A Study on Access of ICT Among Secondary School Students in Relation to their Academic Achievement

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Abstract

Information Communication Technology can affect the delivery of education and enable wider Access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. The question is often put whether ICT Access can really support and improve learning and the quality of instruction and, additionally, in which way, under which conditions and for what it can be useful. ICT Access enable learners to be self directed and to assume greater control over their learning. This paper focuses on ICT Access among secondary school students and aimed to find out how it related with their Academic achievement. Normative survey method was used in the study and random sampling was applied for the collection of data for the present study. The Background variables such as gender, locale of schools were considered for the study. The study results revealed that the ICT Access of secondary school students is found to be positively related with their academic achievement.

Keywords

Information Communication Technology (I C T), ICT Access, Academic Achievement, Secondary School students.

I. Introduction

Recently, Information Communication Technology has rapidly acquired an important place in society (Wang,2008) and is used increasingly as a learning tool in all forms and at all levels of education (Demiraslan & Usluel, 2008). Students differ in their experiences with and attitudes toward ICT. At home, not all children have the same access to ICT, and they may use ICT resources available at home differently than at school. Therefore, differences in ICT access, knowledge and skills develop amongst students. Because of these differences, the increasing role of ICT as a learning tool can cause problems for students with less experience with technology or less affinity for ICT (Volman, Van Eck, Heemsker & Kuiper, 2004). It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for learning by doing. ICT Access enable learners to be self directed and to assume greater control over their learning. This necessitates an investigation in the present status of ICT Access of secondary school Students and it's relation with their Academic achivement.

1. Operational Definitions of the Key terms :

Information Communication Technology (ICT): Information Communication Technology (ICT) is defined as diverse set of technological tools, devices and resources used to communicate, and to create, disseminate, store, and manage information for the purpose of learning.

ICT Access: The availability and opportunity to use of information communication technology equipments, devises and software resources as part of learning by secondary school students. Secondary school Students:The term refers to pupils studying in class VIII, IX and X of recognized high schools of Kerala state. *Academic Achievement:* The Academic Achievement is referred to the tangible accomplishments or proficiency of performance of secondary school students in the subjects of a class or grade level as measured by some tests.

2. Review of Related Literature:

The investigator has reviewed some of the related literature in this area. The important research works, reviewed here, were mainly relevant and restricted to the works done on Access of ICT and it's relation with Academic achivement. BECTA.(2000) investigated the relationship between ICT resources and pupil attainment in primary and secondary school and found a consistent trend for pupils in schools with better ICT resources to achieve better grades for English, Mathematics and Science. More than half of the schools with very good ICT resources were achieving above the national standards in science, compared with less than a third of schools with 'poor' ICT resources. There were similar results for English and Mathematics. Schools with very good ICT resources were found in a similar range of social contexts as schools with poor ICT resources.

Osborne, J., Hennessy, S. (2003), investigated teachers' and students' changing role strategies in the context of using various forms of computer-based information and communication technology to support subject teaching and learning at secondary level. One hundred and fifteen teacher researchers participated in a collaborative programme of small-scale, classroom-based projects involving development, evaluation and refinement of new pedagogic approaches, strategies and activities in six curriculum areas. An analysis was conducted across the case study data derived from lesson observations; follow up teacher interviews and teachers' written research reports. While interactions with individual students and small groups were increased and reportedly successful, mediating interactions between students and technology through whole-class interactive teaching, modelling and discussion appeared to be under-developed.

Deaney,R & Ruthuven, K (2003) studied pupils' views of the use of information and communication technology (ICT) within subject teaching and learning. Members of three year cohorts (Years 8, 10 and 12) in six English secondary schools took part in focus group interviews during the first half of 2000. The views elicited in the course of the 27 interviews are summarised in terms of six themes. Pupils saw computer-based tools and resources as helping not just to effect tasks and improve presentation, but also to refine work and trial options. They associated the use of such tools and resources with changes in working ambience and classroom relations, as well as with raised interest and increased motivation on their part. Valentine et al. (2005) found that parents and pupils believed that ICT improved motivation and confidence, made school work more enjoyable and improved achievement. They reported a statistically

small improvement in attainment in Mathematics and English linked to the home use of ICT for educational purposes at particular key stages, and concluded that home use brings advantages in terms of new sources of information, enhanced presentation and raised self-esteem which, in turn, affects attainment.

The review of studies reveal that the Access of modern ICT tools and resouces are important and challenging factors for 21st centuery students to attain academic excellence in an era of globelisation. A detailed study would help us to bring out the real picture of our students in this area.

3. Objectives of The Study

The Objectives formulated for the study were:

1. To find out the Access of ICT among secondary school Students.
2. To find out the relationship if any between ICT Access of Secondary School Students and their Academic achievement.
3. To find out the relationship if any between ICT Access of Secondary School Students and their Academic achievement in total sample and the sub-sample based on Gender and Locale.

4. Hypotheses of The Study

The Hypotheses formulated for the study were:

1. The Access of ICT among Secondary School Students is Low.
2. There is no significant relationship between ICT Access of Secondary School Students and their Academic Achievement for the total sample.
3. There is no significant relationship between ICT Access of Secondary School Students and their Academic Achievement in the baground variables based on Gender and Locale.

II. Methodology

(i) Sample

The total 500 Secondary school Students were selected as sample from six districts of Kerala giving due representation to South, North and Middle regions. The samples were selected from Trivandrum, Trissur, Malappuram, Calicut, Kannur and Kasargod Revenue Districts of Kerala through Stratified Random Sampling method.

(ii) Tools Used for The Study

A Check list for ICT Access of Secondary School Students was developed and standardised by the investigator himself and is mean to mesure the Access level of the Secondary school students in School environment , home environment and other Social environment. The tool has three parts with 31 items and maximum score 59 to check the availabity or non-availability of ICT tools and resources. The validity and reliability of the tool was established in a Pilot study.

(iii) Statistical Techiniqes Used for The Study

(a)Descriptive analysis (Mean, median, mode, Standard Deviation, Skewness and Kurtosis) (b) Differential analysis (Independent sample 't' test, One way ANOVA, Two way ANOVA with 3 x3 Factorial design). (c)Correction analysis (Carl Person's Coefficient of correlation) (d) Regression analysis.

III. Data Analysis and Results

1.The ICT Access of Secondary School Students with Respect to the Total Samples.

Table 1: Prelimanary Analysis of ICT Access for the Total Sample:

Variable	N	Mean	S.D	Skewness	Kurtosis
ICT Access	500	17.71	9.94	0.73	-.141

The table- No.1 above shows that the mean value of ICT Access is found to be 17.71 and the mean value of tool is 29.5 which is higher than the obtained value for the total sample. Therefore it can be concluded that the Access of ICT among Secondary School students is low for the total sample.
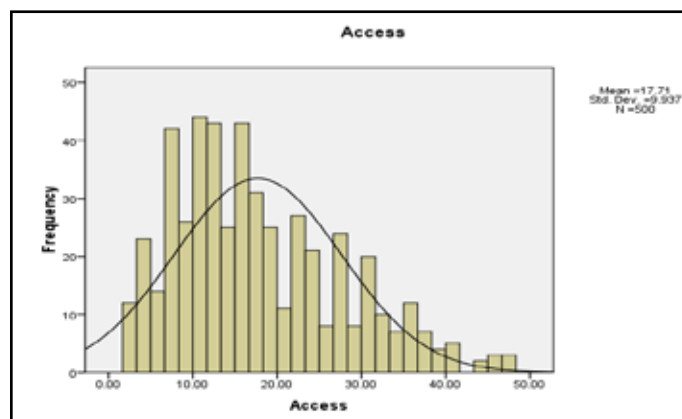

Fig. 1: Smoothed Frequency distribution of Access of ICT among Secondary school students.

The frequency distribution of ICT Access among Secondary school students for the total sample shows skewness. The larger frequencies tend to be concentrated towards the low end of the variable and the smaller frequencies towards the high end, the frequency distribution is considered to be positively skewed(Ferguson, 1971).

2. Significance of Difference between Mean Scores of ICT Access Among Various Categories of Sub- Samples:

Table 2: Mean Scores of ICT Access and Significance of Differences Among various catogories of Sub-Samples:

Variable		No	Mean	S.D	t- value	Sig. level
Gender	Boys	250	17.0200	9.87327	1.55	p>0.05
	Girls	250	18.3960	9.97181		
Locale	Rural	300	16.9967	9.75297	1.95	P>0.5
	Urban	200	18.7750	10.14		

The tables-2 above shows that, when the Mean scores of Boys and Girls on ICT Access were compared, it was found that there is no significant difference between Boys and Girls. The t-value obtained for the variable is below the table values 1.96, which indicates that the difference is not significant even at 0.05 level. When the Mean scores of Rural and Urban School students on ICT Access were compared, it was found that there is no significant difference between Rural and Urban school students. The 't' value obtained for the variable was 1.95 which was below the table value 1.96. This indicates that the difference is not significant at 0.05

level. It was found that there is no difference between Rural and Urban Secondary school students in ICT Access.

3. Significance of Difference between Mean Scores of Academic Achievement Among Various Categories of Sub-Samples:

Table 3: Mean Scores of Academic Achivment and Significance of Differences Among various catogories of Sub-Samples:

Variable		No	Mean	S.D	t- value	Sig. level
Gender	Boys	250	262.56	90.83	6.47	p<0.01
	Girls	250	313.38	84.78		
Locale	Rural	300	271.35	95.77	5.31	P<0.01
	Urban	200	312.9	78.21		

The table-No.3 above shows that, when the Mean scores of Boys and Girls on Academic Achievement were compared, it was found that there is significant difference between Boys and Girls. The obtained t-value (6.47) was above the table values 2.58. The result indicates that there is significant difference between Boys and Girls at 0.01 level.

The mean scores in Academic achievement of girls (Mean score: 313.38) were greater than Boys (Mean score: 262.56). The result reveals that Girls were better in Academic Achievement than Boys. When the Mean scores of Rural and Urban Secondary School students on Academic Achievement were compared. It was found that there is significant difference between Rural and Urban school students. The t-value obtained for the variable was 5.31 which was above the table value 2.58. This indicates that the difference is significant at 0.01 level. Further from the data it was found that Urban students scores higher in Academic Achievement (Mean score:312.9) than Rural Secondary school students (Mean score:271.35).

4. Correlation of ICT Access and Accademic Achievement for the Total sample and Sub smples:

Table 4 : Correlation between ICT Access and Academic Achivment for Total Sample and Sub-Samples:

ICT Access x Academic Achievement	r	t- Value	Sig. Level
Total Sample	0.234371	5.38	P< 0.01
Sub sample-Boys	0.195598	3.14	P< 0.01
Sub sample-Girls	0.255492	4.16	p< 0.01
Sub sample-Rural	0.273867	4.92	P< 0.01
Sub sample-Urban	0.132096	1.08	P> 0.05*

*Not Significant.

From the table No.4 above, it was found that the correlation between ICT Access and Academic Achievement of Secondary school students for the total sample and sub-sample Boys, Girls and Rural School students were significant at 0.01 level. But in the case of Urban secondary school students, the obtained 't' value is 1.08 which is below the table value 1.96 at 0.05 level. Hence there is no significant correction between ICT Access and Academic Achievement among Urban Secondary school students.

5. Regression Analysis for Single Predictor Variable - I C T Access for the Total Sample:

The regression analysis has been done for the predictor variable-ICT Access for the total sample and the summary of the analysis, beta values and the regression equations are given in the table No.5 below:

Table 5 : Regression Analysis for Single Predictor Variable-ICT Access for the Total sample:

Model	R	R-square	Adjusted R square	Standard Error
1	.234[a]	.055	.053	88.9256
	Sum of squares	Df	Mean Square	F
Regression	228890.64	1	228890.643	28.945*
Residual	3938071.9	498	7907.77	
Total	4166962.55	499		

Predictors (constant): ICT Access,   Depended Variable: Academic Achievement,* significant at 0.01 level.

The table No.5, above shows the value of the parameters of the regression analysis between the Single predictor variable ICT Access and Academic achievement for the total sample. The predictor variables taken against the criterion variable yielded a coefficient of correlations (R) of 0.234, and correlation square (R^2) of 0.055. The R^2 value translated into 5.5 % of the observed variance in the Academic Achievement scores. The analysis also gave a standard error (SE_R) of 88.92567 and F-value of 28.945 which is significant at 0.01 level of significance. The relative contribution of the single predictor variable-I C T Access has been established with the help of beta value.

Table 6 : Beta value and their significance in predicting Academic Achievement:

Model	Un standardized Coefficient		Stdzd Coefficient	t	Sig. Level
	B	Std. Error	Beta		
Constant	249.80	8.133		30.715	-
ICT Access	2.16	0.401	0.234	5.380	0.01

From the table- No.6 above, It is clear that the Beta value of ICT Access, was 0.234. The t value for the Beta value out of the Independent variable -ICT Access was 5.38. The respective 't' value for the beta value was statistically significant at 0.01 level. Therefore, it can be concluded that ICT Access is a significant predictor of the Academic achievement of Secondary school Students for the total Sample. To develop a regression equation for predicting the Academic achievement from the Single predictor variable- ICT Access, the following procedure has been used. Let the variable Academic achievement = Y, and Predictor variables X = ICT Access Score, Then the general regression equation of the criterion variables Y, in terms of the predictor variable, X is given by Allen G Blueman, (2012) : Y= M X+C (M= Coefficient,C= Constant) Hence the regression equation for the Total sample is given by Y= 2.16 x X + 249.802 Academic Achievement= 2.16x ICT Access score + 249.802. The graphical representation of the (Regression line) variable ICT Access and Academic achievement for the Total sample are presented Fig.2 below:
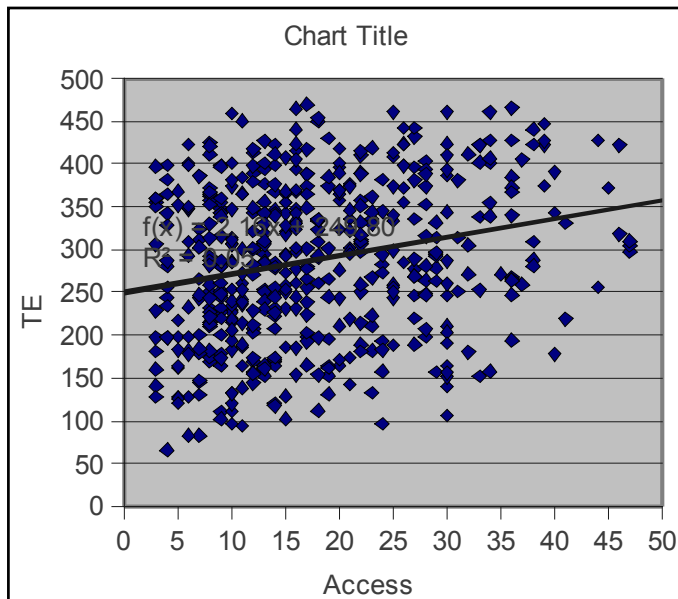
their valuable commends.

Fig. 2:Regression Line of Single PredictorVariable-ICTAccess and Academicachivement.(TE-Academic Achievement)

IV. Implications of the study

The role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century. It has also influence on student achievement. The present study would bring out an evaluation of the ICT implementation in education, especially among secondary level. It also gave an insight in to the reality regarding the contribution of ICT Access in Academic achievement of students. The study finding would help teachers, Students and Policy makers of Secondary education to formulate suitable strategies and programmes for implementing ICT in education.

V. Conclusions

The present research was intended to study the Access of ICT among Secondary school students in relation to their Academic achievement. The study results reveal that the ICT Access of Secondary school students were Low for the total sample and there was no significant difference between Boys and Girls in their Access of ICT. It was also found that in ICT Access there is no difference between Urban and Rural school students. In Academic achievement Girls excel Boys and Urban school students score better than Rural school students. The study also revealed that there was a positive correction between ICT Access and Academic Achievement of Secondary school students. The study results are in agreement with the findings of Kennewell & Morgan, 2006; Lim & Tay, 2003; Reece, 2005 who investigated the impact of ICT use on student achievement. The study results support the need of Access of ICT tools among secondary school students.

VI. Acknowledgement :

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