Chapter IV

Analysis and Interpretation

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CHAPTER IV

ANALYSIS AND INTERPRETATION

4.1 Introduction

Statistics is a body of mathematical technique or processes for gathering, organizing, analyzing and interpreting numerical data. Since research yields quantitative data, statistics is the basic tool of measurement, evaluation and research. Statistical data describes group behaviour or group characteristics abstracted from a number of individual observations which are combined to make generalizations possible. Statistical method goes to the fundamental purposes of description and analysis. Statistics enables the researcher to analyze and interpret the data for drawing conclusions.

Interpretation of the data refers to that important part of the research which is associated with the drawing of inferences from the collected facts. Statistical facts by themselves have no utility. It is the interpretation that makes it possible to utilize the collected data in various fields of study.

4.2 Techniques Used in Data Analysis:

This study undertook to study the effect of CAI intervention provided in the Head Start programme. Gender and locale were also analyzed in the study in relation to their effect. Thus the independent variables;

1. Intervention (Head Start and Non-Head Start),
2. Locale (Urban and Rural),
3. Gender (Male and Female),

The effect studied was in relation to the two facets of the study. One facet is the analysis of students' achievement in English Language and other is the analysis

of students' opinion towards the Head Start inputs provided to them to enhance learning. Thus the two dependant variables;

1. Achievement in English Language, and
2. Opinion towards Head Start inputs,

The results are presented under these two major categories. The scores obtained were grouped intervention-wise, locale-wise and according to gender of the students. The Mean-scores and Standard-deviations for each group categorized were computed and the Mean-scores were compared using a t-test statistic.

4.3 Achievement analysis

4.3.1 Intervention-wise

Hypothesis 1

This hypothesis aimed at analyzing whether there is any difference in achievement between the students of the two categories as a result of the interventions.

Ho1.There is no significant difference in the achievement in English Language between Head Start school students and Non-Head Start school students.

Table 4.1 t-Value for the Mean-scores in English Language achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	81.30	11.25	1.50	8.42*	105	.000
Non-Head Start	51	57.29	17.82	2.50			

* P < .01,   df 105

Table 4.1 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in English Language is significant at .01 level.

The studies conducted by Prabhakar and Sansanwal (1989); Jeyamani (1991); Singh, Ahluwalia and Verma (1991); Dubey and Adhikari (1999);and Gautam (1999), on the achievement of students at secondary level comparing Computer Assisted Instruction (CAI) and Traditional Method also revealed the significant effect of the intervention. Though none of the studies studied the achievement of elementary level students but still this study can draw support from the above mentioned studies for the result with reference to Hypothesis1, confirming the achievement differences between CAI and Traditional Method.

The hypothesis that, *"There is no significant difference in the achievement in English Language between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1 % chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome, which became evident from the review of the related studies. Although there has not been any study conducted to assess the achievement of students under Head Start programme, yet the intervention given in the programme is prominently CAI and a number of studies studying the same intervention are available to provide the support to these results.

HYPOTHESIS 2

This hypothesis aimed at analyzing whether there is any difference in achievement in the "Alphabetical Knowledge" component between the students of the two categories as a result of the interventions.

Ho2. There is no significant difference in the achievement in "Alphabetical Knowledge" component between Head Start school students and Non-Head Start school students.

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Table 4.2 t-Value for the Mean-scores in the "Alphabetical Knowledge" component achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	17.70	2.09	.28	6.81*	105	.000
Non-Head Start	51	14.31	3.00	.42			

* P < .01,   df 105

Table 4.2 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in "Alphabetical Knowledge" component of English Language is significant at .01 level.

The hypothesis that, *"There is no significant difference in the achievement in "Alphabetical Knowledge" component between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1% chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome.

As, a number of studies could be found revealing significantly high achievement of the students who were taught through CAI in terms of there overall achievement in a subject, here studying the effect of the CAI on the achievements in a particular component of the subject can again lean on the results of the same studies mentioned in the interpretation for Hypothesis1.

HYPOTHESIS 3

This hypothesis aimed at analyzing whether there is any difference in achievement in the "Knowing Animals" component between the students of the two categories as a result of the interventions.

Ho3. There is no significant difference in the achievement in "Knowing Animals" component between Head Start school students and Non-Head Start school students.

Table 4.3 t-Value for the Mean-scores in the "Animals' Babies and Dwellings " component achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	15.18	2.76	.37	6.47*	105	.000
Non-Head Start	51	11.55	3.04	.43			

* P < .01,   df 105

Table 4.3 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in "Animals' Babies and Dwellings" component of English Language is significant at .01 level. This analysis clearly shows that students studying through CAI learn better about the animals, their dwellings and babies, in English as compared to students who are taught about these things through traditional method.

The hypothesis that, *"There is no significant difference in the achievement in "Animals' Babies and Dwellings" component between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1% chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome. As, already a number of studies have been mentioned in support of the results of Hypothesis1, revealing significantly high achievement of the students who were taught through CAI in terms of there overall achievement in a subject, here, the results of the effect of

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CAI on the achievements in a particular component of the subject can again lean on their results.

HYPOTHESIS 4

This hypothesis aimed at analyzing whether there is any difference in achievement in the "Identifying Colours" component between the students of the two categories as a result of the interventions.

Ho4. There is no significant difference in the achievement in "Identifying Colours" component between Head Start school students and Non-Head Start school students.

Table 4.4 t-Value for the Mean-scores in the "Identifying Colours" component achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	12.29	1.49	.20	6.66*	105	.000
Non-Head Start	51	8.80	3.59	.50			

* P < .01,   df 105

Table 4.4 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in "Identifying Colours" component of English Language is significant at .01 level. The t-value in this analysis gives a clear indication that the Head Start school students, who have been taught with the help of MMRL applying CAI method have gained a better knowledge of colour names in English as compared to the students of Non-Head Start schools.

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The hypothesis that, *"There is no significant difference in the achievement in "Identifying Colours" component between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1% chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome. As, a number of studies could be found revealing significantly high achievement of the students who were taught through CAI in terms of there overall achievement in a subject, here studying the effect of the CAI on the achievements in particular component "Identifying Colours" of English Language subject can again lean on the results of the same studies mentioned in the interpretation for Hypothesis1.

HYPOTHESIS 5

This hypothesis aimed at analyzing whether there is any difference in achievement in the "Knowing Body Parts" component between the students of the two categories as a result of the interventions.

Ho5. There is no significant difference in the achievement in "Knowing Body Parts" component between Head Start school students and Non-Head Start school students.

Table 4.5 t-Value for the Mean-scores in the "Knowing Body Parts" component achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	13.34	1.70	.23	7.38*	105	.000
Non-Head Start	51	9.31	3.67	.51			

* P < .01,   df 105

Table 4.5 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in "Knowing Body Parts" component of English Language is significant at .01 level.

The t-value in this analysis gives a clear indication that the Head Start school students, who have been taught with the help of MMRL applying CAI method, have learned the names of the body parts in English, better, as compared to the students of Non-Head Start schools.

The hypothesis that, *"There is no significant difference in the achievement in "Knowing Body Parts" component between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1% chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome. As, already a number of studies have been mentioned in support of the results of Hypothesis1, revealing significantly high achievement of the students who were taught through CAI in terms of there overall achievement in a subject, here, the results of the effect of CAI on the achievements in this particular component of the subject can again lean on their results for support.

HYPOTHESIS 6

This hypothesis aimed at analyzing whether there is any difference in achievement in the "Sentence Formation" component between the students of the two categories as a result of the interventions.

Ho6. There is no significant difference in the achievement in "Sentence Formation" component between Head Start school students and Non-Head Start school students.

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Table 4.6 t-Value for the Mean-scores in the "Sentence Formation" component achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	13.91	5.56	.74			
Non-Head Start	51	5.90	5.15	.72	7.71*	105	.000

* P < .01,   df 105

Table 4.6 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in "Sentence Formation" component of English Language is significant at .01 level. The t-value in this analysis gives a clear indication that the Head Start school students, who have been taught with the help of MMRL applying CAI method, are able to form sentences in English, more correctly, as compared to the students of Non-Head Start schools.

The hypothesis that, *"There is no significant difference in the achievement in "Sentence Formation" component between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1% chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome. This can also gain grounds from the results of other studies, which have already been mentioned in the analysis interpretation of Hypothesis1.

HYPOTHESIS 7

This hypothesis aimed at analyzing whether there is any difference in achievement in the "Phonetics" component between the students of the two categories as a result of the interventions.

Ho7. There is no significant difference in the achievement in "Phonetics" component between Head Start school students and Non-Head Start school students.

Table 4.7 t-Value for the Mean-scores in the "Phonetics" component achievement of Head Start school students and Non-Head Start school students.

category	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Head Start	56	8.89	1.14	.15	5.66*	105	.000
Non-Head Start	51	7.14	1.99	.28			

* P < .01,   df 105

Table 4.6 gives for the mean differences of students' studying in Head Start schools and Non-Head Start schools. The difference in achievement in "Phonetics" component of English Language is significant at .01 level.

The t-value in this analysis gives a clear indication that the Head Start school students, who have been taught with the help of MMRL applying CAI method, have better understanding of phonetics and pronunciations in English, as compared to the students of Non-Head Start schools.

The hypothesis that, *"There is no significant difference in the achievement in "Phonetics" component between Head Start school students and Non-Head Start school students"* is rejected at .01 level and there is only 1% chance of there being no difference in the achievements. There are 99% chances for the repetition of the same outcome. This can also gain grounds from the results of other studies, which have already been mentioned in the analysis interpretation of Hypothesis1.

Analysis of these hypotheses (hypothesis1 to hypothesis7), reveal a significantly high achievement of the students of Head Start schools, in the overall achievement in English Language and in all the particular components identified as hard spots which are taught to them through CAI, as compared to the achievements of the students of Non-Head Start schools. Though there was no study found to be conducted to measure the achievement of students of Head Start schools, yet a number of them were found where the effectiveness of CAI, which is the major intervention of the Head Start Programme, have been studied and the present study can easily avail their support to confidently generalize the findings that Computer Assisted Instruction method helps the students in learning better and acquiring more understanding and knowledge. the reviewed studies narrate the effectiveness for the students of secondary level but the present study further adds one major finding that the CAI is effective for the elementary level students also in helping them to learn better.

The researcher further tried to analyze, in which particular component did CAI made the most effect on the students' performance, studying in Head Start schools. For this purpose, an analysis of the t-values in all the components, comparing the achievement of Head Start school students and Non-Head Start school students, was done.

Table 4.8 shows the Mean-scores of achievements in all the six components. As detailed in the table, the t-values that are the values for difference in achievement between the Head Start school students and Non-Head Start school students in the six components (the hard spots) are significantly high but comparing all these values reveals that the t-value in the "Sentence Formation" component is the highest and thus this can be comfortably interpreted that the students of Head Start schools studying through CAI have benefited the most in acquiring the knowledge of sentence formation in English. The t-value 7.71 show that, in this particular component there has been the highest difference in the achievement between the Head Start schools students and Non- Head Start schools students. The least difference in achievement between the students of

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the two categories has been in the "phonetics" component , for which the t-value is 5.66.

Table 4.8 t-Values for the Mean-scores of achievement in all the six components between Head Start schools students and Non-Head Start school students.

component	t
Alphabetical Knowledge	6.82
Knowing Animals	6.47
Identifying Colours	6.66
Knowing Body Parts	7.38
Sentence Formation	7.71
Phonetics	5.66

4.3.2 Locale-wise

Hypothesis 8

This hypothesis attempts to probe into the role of locale in the effectiveness of intervention in the form of Computer Assisted Instruction method in the Head Start program.

Ho8. There is no significant difference in the achievement in English Language between urban Head Start school students and rural Head Start school students.

Table 4.9 t-Value for the Mean-scores in English Language achievement of urban Head Start school students and rural Head Start school students.

Locale	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Urban	30	83.63	10.39	1.90	1.69NS	54	.096
Rural	26	78.62	11.79	2.31			

NS   Not Significant

Table 4.9 gives the t-value for the mean differences of students' studying in urban Head Start schools and rural Head Start schools. The difference in achievement in English Language is not significant.

The t-value computed in this analysis reveal that locale is not playing any role in the students' achievement when they are taught through MMRL applying the CAI method. Computer Assisted Instruction proves to be effective for both the urban and rural students with the same intensity.

Thus the Hypothesis that, *"There is no significant difference in the achievement in English Language between urban Head Start school students and rural Head Start school students"* is accepted.

The study conducted by Stella V. (1992) also revealed that the variable locale did not affect the level of achievement of the students after CAI intervention in both rural and urban group of students. The present study further strengthens the finding that both rural and urban students benefit the same way from CAI method.

4.3.3 Gender-wise

Hypothesis 9

This hypothesis aspired to study the differences in achievement in English Language between the boys and girls of Head Start schools.

Ho9. There is no significant difference in the achievement in English Language between boys of Head Start schools and girls of Head Start schools.

Table 4.10 t-value for the Mean-scores in English Language achievement of boys of Head Start Schools and girls of Head Start schools.

Gender	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Boys	30	80.78	11.50	1.92	0.46NS	54	0.643
Girls	26	82.25	11.02	2.46			

NS   Not Significant

Table 4.10 gives the t-value for the mean differences of male students and female students studying in Head Start schools. The difference in achievement in English Language is not significant.

The t-value computed in this analysis reveal that gender is not playing any role in the students' achievement when they are taught through MMRL applying the CAI method. Computer Assisted Instruction proves to be effective for both the boys and girls with the same intensity.

Thus the Hypothesis that, *"There is no significant difference in the achievement in English Language between boys of Head Start schools and girls of Head Start schools"* is accepted.

The studies undertaken by Prabhakar and Sansanwal (1989); Jeyamani (1991); Singh, Ahluwalia and Verma (1991); and Stella V. (1992) lend support to the results of the present study regarding gender being inactive in terms of

effectiveness of CAI. The intervention of CAI has been proven equally effective for both boys and girls.

4.4 Analysis of the Opinionnaire to Study Students' Opinion towards Head Start Interventions

4.4.1 Students' Opinion

The researcher attempted to analyze the opinion of the students towards inputs given under Head Start programme. The opinion gathered was particularly towards the use of computers in teaching-learning process and to what extent they like this input and get the opportunity to learn through it. The table 4.11 gives the statement-wise opinion response of the students, in terms of percentage of students agreeing or disagreeing to the particular statement or not sure of their opinion towards the particular statement. From this table it could be inferred that more than 50% of them agreed to the following positive statements

- Find the use of computer interesting
- Do not like teacher's interference while learning through computer
- Learn fast through computer
- Feel comfortable while learning through computer
- Do not feel afraid of working on computer
- Like to learn through CDs on computer
- Get proper opportunity to use computer
- Do not feel the need of a teacher while learning through computer
- Learn at own pace through computer
- Avoid absenteeism, as wants to work on computer

and more than 50% of them disagreed with the following negative statements

- Feel lonely while working on computer
- Try to avoid leaning through computer
- Experience boredom while learning through computer
- Find it difficult to learn through computer
- Feel that teacher teaches better than computer.

Table 4.11 Responses of the students on Opinionnaire towards Head Start

Interventions in teaching learning process.

Statement	Percentage (%) of the students		
	Agree	Not Sure	Disagree
Find the use of computer interesting	95	4	1
Feel lonely while working on computer	25	4	71
Try to avoid leaning through computer	2	7	91
Do not like teacher's interference while learning through computer	68	16	16
Learn fast through computer	82	11	7
Experience boredom while learning through computer	11	11	78
Feel comfortable while learning through computer	75	16	9
Do not feel afraid of working on computer	71	13	16
Find it difficult to learn through computer	18	7	75
Feel that teacher teaches better than computer	30	13	57
Like to learn through CDs on computer	88	7	5
Get proper opportunity to use computer	89	0	11
Do not feel the need of a teacher while learning through computer	32	13	55
Learn at own pace through computer	64	14	22
Avoid absenteeism, as wants to work on computer	81	14	5

The graphical representations of responses on each statement are shown in Figures 4.1- 4.15 (pp 61-68).

4.4.2 Score-wise analysis

The opinionnaire was a 3 point rating scale, where the students either agreed or disagreed or were not sure of the opinion on each item. The opinionnaire comprised of ten positive statements and five negative statements about the interventions of the "Head Start" programme.

For confirming whether the opinion of the students is favourable towards the interventions of the Head Start programme or not, the scoring of the opinions was done as shown in the table 3.3 on page 40.

According to the scoring the maximum score could be 45 showing favourable opinion to the highest degree and minimum score could be 15 showing unfavourable opinion to the highest degree. The neutral score was calculated to be 30. Thus using these values the students were grouped in Favourable, Neutral and Unfavourable categories, opinion-wise. The students having a score between 31 and 45 were grouped in Favourable opinion category and the students having a score between 29 and 15 were grouped in Unfavourable opinion category. The students who scored 30 in the opinionnaire were grouped in neutral opinion category, not showing inclination of their opinion to either be favourable or unfavourable towards the interventions of the Head Start programme. Table 4.12 shows this distribution with the number of students in each category.

Table 4.12 Frequencies of the students in opinion categories

Opinion Category	Favourable	Neutral	Unfavourable
Frequency	56	0	0

As shown in the table, it became evident that all of the 56 students had a favourable opinion towards the interventions being given in the head Start programme.

Though some of the students did not agree to some of the positive statements and again some of them did not disagree with the a few of the negative statements but when analyzing in terms of over all opinion it was revealed that all the students have a favourable opinion.

On the basis of the data of responses made by the students showing their opinion towards Head Start interventions, researcher attempted to analyze the role of the gender and locale on opinion of the students with the help of the following hypotheses.

Hypothesis 10

This hypothesis aimed at analyzing whether there is any difference in the opinion towards Head Start interventions between urban Head Start school students and rural Head Start school students.

Ho10. There is no significant difference in the opinion towards Head Start interventions between urban Head Start school students and rural Head Start school students.

Table 4.13 t-Value for the Mean-scores in opinion towards Head Start interventions of students studying in urban Head Start schools and rural Head Start schools

Locale	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Urban	30	39.30	10.39	.66	.80 NS	54	.425
Rural	26	38.42	11.79	.89			

NS Not Significant

Table 4.13 gives the t-value for the mean differences of students' opinion towards Head Start interventions, studying in urban Head Start schools and rural Head Start schools. The difference in opinion is not significant.

The t-value computed in this analysis reveal that locale is not playing any role in the students' opinion towards Head Start interventions. Computer Assisted Instruction proves to have the favourable opinion of students from both the locales to the same extent.

Thus the hypothesis that, *"There is no significant difference in the opinion towards Head Start interventions between urban Head Start school students and rural Head Start school students"* is accepted.

Hypothesis 11

This hypothesis aimed at analyzing whether there is any difference in the opinion towards Head Start interventions between boys of Head Start schools and girls of Head Start schools.

Ho10. There is no significant difference in the opinion towards Head Start interventions between boys of Head Start schools and girls of Head Start schools.

Table 4.14 t-value for the Mean-scores in opinion towards Head Start interventions of boys of Head Start Schools and girls of Head Start schools.

Gender	N	mean	SD	Std error of mean	t	df	Sig 2-tailed
Boys	30	38.75	4.49	.75	-.35 NS	54	.727
Girls	26	39.15	3.23	.72			

NS Not Significant

Table 4.14 gives the t-value for the mean differences of students' opinion towards Head Start interventions, studying in urban Head Start schools and rural Head Start schools. The difference in opinion is not significant.

The t-value computed in this analysis reveal that gender is not playing any role in the students' opinion towards Head Start interventions. Computer Assisted Instruction proves to have the favourable opinion of students from both the categories to the same extent.

Thus the hypothesis that, *"There is no significant difference in the opinion towards Head Start interventions between boys of Head Start schools and girls of Head Start schools"* is accepted.

Figure 4.1 Bar-Graph showing % of students opining on finding the use of computers interesting.

Find the use of computer interesting
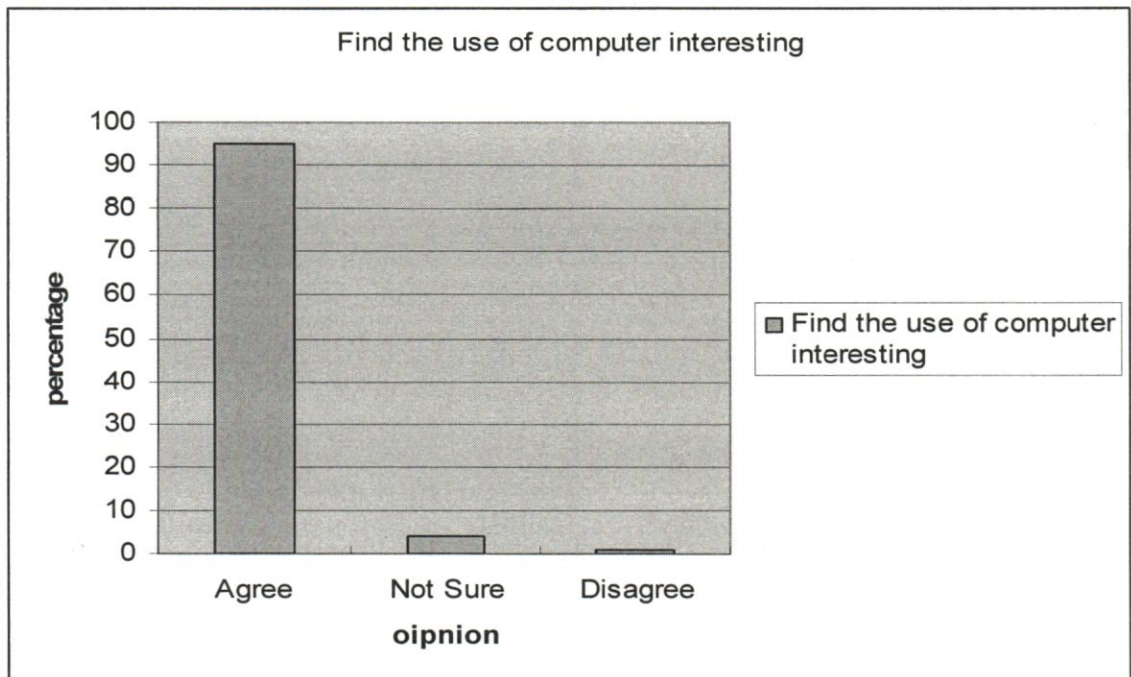
Figure 4.2 Bar-Graph showing % of students opining on feeling lonely while working on computer.

Feel lonely while working on computer
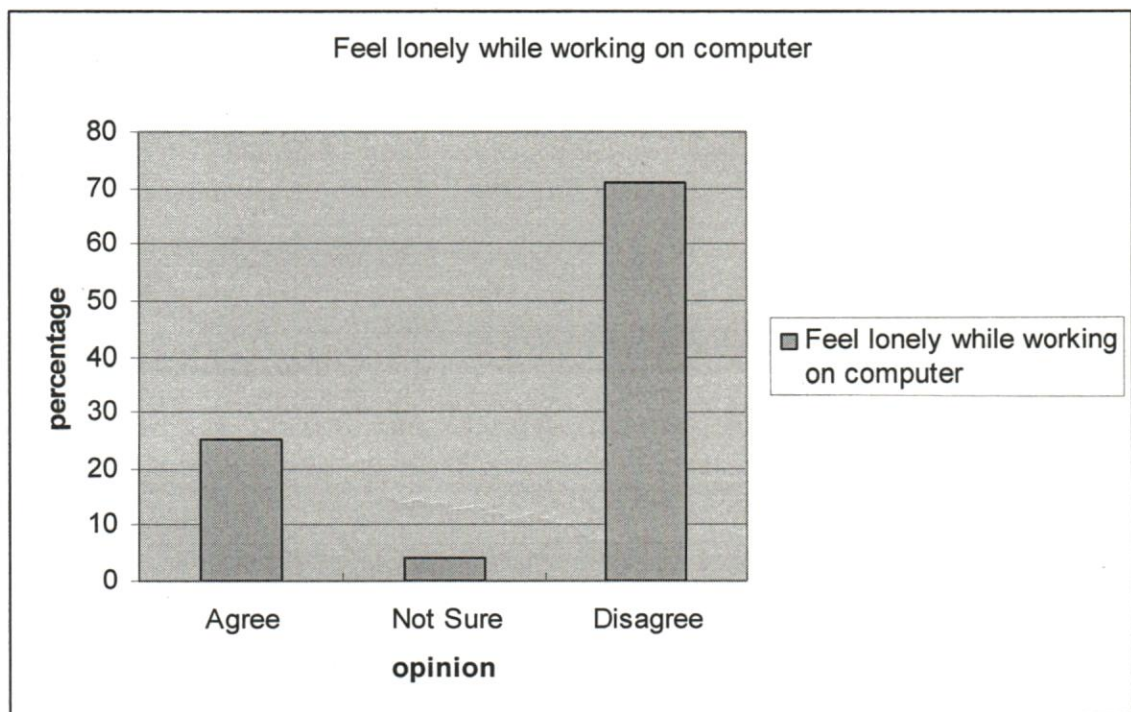
Figure 4.3 Bar-Graph showing % of students opining on trying to avoid learning through computer.

Try to avoid leaning through computer
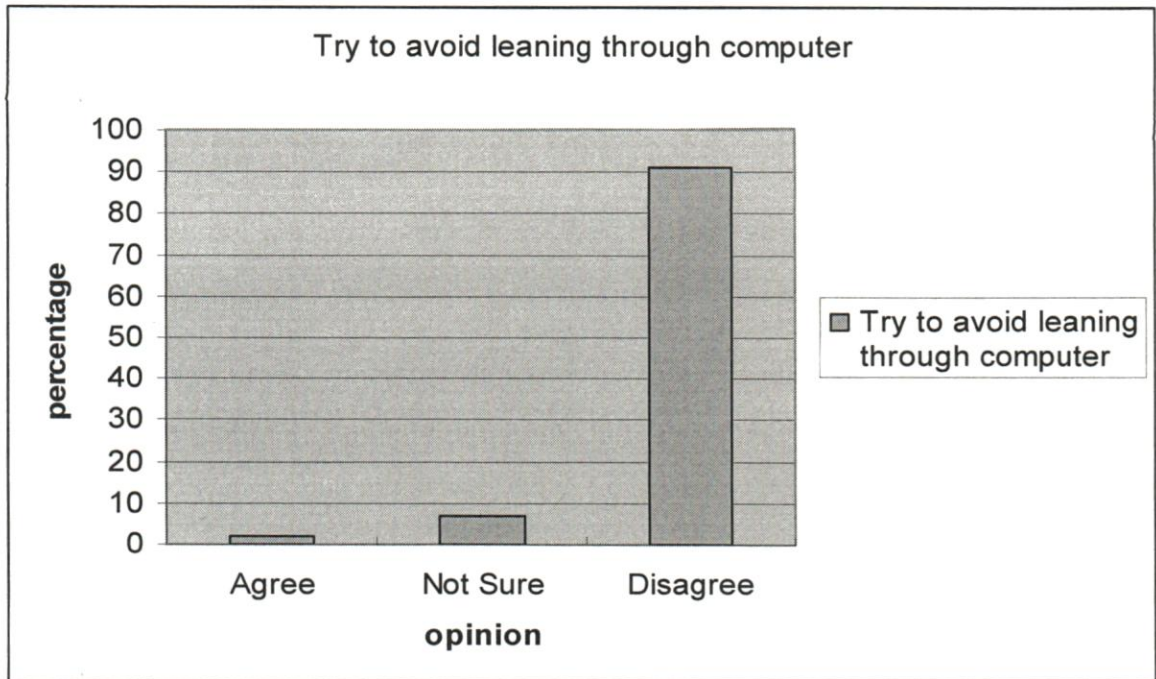
Figure 4.4 Bar-Graph showing % of students opining on not liking interference of teacher, while learning through computer.

Do not like to be disturbed by the teacher while learning through computer
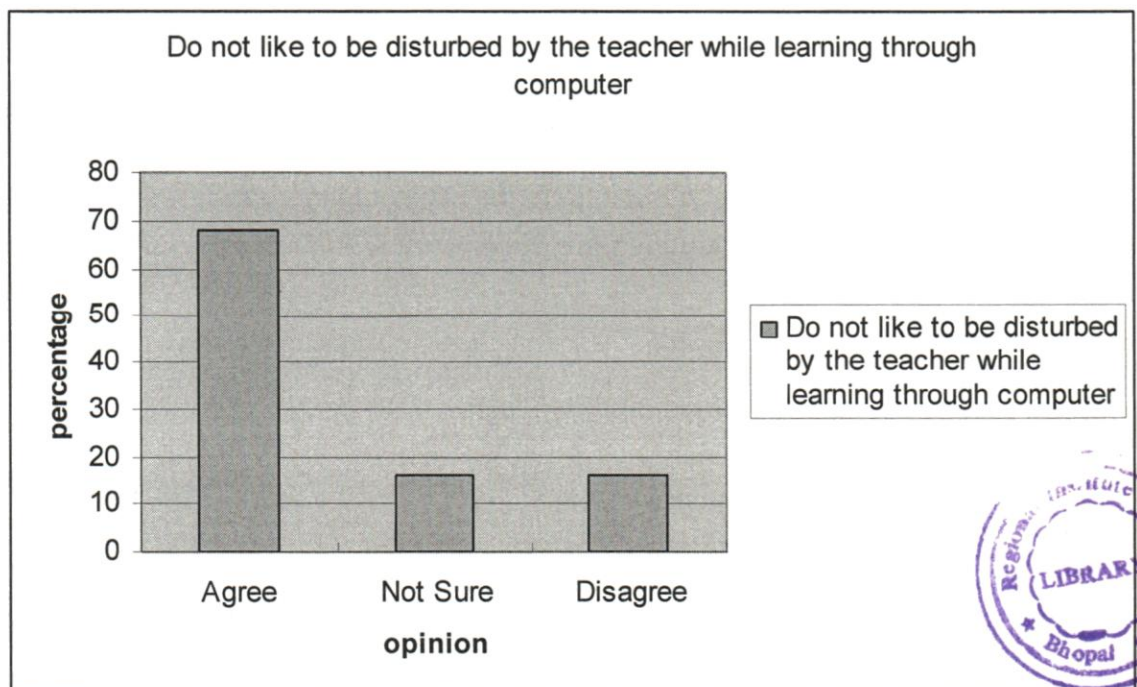
Figure 4.5 Bar-Graph showing % of students opining on fast learning speed while learning through computer.
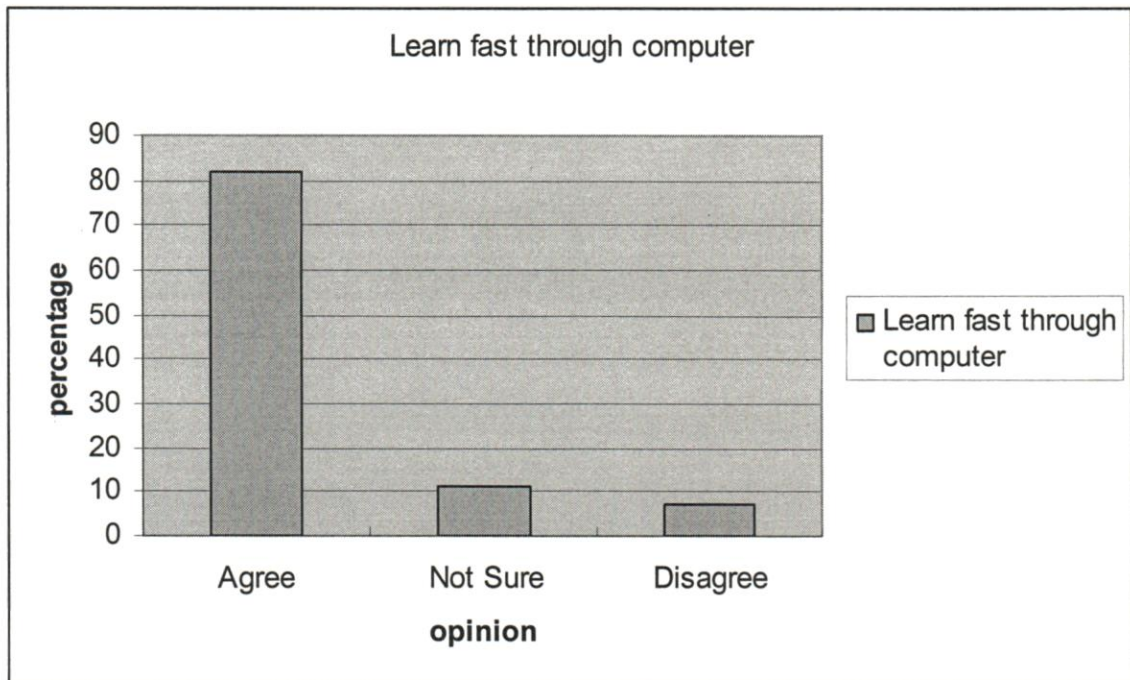
Figure 4.6 Bar-Graph showing % of students opining on experiencing boredom while learning through computer.
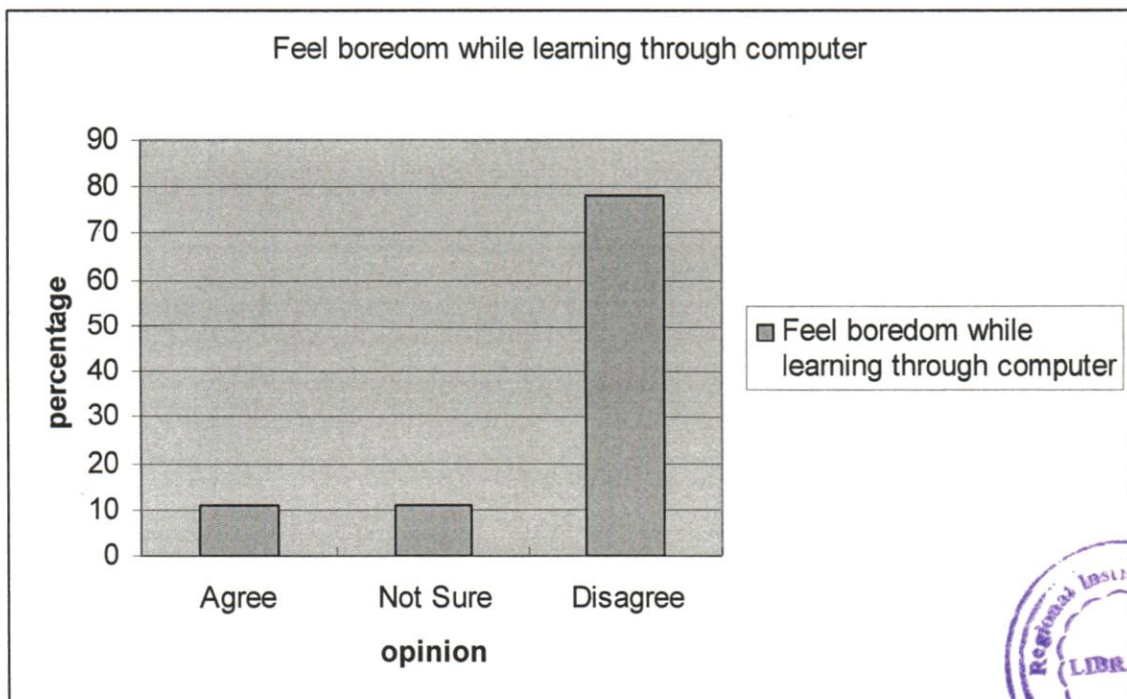
Figure 4.7 Bar-Graph showing % of students opining on feeling comfortable with the use of computer in learning.
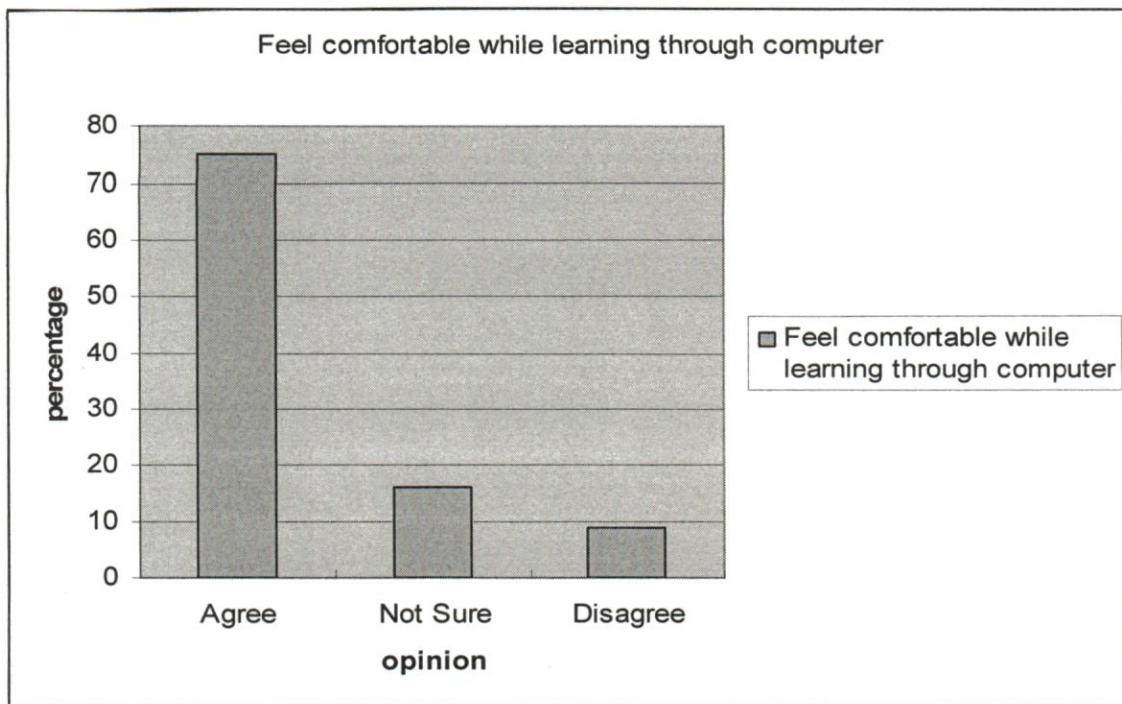
Figure 4.8 Bar-Graph showing % of students opining on not feeling afraid of using computer in learning.
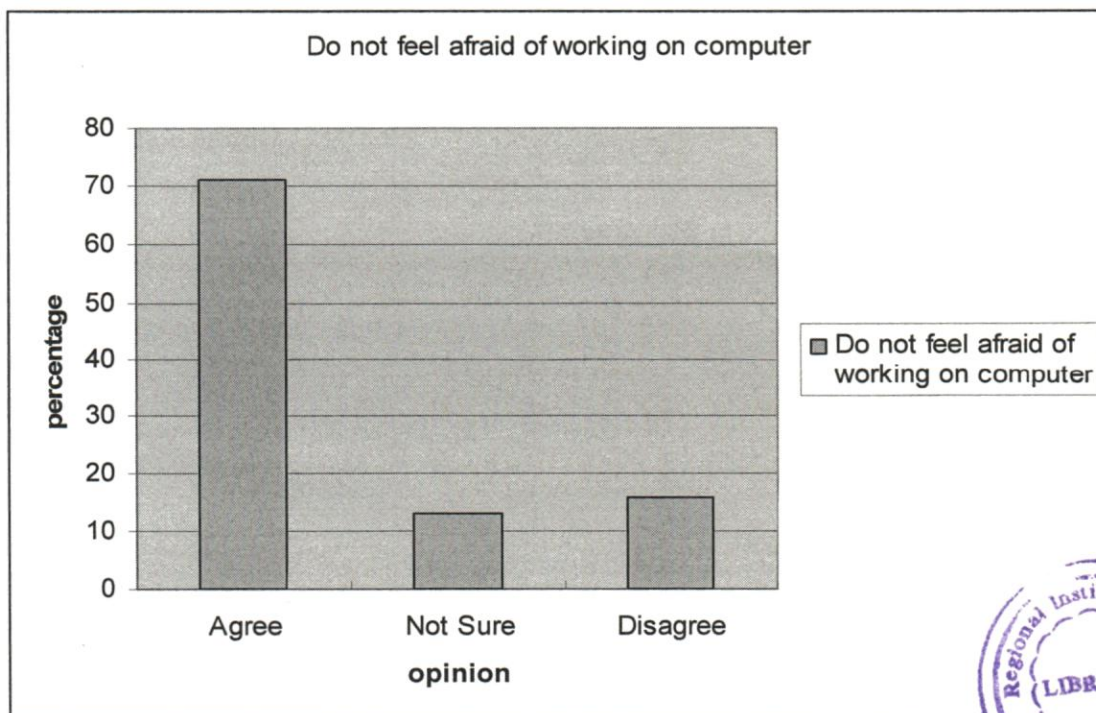
Figure 4.9 Bar-Graph showing % of students opining on finding computer usage difficult in learning.

Find it difficult to learn through computer

□ Find it difficult to learn through computer

percentage

opinion
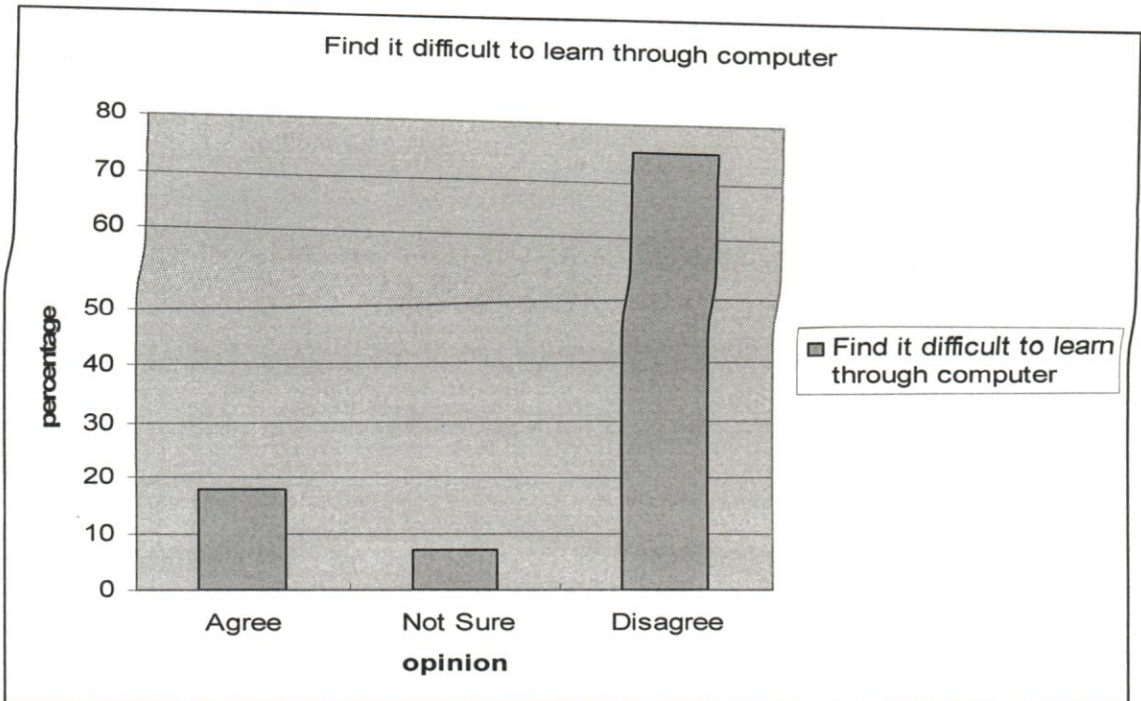
Figure 4.10 Bar-Graph showing % of students opining on teacher teaching better than computer.

Teacher teaches better than computer

□ Teacher teaches better than computer

percentage

opinion
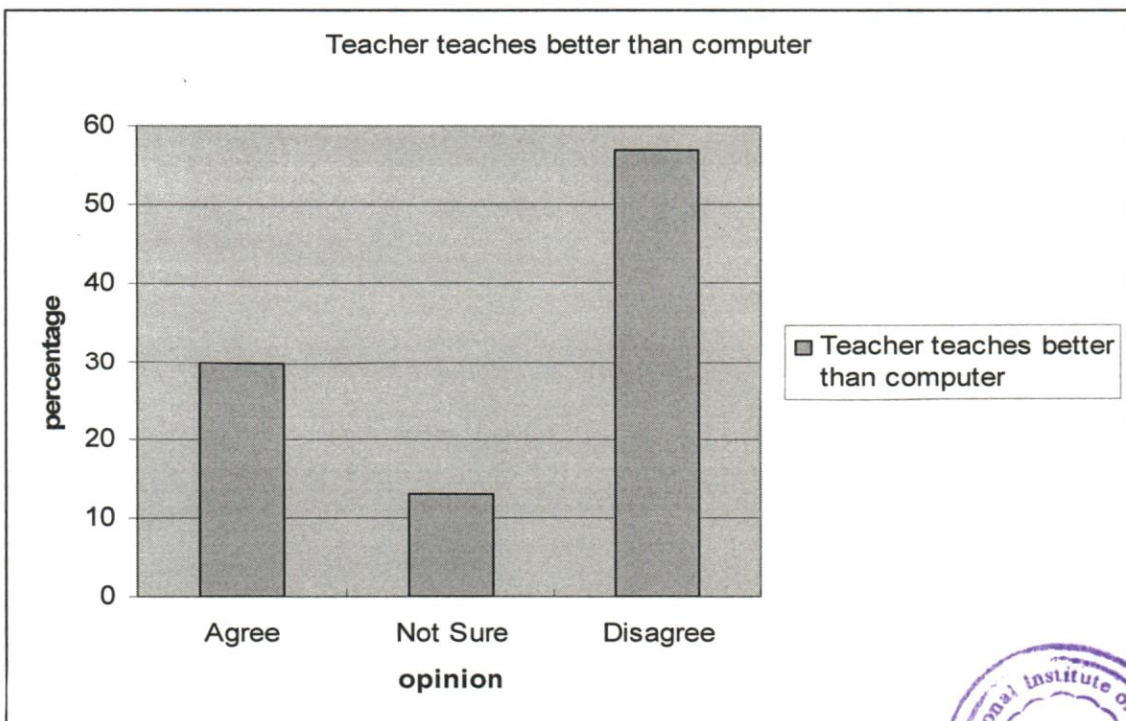
Figure 4.11 Bar-Graph showing % of students opining on liking to learn by using CDs.
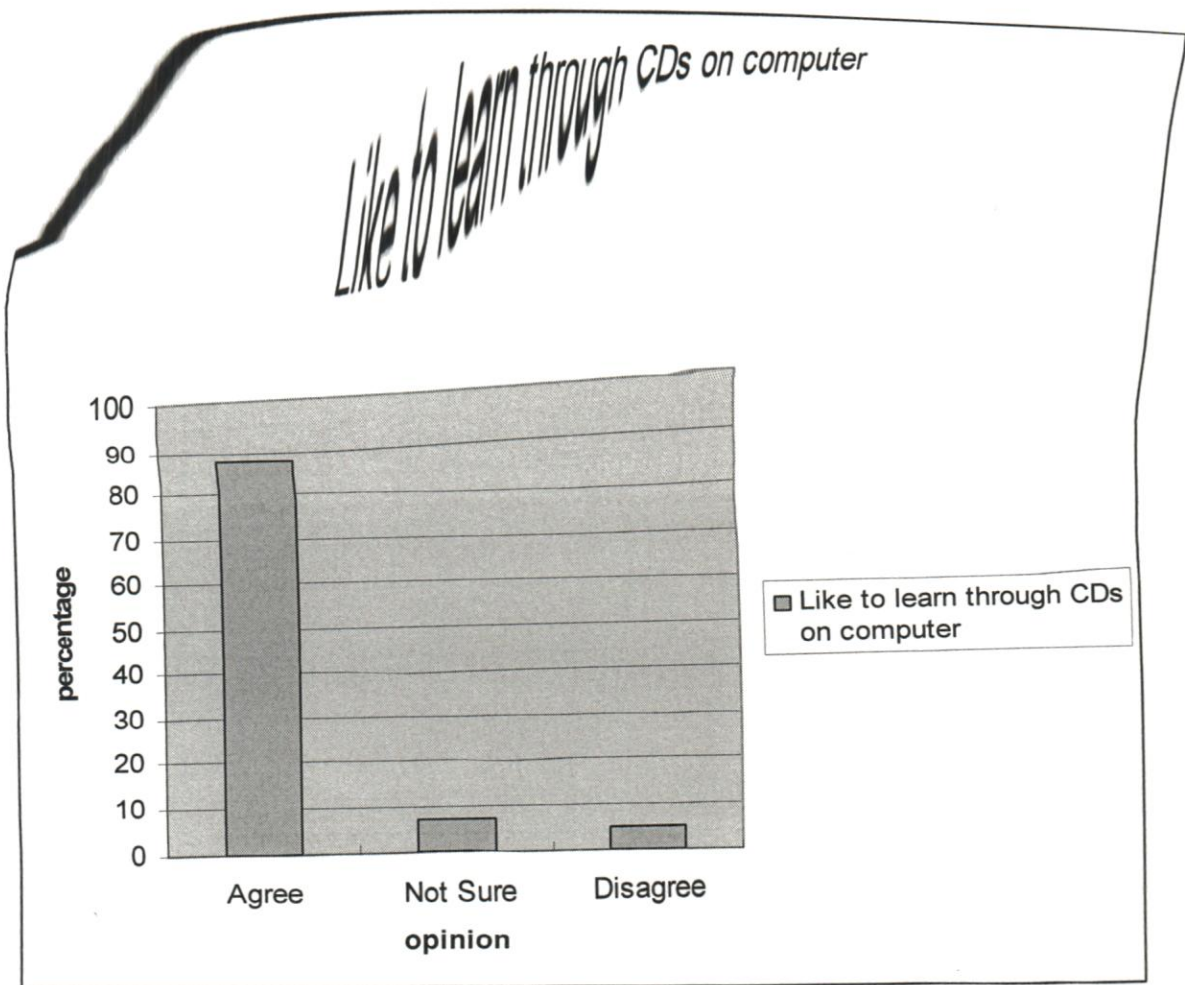
Figure 4.12 Bar-Graph showing % of students opining on getting opportunity to use computer.
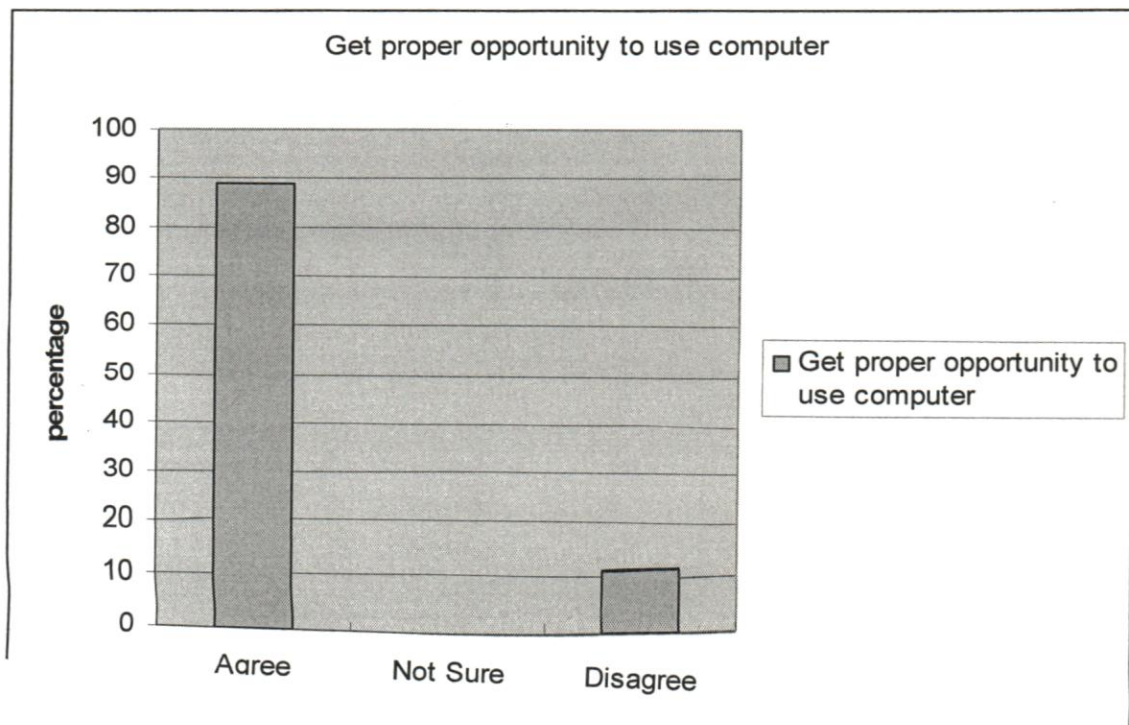
Figure 4.13 Bar-Graph showing % of students opining on feeling the need of teacher, when learning through computer.
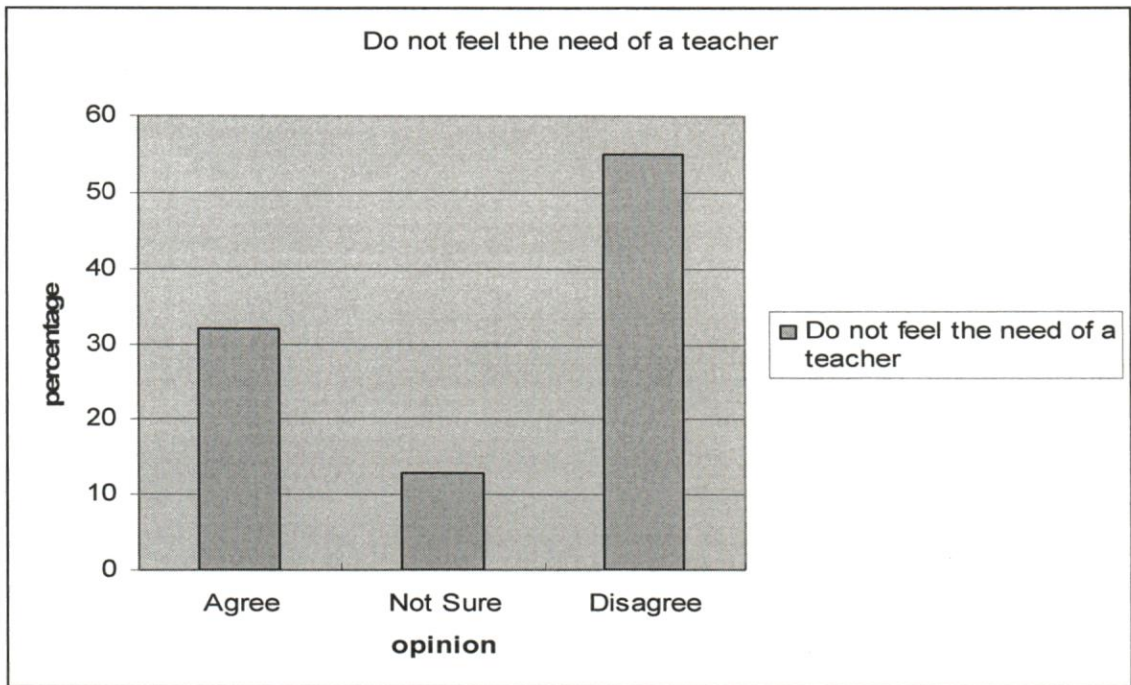

Figure 4.14 Bar-Graph showing % of students opining on learning at own pace through computer.
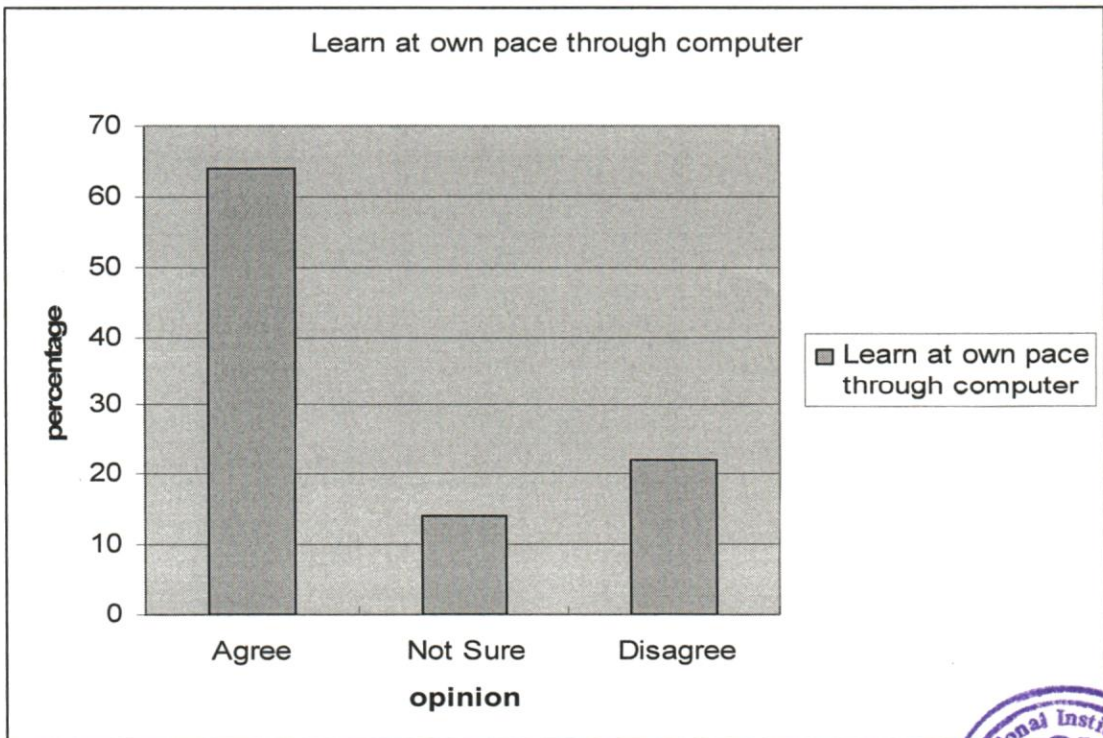
Figure 4.15 Bar-Graph showing % of students opining on regularity in attending school under Head Start programme.

Avoid absenteeism, as wants to work on computer