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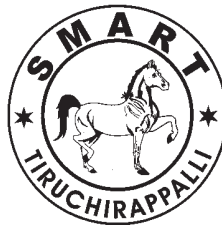
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Professor MURUGESAN SELVAM, M.Com, MBA, Ph.D, D.Litt
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**AN INVESTIGATION OF RURAL COLLEGE TEACHERS' AND
STUDENTS' ATTITUDE TOWARDS INTEGRATION OF ICT IN
EDUCATION: A COMPARATIVE STUDY**

Mahendiran. A*

*Research Scholar, Department of Management Studies,
Thanthai Hans Roever College, (Affiliated to Bharathidasan University),
Perambalur, Tamilnadu, India
mahisastra@gmail.com*

and

Priya. R

*Head & Assistant Professor, Department of Management Studies,
Thanthai Hans Roever College, (Affiliated to Bharathidasan University),
Perambalur, Tamilnadu, India
yaprimba@gmail.com*

Abstract

ICT - enabled teaching and learning has become one of the important modes of teaching and learning, adopted by majority of educational institutions, all over the world. This study was conducted to examine the rural teacher' and students' attitude towards ICT in higher education. Questionnaire method was adopted for this study, with two different sets of questionnaires, to assess their attitudes towards ICT in education. The teachers' questionnaire contained questions related to teachers' demographic information, attitude, uses of ICT in teaching and ICT in teacher professional development. Similarly, students' questionnaire consisted of questions related to students' demographic information, attitude, and uses of ICT in learning. The study revealed that rural college teachers' attitude towards ICT in education was positive and higher than the rural colleges' students' attitude towards ICT in education.

Keywords: *Digital divide, ICT, Collaboration and Professional Development*

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*** Corresponding Author**

1. Introduction

The geographical classification into rural and urban, makes important difference in the peoples' working, earnings, services and the life style. People from urban areas reported better living conditions than people from rural areas. Around 70% of Indian population live in rural areas. In some aspects, rural areas are better than urban in terms of cost of living, pollution, water facility etc. But there is a big economic gap between these two segments and also in many other aspects like technology access, quality education, infrastructural facilities etc. Digital divide, also called digital gap, is visible between urban and rural communities and inequality in access to technologies still exists in many States of India (**Ganesh. E.N, 2016**). **Rakeshkumar (2016)** stresses the need for the development of infrastructure, agriculture, employment and education for the communities in rural areas.

2. Review of Literature

Information and communication technology is the combination of information technology and telecommunication technologies, especially used in educational developmental activities. ICT enables interactivity among students and teachers in the teaching-learning process (**Pomerantz, L, 2001**). Though educational institutions in rural parts of India are not well equipped with the state of the art infrastructural facilities, the Government has taken the initiative to equip them in a phased manner (**Roy, Niraj Kumar, 2012**). Some special initiatives like National Programme on Technology Enhanced Learning (NPTEL), EDUSAT, virtual laboratories and virtual classrooms are worth mentioning (**Bhattacharya, Bani, 2008**). Introduction of any new technology, in any field, must be done in a phased manner and it is applicable to educational sector also

(**Barak.M,2007**). Teachers, who frequently use ICT tools and resources for their regular teaching, influence their students' learning activities, using ICT tools (**Hsu. S, 2011**). However, teachers' information literacy and self-efficacy depend on the passion for the frequent usage of ICT for teaching and learning (**Usluel, Yasemin Kocak, 2007**). It is often said that teachers, who are confident in the use of ICT tools, are more likely to use ICT for teaching process (**Smeets. E, 2005**). There are three categories of teachers' attitude-positive, neutral and negative attitude towards ICT and it depends on the subject they teach, their experience and gender (**Jimoyiannis, A., & Komis, V, 2007**). Course design and course delivery, using ICT tools, enable teachers to enhance student participation in the learning process (**Wu, Yenchun et al, 2017**). Teachers can extensively use caselets, a kind of short stories, as one of the teaching aids while preparing teaching materials (**M.Selvam, 2006**). Incorporating technologies in education is inevitable in order to enhance the teaching-learning process. In some cases, teachers' experience and background are the important factors that motivate students to choose particular electives. (**Sabita Mahapatra, 2016**). **Edmunds, R (2012)** found that students' attitude towards ICT was positive because of their usefulness and ease of use. ICT collaboration with social media in learning improves interactivity among students, that helps them to complete their home works and assignments (**Wu, et al, 2017**). Integration of technology in learning, motivates and engages students, to enjoy useful learning environment (**Martinez, M., 2009**). Majority of the teachers show positive attitude towards ICT but it varies with experience (**Erdogen Tezei, 2009**). **Umar, I. N., (2015)** presents the contrary view that the interest is low towards ICT integration

in teaching because of time constraint. However, it is very important that the knowledge on how to use ICT for teaching, makes big difference in the effective use of ICT in teaching. **Charles Alan Buckley (2000)** emphasizes that students require sufficient time to learn and be competent in the use of the technology for learning. The present study is consistent with the previous findings that majority of teachers and students favoured ICT in education.

3. Statement of the Problem

College education is the higher level education and it has direct impact on the students' career and employment. Any technological advancement may take some time to reach rural areas in general. In the case of education field, its impact would create imbalance between the students who graduated from urban areas and the students from colleges located in rural areas. Similarly, the use of such technologies in education, by teachers and students, would influence positively the teaching and learning process. When teachers learn and use educational technologies in regular teaching, then it would really kindle the students to use such technologies for their learning process. However, the interest and perception of teachers towards ICT in teaching and the interest and perception of students towards ICT, differ from each other.

4. Need of the Study

In a globalized market environment, students, who seek jobs after their higher education, have to face the challenges and satisfy the requirements of the companies, irrespective of the place they come from. Employers would set the same quality standards for all. There are many research studies conducted to study the attitude of students and teachers in schools and colleges, located in urban areas but no such empirical evidence is available for rural colleges.

When it comes to rural area, these two factors play a very vital role in the incorporation of ICT in education. The present study aims at finding the attitudes of teachers and students towards ICT in education.

5. Objective of the Study

This study was carried out to examine the rural college teachers' and students' view and use of ICT in education and to identify whether there was any significant difference between teachers' attitude and students' attitude towards ICT in education.

6. Hypotheses of the Study

H₁: There is significant difference in the attitudes of teachers and students towards ICT in education.

H₂: Positive factors have more effects on the students' opinion about the use of ICT in learning.

H₃: Positive factors have more effects on the teachers' opinion about the use of ICT in learning.

7. Research Methodology

Questionnaire method was adopted for this study. Since two categories of participants were involved in the study, two different sets of questionnaires were prepared. Students' questionnaire consisted of 93 questions, under demographic information, attitude, uses of ICT and impact ICT on learning. Similarly, teachers' questionnaire contained of 61 questions, under demographic information, attitude, uses of ICT in teaching and ICT in teacher professional development.

7.1 Sample Selection

Survey sampling methodology was adopted for this study. It is impossible to investigate every individual in the total population. Hence ten percent of the total population was selected for

the study. Three arts and science colleges in Perambalur were chosen for the study and the total student population was around 2500 in the three sample colleges. It was decided to collect data from 250 students, as per the recommended sample selection methodology.

7.2 Sources of Data

Questionnaires were distributed to 250 students, from three sample arts and science colleges in Perambalur and 206 were received. Similarly, 135 questionnaires were issued to teacher and 115 were returned.

7.3 Period of the Study

This study was carried out during the period between February 2019 and November 2019.

7.4 Tools used in the Study

The collected data were fed into SPSS software and it was stored as SPSS statistics data document (.sav) files. Further, the statistical analysis (Julie Pallant, 2007) was conducted to investigate the responses of various questions, listed in the research section.

8. Analysis of Rural College Teachers' and Students' View and Use of ICT in Education

To evaluate teachers' and students' attitude towards ICT, a paired t-test was carried out. **Table-1**, labelled Paired Differences between Teachers' Attitude and Students' Attitude, shows the value of sig. (2-tailed) to be 0.000, which was less than 0.005. Hence it indicated that there was significant difference between teachers' attitude and students' attitude towards ICT. **Table-2**, displays the mean scores of teachers' attitude and students' attitude. It revealed that there was statistically significant difference in the scores of teachers' attitude (M=4.03, SD=0.417) and the students' attitude (M=2.69, SD=0.579), t with (114) =20.354 and P<0.005 (two tailed). The score of mean difference was 1.346, with 95 percent confidence level. In other

words, teachers' attitude towards ICT was positive and higher than students' attitude. Seven items were identified as factors (positive and negative affect scale), that could influence the students' attitude and they were analysed by the PCA method. Factor analysis was carried out to check whether the data were suitable for the analysis, prior to the execution of the principal component analysis. **Table-3**, labelled, 'Correlation Matrix of Students' Opinion about the Use of ICT', shows the values of several coefficients to be ≥ 0.3 . **Table-4** shows the results of KMO and Bartlett's Test and the value was 0.812, which was greater than the recommended value of 0.6 (Kaiser, 1970, 1974). The statistical significance of sphericity was confirmed in the Bartlett's test, supporting the factorability of the correlation matrix. In other words, there were more positive effects on the students' opinion about the use of ICT in learning.

The sixteen items, identified as factors (positive and negative affect scale), that could influence the teachers' attitude, were analysed by the principal component analysis method. Factor analysis was carried out to check whether the data were suitable for the analysis, prior to the execution of the principal component analysis. Correlation matrix shows the occurrence of many coefficients with values ≥ 0.3 . **Table-5**, labelled 'Results of Teachers' shows the value of KMO and Bartlett's test to be 0.738, which was greater than the recommended value of 0.6 (Kaiser, 1970,1974) the statistical significance of sphericity was confirmed in the Bartlett's test, supporting the factorability of the correlation matrix. The results of Principal Component Analysis revealed the occurrence of two components, with initial Eigen values > 1, percentage of variance of 4.09, 2.2, 1.7 and 1.2 respectively. Teachers' Screeplot exposed an

obvious break after the second component. Hence only two components were retained for further analysis. **Table-6** shows that the influence of positive factors was more than the influence of negative factors, on the use of ICT in teaching, with the cumulative percentage of variance at 39.04, where component-1 recorded a value 25.57 percent and component-2 recorded a value 13.4 percent. In other words, positive factors did have more effect on the teachers' opinion about the use of ICT in learning. Further, oblique rotation was performed and the result indicated that there was very weak negative correlation between positive affect factors and the negative affect factors ($r = -0.007$).

9. Findings of the Study

The findings of this study revealed that both the teachers' and the students' attitude towards ICT in education, were positive. However, the comparative result revealed that the teachers' attitude was higher than the students' attitude.

10. Suggestions

A well-organized training programme on how to use ICT in teaching, may create interest among the teachers to learn and use ICT, for their regular class delivery. When teachers periodically use ICT, then it will directly stimulate interest among the students, to use ICT for their learning process.

11. Conclusion

The use of ICT will definitely improve the quality of education but just having the ICT facilities alone will not improve the quality. It is important to impart adequate ICT training to the people who use it. The study result revealed that the positive factors, that affect the students' opinion about the use of ICT, were higher than the negative factors and there was weak positive correlation between positive and negative

factors, with r value of 0.33. Rural college teachers have realized the necessity of transition from traditional teaching methods into technology enabled teaching process. The present study has established that the impact of ICT in teaching was high and it was determined by positive affect factors rather than by negative affect factors and there was negative correlation between positive and negative factors, with r value -0.007.

12. Limitations of the Study

This study considered only arts and science colleges in rural areas and excluded other higher educational institutions such as Engineering Colleges, Paramedical Colleges, Polytechnics and Teacher Educational Colleges.

13. Scope for Further Research

This research can be extended to all other higher educational institutions, located in Perambalur District, with more number of samples.

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**Table-1: Results of Paired Differences between
Teacher's Attitude and Students' Attitude**

<i>Paired Samples Test</i>									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Teachers' Attitude towards ICT - Students' Attitude towards ICT	1.346	0.709	0.066	1.215	1.477	20.354	114	0.000

Source : Primary Data (2019) using SPSS(v25.0)

Table-2: Results of Paired Samples Statistics between Teachers' Attitude and Students' Attitude

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Teachers' Attitude towards ICT	4.03	115	.417	.039
	Students' Attitude towards ICT	2.69	115	.579	.054

Source : Primary Data (2019) using SPSS(v25.0)

Table-3: Results of Correlation Matrix of Students Opinion about the Use of ICT

		Use of ICT have great impact on my learning process	ICT accelerate learning	Use of ICT improves my CGPA [Aggregate Mark]	Teacher should use ICT during teaching	Use of ICT for getting information is better than library	I cannot study with the use of ICT tools	I find it time consuming to use ICT in learning
Correlation	Use of ICT have great impact on my learning process	1.000	0.553	0.457	0.378	0.384	0.134	0.153
	ICT accelerate learning	0.553	1.000	0.497	0.495	0.432	0.272	0.333
	Use of ICT improves my CGPA [Aggregate Mark]	0.457	0.497	1.000	0.517	0.531	0.168	0.287
	Teacher should use ICT during teaching	0.378	0.495	0.517	1.000	0.379	0.258	0.355
	Use of ICT for getting information is better than library	0.384	0.432	0.531	0.379	1.000	0.268	0.199
	I cannot study with the use of ICT tools	0.134	0.272	0.168	0.258	0.268	1.000	0.394
	I find it time consuming to use ICT in learning	0.153	0.333	0.287	0.355	0.199	0.394	1.000

Source : Primary Data (2019) using SPSS(v25.0)

Table-4: Results of KMO and Bartlett's Test on Students' opinion about the use of ICT in Learning

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.812
Bartlett's Test of Sphericity	Approx. Chi-Square	395.536
	df	21
	Sig.	0.000

Source : Primary Data (2019) using SPSS(v25.0)

Table-5: Results of KMO and Bartlett's Test on Teachers' opinion about the use of ICT in Learning

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.738
Bartlett's Test of Sphericity	Approx. Chi-Square	535.963
	df	120
	Sig.	0.000

Source : Primary Data (2019) using SPSS(v25.0)

Table-6: Results of Factors Influencing Teachers' Opinion about the Use of ICT in Learning

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.092	25.574	25.574	4.092	25.574	25.574	4.092
2	2.155	13.467	39.041	2.155	13.467	39.041	2.155
3	1.731	10.817	49.858				
4	1.259	7.871	57.729				
5	0.957	5.984	63.713				
6	0.857	5.354	69.067				
7	0.819	5.118	74.186				

Table-6 contd.,

8	0.773	4.833	79.019				
9	0.604	3.777	82.795				
10	0.559	3.495	86.290				
11	0.445	2.784	89.074				
12	0.423	2.647	91.720				
13	0.413	2.580	94.300				
14	0.388	2.428	96.728				
15	0.283	1.769	98.498				
16	0.240	1.502	100.000				
Extraction Method: Principal Component Analysis.							
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.							

Source: *Primary Data (2019) using SPSS (v25.0)*