R L S			
	Section I	Section II	Section III	Total	Section I	Section II	Section III	Total
P_{10}	21.0	47.5	47.5	37.5	51.6	59.5	44.5	59.5
P_{20}	25.0	51.9	52.5	49.72	52.83	69.5	49.5	61.5
P_{30}	29.0	55.1	56.5	51.5	54.5	72.83	69.5	63.5
P_{40}	52.3	58.3	60.83	53.27	56.16	76.16	74.5	65.5
P_{50}	55.5	62.0	66.16	55.05	57.83	79.5	79.5	67.5
P_{60}	58.7	66.1	70.5	60.0	59.5	82.83	81.5	69.5
P_{70}	62.5	70.5	72.16	61.33	69.5	86.16	83.5	72.83
P_{80}	66.5	78.5	75.83	71.5	72.83	89.5	85.5	76.16
P_{90}	79.5	94.2	78.3	75.5	76.16	94.5	87.5	79.5
MEAN	48.93	64.68	63.18	58.9	60.1	76.5	72.3	69.7

NOTE :   Section I refers to the relationship with parents.
Section II refers to the relationship with brothers and sisters.
Section III refers to the Adjustment at Home in general.

adjustment problems. On the whole, almost all the girls seem
to be well adjusted in their families. This is clearly evi-
dent from the mean values obtained by both boys and girls, except
under Section-1, where the mean value obtained by boys is just
48.93.

These above descriptions clearly show that boys and
girls belonging to Experimental and Control group are well ad-
justed in their families, though the scores showing the adjustment
level vary for both the groups.

Section - 5

This section as mentioned earlier, deals with the
study of relationships between the variables chosen under study.
That is, the relationship between the socio-economic status and
Family adjustment, between Family Adjustment and Self-attitude
formation, between students' achievement and attitude. The
study of relationship between these variables was studied for
both Experimental and Control group. The study of relationships
between these variables is pertaining to the objectives, (3),
(4) and (5) of the investigation. In order to find out the
relationship between the above mentioned variables, the formula
of coefficient of correlation where the deviations are taken
from US means of two distributions was used. That is,

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \times \sum y^2}} \quad \text{(Garrett)}$$

4.9 STUDY OF RELATIONSHIP BETWEEN THE SOCIO-ECONOMIC STATUS AND
THE FAMILY ADJUSTMENT OF STUDENTS BELONGING TO EXPERIMENTAL
AND CONTROL GROUP

As mentioned in Chapter-1, it was felt that the indi-
cators such as socio-economic status, parential educational level
and occupation determine the home environment in which the
individual adjust or mal-adjust. Based on this assumption, the

relationship between the socio-economic status and the Family Adjustment of students was studied. To study this, the students belonging to both experimental and control group were considered. The following hypotheses were formulated to study the relationship between the socio-economic status and the Family Adjustment. That is,

H.4.17   There is no significant relationship between the socio-economic status and the Family Adjustment of boys and girls belonging to the Experimental group.

H.4.18   There is no significant relationship between the socio-economic status and the Family Adjustment of boys and girls belonging to the Control group.

TABLE 4.30 Correlation between Socio-economic status and Family Adjustment of Experimental and Control Group

SEX	N		Experimental		M		Control		'N'value		Level
			Socio Economic status	Family Adjustment		Socio Economic status	Family Adjust ment	Exp- eri men- al	Con- trol	Of Signi- ficance
										0.05	0.01
BOYS	16	m	27.44	56.35	M	27.9	58.9	.40	*-0.03	.497	.623
		σ	2.34	11.43	σ	2.08	11.7				
GIRLS	10	m	25.8	62.22	m	23.9	69.7	.05	*-0.09	.632	.765
		σ	2.44	8.70	σ	0.83	7.30				

* obtained value of 'r' is not found significant at both 0.05 and 0.01 levels.

The detailed analysis regarding the study of the relationship between both the variables in case of Experimental and Control group is presented in the table 4.30.

As the Table 4.30 reads, the obtained 'r' values for both boys and girls in Experimental and control group are not found significant at both 0.05 and 0.01 levels of significance. In case of boys and girls belonging to the Control group,

negative 'r' values of -0.03 and -0.09 are observed. Since the obtained 'r' values were not found significant in both Experimental and Control groups, the null Hypotheses stating that there is no significant relationship between the socio-economic status and Family adjustment of boys and girls belonging to both Experimental and Control group are accepted.

4.10 STUDY OF RELATIONSHIP BETWEEN THE FAMILY ADJUSTMENT AND THE SELF-ATTITUDE OF STUDENTS BELONGING TO EXPERIMENTAL AND CONTROL GROUP

As mentioned in the Chapter-1, the Family Adjustment of a person has a pervasive influence on his or her attitude formation towards his or herself. Based on this assumption, the Family Adjustment and the Self-attitude of students belonging to the Experimental and Control group was studied.

To study this, the pre test scores on Attitude (Section 1,2,3) which measures the attitudes towards the biological, psychological and the sociological selves were taken into consideration. To study the above relationship, the following Hypotheses were formulated. That is,

H.4.19 There is no significant relationship between the Family Adjustment and the self-attitude of boys and girls belonging to Experimental group.

H.4.20 There is no significant relationship between the Family Adjustment and the self-attitude of boys and girls belonging to Control group.

TABLE 4.31 Correlation between the Family Adjustment and the Self-attitude of Experimental and Control group

| SEX | N | | Experimental | | Control | | 'r'Value | | Level of significance |
			Family Adjustment	Self attitude	Family adjustment	Self attitude	Experimental	Control	0.05 0.01
BOYS	16	m	84.4	56.35	m 58.9	22.32	.73	.51*	.497 .623
		σ	8.02	11.43	σ 11.7	3.07			
GIRLS	10	m	78.5	62.22	m 69.7	16.9	.50	.81@	.632 .765
		σ	7.70	8.70	σ 7.30	3.11			

@ Obtained value of 'r' is significant at 0.01 level.
* Obtained value of 'r' is significant at 0.05 but not at 0.01 level.

From the Table given above, it is observed that the relationship
exists between the two variables, that is, Family Adjustment
and self-attitude in case of boys belonging to the Experimental
group and in case of boys and girls belonging to the Control
group. Since the value of 'r' .73 in case of boys belonging to
the Experimental group, and value of 'r' .81 in case of girls
belonging to the Control group were found to be highly signifi-
cant beyond the level of 0.01, the above stated Null Hypotheses
are rejected, and alternative Hypotheses stating there is a sig-
nificant relationship between the Family Adjustment and the
self-attitude in case of boys belonging to the Experimental
group, and there is a significant relationship between the
Family Adjustment and the self-attitude in case of girls belong-
ing to the Control group are upheld. In case of boys belonging
to the Control group, the obtained 'r' value of .51 is found
significant only at 0.05 level of significance, but not at
0.01 level of significance. However, since the 'r' value of
.51 is found significant at 0.05 level of significance, the
Null Hypotheses is rejected and an alternative Hypothesis
stating there is a significant relationship between the Family
Adjustment and the self-attitude of boys belonging to the Con-
trol group is upheld. On the contrary to the above obtained
findings, the 'r' value of .50 obtained in case of girls belong-
ing to the Experimental group is not found significant at both
0.05 and 0.01 levels of significance. Since the 'r' value was
not found significant, the Null Hypotheses stating, there is no
significant relationship between the Family Adjustment and the
Self-attitude in case of girls belonging to the Experimental
group is retained.

4.11 STUDY OF RELATIONSHIP BETWEEN THE ACHIEVEMENT AND THE
ATTITUDE OF STUDENTS BELONGING TO THE EXPERIMENTAL AND
THE CONTROL GROUP

Since the curriculum strategy was provided for students
to acquire the knowledge regarding one'self(biological,psycholo-
gical and social), perception of the other, building up relations,

Human sexuality, biological, psychological and the sociological aspects of the family, it was assumed that there could have been some alteration at the existing cognitive structure of students, which might have influenced the attitudes of students towards those particular concepts, either in a positive or in a negative way. Hence the relationship between the Achievement and the Attitude of student was studied. To study the above relationshøp, the scores obtained by students belonging to Experimental and Control group on the post tests of comprehensive and the Attitude were taken into consideration. In order to study the above, the following Null Hypotheses were formulated.

H. 4.21   There is no significant relationship between the achievement and the attitude of boys and girls, belonging to the Experimental group.

H.4.22   There is no significant relationship between the achievement and the attitude of boys and girls, belonging to the Control group.

The data obtained for both Experimental and Control group is presented in a detailed way in the Table 4.32

TABLE 4.32 <u>Correlation between the Achievement and the Attitude of Experimental and Control group</u>

SEX	N	Experimental		Control		'r'value		Levels of significance	
		Achieve-ment	Atti-tude	Achieve-ment	Atti-tude	Exp eri mtl.	Con-trol	0.05	0.01
BOYS	16	m 74.53	75.05	m 23.8	48.9	0.73*	0.23	.497	.623
		σ 8.28	6.29	σ 5.30	6.2				
GIRLS	10	m 54.32	81.53	m 21.8	50.58	0.79	0.05	.632	.765
		σ 9.05	6.20	σ 5.60	4.35				

* Obtained 'r' value is significant at 0.01 level

In the above presented table, one can see that the 'r' values
of 0.73 and 0.79 obtained for boys and girls belonging to the
Experimental group are found significant at 0.05 and 0.01 levels
of significance, whereas the 'r' values obtained for boys and
girls belonging to the Control group is not found significant.
This shows that the students belonging to the Control group had
hardly any knowledge about the concepts measured, hence the in-
congruence between their achievement and attitude, whereas the
findings obtained by the Experimental group supports the hunch
that knowledge acquisition in any field or area through planned
curricular activity or proper usage of media influences the atti-
tude of the individual towards the particular concepts measured.
Hence the null Hypothesis in case of Experimental group is rejec-
ted and an alternative Hypothesis stating that there is a rela-
tionship between the achievement and the attitude of boys and
girls belonging to the Experimental group is upheld, whereas
in case of Control group, the null Hypothesis stating there is
no significant relationship between the Achievement and the
Attitude of boys and girls belonging to the control group is
retained.

4.12 DISCUSSION

The data evidenced descriptively and inferentially
in all five sections of the present chapter, paves way for
the following discussion.

The effectiveness of the curricular in terms of
students' achievement on criterion test, shows that excepting
the first, fourth and the seventh criterion tests, quite a high
performance has been observed for rest of the units. The mean
values obtained for those units, where a high performance was
observed, were above 60 . The instructional inputs used in
these units were, Dialogue form, discussion session, Exercises
and Deviated Programmed learning method. The various instruc-
tional inputs used to teach these units, must have had a positive
influence over the performance of the students. The units

(Biological self- the male and the female), Human Development, venereal diseases) tested by the criterion tests 1,4 and 7 show an average performance. In the first two units(biological self-the male and the female), the Deviated Programmed Learning Method was used, which must have been totally a new experience to the students, due to which the performance must have been low. In the other two units, where the average performance was observed the instructional inputs like lecture method and summary presentation were used. One thing to be noted in all those units which were evaluated by the criterion tests is, a low performance has not been observed at all. This indicates that the curriculum has been quite effective. Validation of the curriculum inferred from the achievement of students on comprehensive tests, also indicate quite a good performance of students. The descriptive and the inferential analysis carried out show that, the post performance of Experimental group on comprehensive tests was significantly higher than the control group. The 't' value (4.51) obtained on the post-comprehensive test shows that there is a significant difference between the Experimental and the Control group, with respect to mean performance. The 't' value(3.40) obtained on the pre and the post comprehensive test for Experimental group also indicates that there is a significant difference between the pre-test and the post-test performance. This is a clear evidence that the curriculum of Family Life Education has been effective.

Validation of the curriculum inferred from the attitude of students also indicate a high performance for the Experimental group on the post test over the pre test. The 't' value (4.40) obtained on the total attitude test shows that there is a significant difference between the pre and the post-attitude measures of Experimental group students. Similarly, the 't' value (4.39) obtained in respect of post-test measures of attitude for both Experimental and Control group

shows that there is a significant difference between both the groups, thereby pointing out to the effectiveness of the curriculum on the attitude of Experimental group students. Validation of the curriculum inferred from the analysis of students' reactions towards the curriculum and its various components, one can conclude that the curriculum was quite effective.

First of all, scrutinising into the content of the curriculum which forms a main components, it may be noticed that almost all units were received favourably by 90% of the students, except for the units like 'Family' and 'Family relations' towards which the students expressed quite an unfavourable reaction. It may be that the students were more interested in learning the biological and the psychological aspects of their selves rather than the units 'Family and Family Reactions', though they are very much related to their future adulthood roles. Another reason could be that, the units were taught through the lectures followed by the distribution of brief summaries, which were not much favoured by the students.

Secondly, looking into the instructional components which form another main component of the curriculum, it may be noticed from the reactions of the students towards various components, excepting the assignment method, summary form and the lecture method, for all other components, the reactions have been quite favourable- 70% and above have shown positive reactions. As a matter of fact, for components such as deviated PLM, dialogue form, audio-visual presentation, and exercises, about 90% of the students have expressed favourable reactions. In case of Assignment method, though 60% of the students have favoured generally, they seem to be under the notion that it is very time consuming, though it is interesting to learn new things on one's own. In case of summary, majority of the students seem to be disfavouring the method as it is too brief and devoid of details, illustrations, diagrams and so on with which the learning could have been interesting. Besides the individual perception of

various components used in the curriculum strategy, it should
be mentioned that students differ in their needs, interest,
attitude and study habits. That too, the present study because
of its new kind among the usual set up of school curricula, leads
to a kind of imperspicuousness in knowing about students' way of
receiving each new information presented in different styles.
However, the reactions of students show that the developed
strategy of the curriculum had been effective. The curriculum
can be made more effective by deciding to make modifications
wherever is needed, based on pupils' performance and reactions.
It could be made more effective by 'identifying the needs of
pupils' for the sake of planning his instruction.

Coming to the third component, that is, who should
teach the course, as 50% of the students had not responded, it
remains inconclusive in deciding about who should handle the
subject. As expressed by those who responded, the school science
Teachers usually avoid those units stressing on physiology of
sex, in Biology subject, because of their own hangups on sex-
i.e., their own emotional feelings. Moreover inadequacy in the
subject matter and poor communication leads to the failure of
the curriculum in reaching pupils. Besides this, it should be
mentioned that most of the students wanted counselling for their
personal problems, for which they preferred depending on the
School Counsellor. As expressed by them, it may be advantageous
to have a school counsellor to teach the Curriculum who is well
versed in the fields of physiology, psychology, sociology or
Anthropology and so on, as well as who is well trained to teach
the curriculum, so that he or she is able to communicate it
at a level that can be understood rather than poorly equipped
with the various fields mentioned and being emotionally blocked
from teaching a particular part of the curriculum.

As to the fourth component, whether Family Life
Education should remain as isolated course in the school curri-
culum or an integral part of the school curriculum it should be
noticed that almost 80% of the students have preferred it to be

it as a separate course rather than an integral course. The
reason being, it may not be well taught by the particular subject
teacher, hence the units incorporated in the particular subjects
will always receive a poor attention. This has always remained
a controversial issue, whether it should be a separate course or
an integral part of the curriculum. Though it is very much possi-
ble to discover the plug points and incorporate the units into
the legitimate existing disciplines, the total integration can-
not occur without properly trained teachers. As mentioned earlier,
from the students' reactions, it is quite obvious that the teachers
may avoid teaching those units or if at all they attempt to
teach, it would be just a work of imparting knowledge, but not
the way the objectives of Family Life Education would want to
steer the pupils to proper and healthy development of attitudes.
Family Life Education as a separate course in the school curri-
culum, may be , can gxxx gain a prominance with its proper teach-
ing materials, and a properly trained teacher who is well acquain-
ted with the areas of knowledge required as well as with an open
mind and positive attitude. It may also be mentioned that learn-
ing about oneself and the basic facts of life through a curriculum
of the present kind, demands a new set of behaviour on the part
of learners such as interest, attitude, curiosity level, study
habits, etc. In other words, a very different outlook free from
cultural inhibition, unnecessary taboos, superstitious beliefs
and so on, towards the very nature of curriculum is required.
These behaviours, as a matter of fact, get developed over a period
of time. And unless these behaviours are developed, the learners,
atleast a few of them are likely to show unfavourable reactions.

What is discussed in the earlier paragraphs regarding
the Validation of the curriculum in terms of students' achieve-
ments, attitude and reactions (Section 1,2 and 3) indicate three
main things one is, the curriculum of Family Life Education
has been quite effective. One could make out this, from the
results obtained on the achievement and the attitude of students,
where the hypotheses suggested were quite inconsistent with the

results obtained. Two is, there is every scope for the improve-
ment of the curriculum by a process of experimentation with
various instructional components based on pupils' needs and
characteristics, which may help not only in cognitive enrich-
ment, but also in attitudinal change and attitudinal improve-
ment. Improvement in the content of the curriculum is also
possible, by implementing it to the large samples of different
nature, and coming from different sub-groups of culture. Since
curriculum development is a continuous process, involving many
tryouts, appraisal of results, identification of inadequacies,
improving over the material, replanning, redevelopment and
their reappraisal, the implementation of the curriculum of
Family Life Education on large samples of various backgrounds,
needs and characteristics and testing the suggested hypotheses
in those situation might contribute to the improvement of the
curriculum, thereby enriching it. Three is, though certain
reactions were obtained regarding the position of Family Life
Education in the school curriculum, who should teach the
curriculum and so on, it is considered to be better, if the
reactions towards these issues are obtained at large, in order
to arrive at a   stand point.

In Section Four, the descriptive analysis of data
for Experimental and Control group on socio-economic status
show that none of the students from both the groups belong to
the low socio-economic status. Almost all of them were either
found belonging to the High socio-economic status or to the
middle socio-economic status. The descriptive analysis of
data for Experimental and Control group on Family Adjustment
shows that almost all the students belonging to both the groups
are well adjusted in their families. In Section Five, the
findings of the study regarding the relationship between the
variables, that is, the socio-economic status and the Family
Adjustment, though there are number of studies indicating a

positive relationship between both, the present study shows
that there is no significant relationship between both these
variables. However, this finding do not permit any definite
conclusion to be drawn at the moment. The relationship needs
to be explored further by using a large sample belonging to
different socio-economic status. Regarding the relationship
between the Family Adjustment and the Self-attitude, as observed
from the findings and the interpretation, a significant relation-
ship was found between both the variables in case of boys and
girls belonging to the Control group, whereas in the Experimental
group, the significant relationship was found only for boys.
Though the 'r' value of .50 which is obtained for girls belong-
ing to the Experimental group is not found significant, which
may be due to the small sample, it is considered to show a
positive relationship. This finding is in line with those
studies done on the nature of the family and relationship among
the family members which show that a democratic home environment
with closer parent-child relationship provides healthy condition
for social and psychological growth and development through
the guidance in social participation, and enhances the develop-
ing ego and growth towards independence of the adolescents.
(Landis and Stone, 1952; Liccoine,1955; Mussenetal,1963;
Sherwood, 1962; Raschke,1979; Jogawar, 1976; Reddy,1966; Majumdar,
1972). Regarding the relationship between the achievement and
the attitude, it is quite evident from the findings obtained,
that there is a significant relationship between the achievement
and the attitude of students. This finding is in congruence
with the logical rationale put forward by Krathmohl, Bloom and
Masia (1964), that there is a relationship between the cognitive
and the affective behaviours. It supports the assumption that
any alteration at the existing cognitive structure of students,

influences the attitudes of students towards those particular
concepts, either in a positive or in a negative way. The
knowledge provided on the topics like the biological, psycho-
logical and the social self, perception of the other, Human
sexuality, the biological, psychological and the sociological
aspects of the family,did have an impact on the students' atti-
tude towards these topics and influenced them positively, there-
by showing a relationship between the achievement and the atti-
tude of students.

The study of the effectiveness of the curriculum and
the understanding of certain relationships which were aimed at
by (2), (3), (4), (5) objectives of the investigation constitu-
ted the content of this chapter. Details regarding the sixth
objective of the study, namely, the study of cost and time in-
volved in developing and implementing the curriculum of Family
Life Education is presented in the next chapter.