

USE OF COMPUTER AIDED TEACHING IN G.C.E. (A/L) PHYSICS IN SAMMANTHURAI AND KALMUNAI EDUCATION ZONES

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The information communication technology (ICT) plays an important role in Physics teaching and learning process. Thus, the effect of ICT in Physics teaching at G.C.E. (A/L) has been investigated. For this study, the refraction of light in Wave and Oscillation (a sub section of Unit 03 in Grade 12) was used. The sample consisted of 169 students from four mixed classes in two 1AB schools at Samanthurai and Kalmunai. One class in each school was randomly selected and taught by ICT method whereas the other two classes were taught in Chalk & Talk method. A Post-Test question paper was administered to all students and the students' marks were analyzed by the statistical method using two samples T-test and CI in Mini Tab software. Our finding shows that the competency levels of students followed ICT method were larger than that of Chalk & Talk method. Furthermore, it hardly found any effect of competency levels by gender and by the schools in rural and urban areas.

Keywords:

Physics Teaching, Information Communication Technology, Wave and Oscillation, Refraction of Light.

Extended Abstract

RESEARCH METHODOLOGY

In order to enhance the learning of Optics by A/L students, a comparative analysis of the teaching methodology adopted by the teachers of A/L physics classes in classroom using Chalk & Talk method and using computer lab through ICT method were done, and also, to assess the hypothesis to find positive or negative relationship between them. The study is based on quantitative design for the comparative study.

After reviewing the available baseline information, KM/Al-AsrackMahaVidyalaya, Kalmunai and ST/Sammanthurai Muslim MahdyaMahaVidyalaya, Sammanthurai (National School) were selected as the two schools for this study.

First primary data was collected by pre-test and interviews. Then, to assess the students' standard knowledge in optics secondary source of information was collected from A/L report books, past performance of students at GCE A/L and the opinions of Principals and A/L physic teachers as well as students' concerns with regard to Physics.

After seeking permission from Sammanthurai and Kalmunai Educational zones, the past exam results of A/L science classes for 2 years were obtained. Then the time table for A/L physics was obtained through school principals, sectional heads and Physic subject teachers.

Sample Selection.

The sample utilized for this study comprised of 169 students who were randomly selected from first year of G.C.E. (A/L) science classes from the selected two schools. The four groups consist of 169 students of whom 98 are males and 71 are females. From the urban school there were 84 students of whom 49 are male and 35 are female. In other words, there were 22 male and 20 girls for Chalk & Talk method class and 27 male and 16 female for ICT method class in rural area. There were 26 male and 18 female for Chalk & Talk method class and there were 23 male and 17 female for ICT method class in urban area. This information is clearly revealed in Table 3.1 and 3.2.

Table- 3.1: Number of students taken from selected schools for Chalk &Talkmethod of Teaching.

Name of Schools	Type of Schools	Name of the Class	Number of Students		
			Boys	Girls	Total
Muslim MadyaMahaVidyalaya, Sammanthurai	National Schools	A	22	20	42
AI AshrakMadyaMahaVidyalaya, Kalmunai	National Schools	C	26	18	44
Total	02		48	38	86

Table- 3.2: Number of students taken from selected schools for ICT Method of Teaching.

Name of Schools	Type of Schools	Name of the Class	Number of Students		
			Boys	Girls	Total
Muslim MadyaMahaVidyalaya, Sammanthurai	National Schools	B	27	16	43
AI AshrakMadyaMahaVidyalaya, Kalmunai	National Schools	D	23	17	40
Total	02		50	33	83

These students were informed of the purpose of this test in advance to keep them aware of the research activity and to extend their co-operation and collaboration in fulfilling the objective of the research.

The limitation on the sample selection are:

- Although there are twelve 1AB schools and six National schools having A/L science classes in Kalmunai and Sammanthurai Zones, only two Tamil medium schools were selected.

- Due to inadequate IT facilities in school, classroom is the setting only for Chalk &Talkmethod of teaching as ICT method of teaching was conducted in the computer Learning Centre.
- The test is mainly based on opticsfor both Chalk &Talkmethod of teaching and ICT method of teaching A/L physics classes.

Hypothesis

The following two hypotheses were set to this investigation.

H_0 : There is no difference between Chalk &Talkmethod of teaching and ICT method of teaching student learning

H_1 : There is difference between Chalk &Talkmethod of teaching and ICT method of teaching student learning

Data processing and Analyzing the Marks Scored.

The marks obtained by the students at the post test in respect of the twomethods of teaching was listed and then, analyzedand compared. The aim of the quantitative study is to identify the performance of students using Chalk & Talk method and ICT method in both rural area and urban area schools.

To calculate the mean and median of the data, the Display Descriptive Statistics and Two Sample T-Test tools were used in Minitab 16.1 software. It assumed that the sample taken were randomly selected and were independent of each other.

Results and Discussions

Comparing the student's performance of Chalk talk method of teaching and ICT method of teaching in Kalmunai zone school.

The evaluated students post test marks of Chalk talk method of teaching in the in the Kalmunai zone school,namely KM/Al-ArshakMadyaMahaVidyalya (National School).is given Table 4.4.1.According to the major list of marks given in Appendix III

Table-4.4.1 Percentage of the post test marks for Chalk talk method of teaching in the Kalmunaizone school.

Chalk talk teaching method in Kalmunai zone school (44 students)							
23	43	35	34	23	54	56	78
60	56	50	55	43	42	49	28
42	39	61	39	40	42	29	39
55	64	35	42	62	57	82	31
62	42	32	29	15	61	42	35
53	41	62	48				

The following Histogram (with normal curve) reveals the performance of post test marks by Chalk talk method of teaching to students in the Kalmunai zone school, namely KM/Al-ArshakMadyaMahaVidyalya (National School). (Fig - 4.4.1)

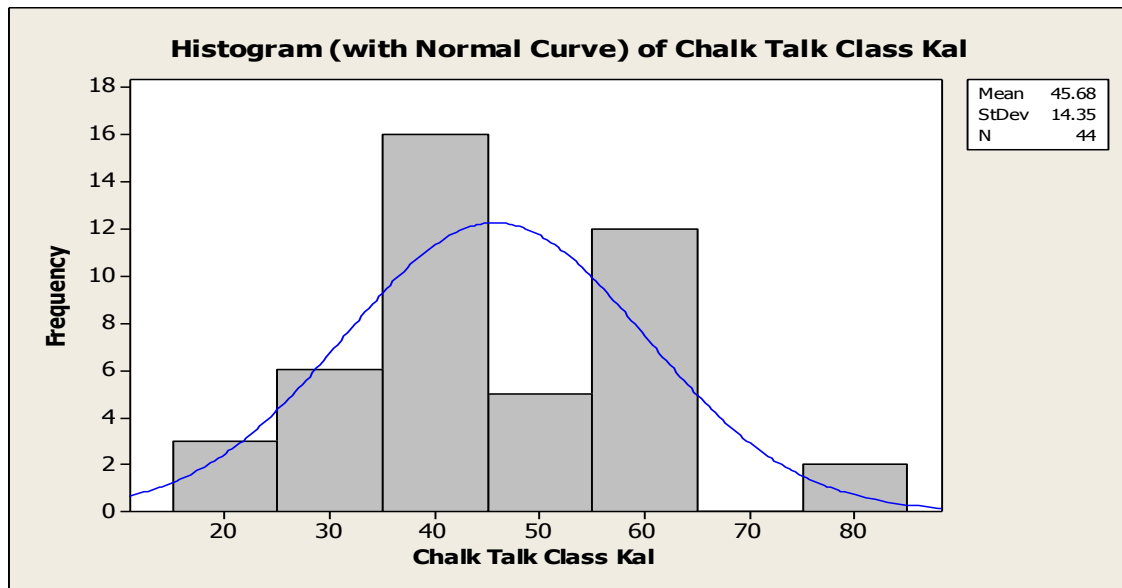


Fig – 4.4.1: Number of students obtained the post test marks by Chalk talk method of teaching in the Kalmunaizone school.

Table-4.4.2: Descriptive statistic information of mean and median of the post test marks by the Chalk talk method of teaching in the Kalmunai zone school.

Descriptive Statistics: Chalk Talk Class Kal							
Total							
Variable	Count	Mean	SE Mean	StDev	Minimum	Median	Maximum
Chalk Talk Class Kal	44	45.68	2.16	14.35	15.00	42.00	82.00

The evaluated students post test marks of ICT method of teaching to students in the Kalmunai zone school, namely KM/Al-ArshakMadyaMahaVidyalya (National School) is given Table 4.4.3. According to the major list of marks given in Appendix IV.

Table-4.4.3: Percentage of the post test marks for ICT method of teaching in the Kalmunai zone school.

ICT teaching method in Kalmunai zone school (40 students)							
67	65	64	52	35	41	30	75
47	58	60	60	70	49	79	65
57	68	83	75	49	63	59	75
68	69	56	67	85	62	75	64
75	64	12	98	82	63	64	82

The following Histogram (with normal curve) reveals the performance of post test marks by ICT method of teaching in the Kalmunai zone school, namely KM/Al-ArshakMadyaMahaVidyalya (National School). (Fig - 4.4.2)

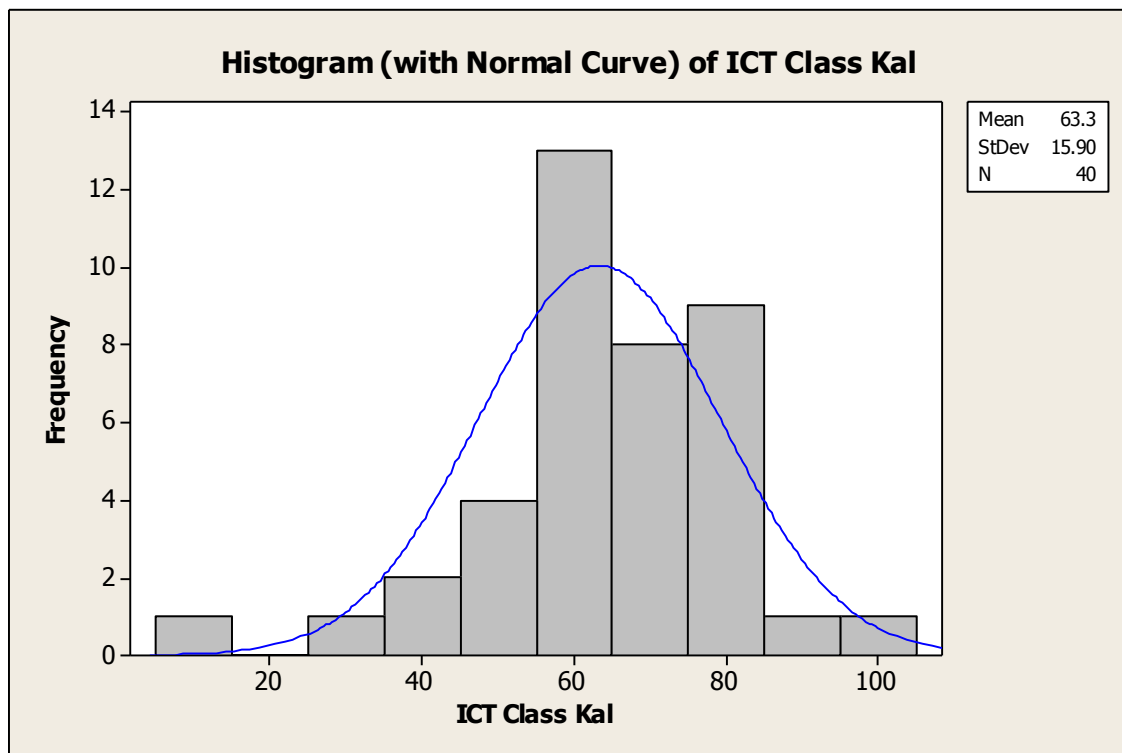


Fig – 4.4.2: Number of students obtained post test marks by Chalk talk method of teaching in the Kalmunaizone school

Table-4.4.4: Descriptive statistic information of the mean and median of post test marks by the ICT method of teaching in the kalmunai zone school.

Descriptive Statistics: ICT Class Kal							
	Total						
Variable	Count	Mean	SE Mean	StDev	Minimum	Median	Maximum
ICT Class Kal40	63.30	2.51	15.90	12.00	64.00	98.00	

In accordance with Table-4.4.1, Table-4.4.2, Table-4.4.3, Table-4.4.4, Fig 4.4.1 and Fig 4.4.2. It is clear that mean and median 45.68 and 42.00 of post test marks the 44 samples utilized for Chalk talk method of teaching students and also mean and median 63.30 and 64.00 of post test marks the 40 samples utilized for ICT method of teaching students in the Kalmunai zone school.

In other word there were 23 male and 17 female for ICT method of teaching. In this case 92% percentage students got the marks more than 40, other 30% percentage students got the marks more than 70 and one students got highest marks more than 90. Although there were 26 male and 18 female for Chalk talk method of teaching. In this case 65% percentage students got the marks more than 40 other 04% percentage students got the marks more than 70 and two students got highest marks more than 80 in the Kalmunai zone school.

Table-4.4.5:Two sample T- Test statistical information compare the post test marks by the ICT method of teaching to students and Chalk talk method of teaching to students in the kalmunai zone school.

Two-Sample T-Test and CI: ICT Class Kal, Chalk Talk Class Kal					
Two-sample T for ICT Class Kalvs Chalk Talk Class Kal					
	N	Mean	StDev	SE Mean	
ICT Class Kal40	63.3	15.9	2.5		
Chalk Talk Class Kal	44	45.7	14.3	2.2	

Difference = μ (ICT Class Kal) - μ (Chalk Talk Class Kal) Estimate for difference: 17.62 95% CI for difference: (11.02, 24.22) T-Test of difference = 0 (vs not =): T-Value = 5.31 P-Value = 0.000 DF = 78

Table-4.4.6: Two sample T-test result for compare both teaching methods in the Kalmunai zone school.

Teaching Methods(Kalmunai Zone)	Number of students	Median	Mean
ICT method of teaching	40	64.0	63.3
Chalk talk method of teaching	44	42.0	45.7

P value is 0.000

The following Box plot reveals the performance of post test marks by ICT method of teaching and Chalk talk method of teaching in the Kalmunai zone school, namely KM/Al-ArshakMadyaMahaVidyalya (National School). (Fig – 4.4.3)

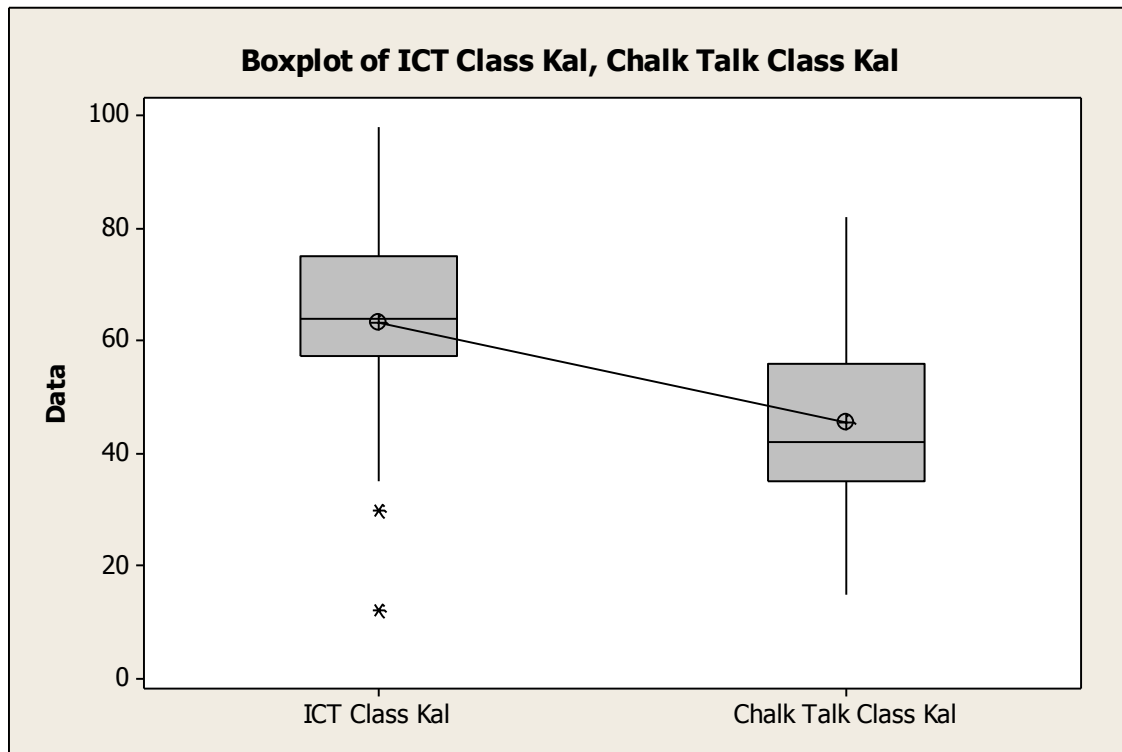


Fig – 4.4.3: Box plot depicts the post test marks by ICT method of teaching and Chalk Talk method of teaching in the kalmunai zone school.

The evaluated marks of ICT method of teaching students are given in Table 4.4.1. Over all comparison of the marks exhibits that the ICT method of teaching students have scored higher than chalk talk method of teaching students. In addition, the Two sample T-test and confidence interval clearly conform these results, since the mean and the median values are higher in the case of ICT method of teaching students in both zones schools and the test is significant at less than 0.05 level ($0.05 > 0.00$ P values is 0.00 level) (Table-4.4.5 and Table-4.4.6)

In accordance with the Table-4.4.6 it is clear that the significant level of the ICT method of teaching students is less than 0.05 when compared with that of Chalk talk method of teaching students.

As can be revealed, ICT method of teaching students shows better performance compared with that of Chalk talk method of teaching students. This can be seen from the calculation which shows the median and mean as 64.00 against 42.00 and 63.30 against 45.7 respectively in Kalmunai zone school.