ORIGINAL ARTICLE

Attitudes of Higher Secondary School Teachers Towards Using New Technology: A Case Study of Imphal East and Imphal West Districts of Manipur

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ARTICLE HISTORY	ABSTRACT
	The success of schemes that provide opportunities to school students to build their capacity on ICT skills and make them learn through computer aided learning process primarily depends upon the attitudes of the teachers to the adoption of the new technologies. The present study explored the attitudes of the higher secondary school teachers of Imphal East and Imphal West districts of Manipur towards the use of new technology. The sample consisted of 350 teachers out of a total population of 706 teachers from 26 higher secondary schools. The Attitude towards Using New Technology Scale (ATUNTS) developed by Rajasekar was used for the study. The results indicated that the higher secondary teachers have positive attitude towards using new technology in teaching. Teachers of government and private schools; and young/junior and senior/old teachers differ significantly in their attitudes towards using new technology. *Keywords: Information and Communication Technology, attitude, schemes, pilot study*
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INTRODUCTION

New technologies are proliferating into the field of education in the last few decades and Information and Communication Technologies (ICT)have been globally introduced to revolutionize the educational system, facilitate students and ultimately accelerate national development in the contemporary information age. The National Policy on Education, 1986 and its subsequent amendments stressed the need to promote educational technology for improving the quality of education in India. In the lines of the policy, the Government of India (GoI)launched two major schemes namely i)Educational Technology (ET) scheme and ii)Computer Literacy and Studies in Schools (CLASS) scheme. Sensing the need for a more comprehensive scheme, the Information and Communication Technology (ICT) @ Schools scheme was launched in December, 2004 to provide opportunities to secondary and higher secondary school students to build their capacity on ICT skills and make them learn through computer aided learning process. The ICT @ Schools Scheme is a major catalyst to bridge the digital divide amongst students of various socio-economic and geographical barriers. It provides support to states and union territories to establish computer labs in schools on a sustainable basis. It also aims to set up smart schools to act as "Technology Demonstrators" and lead in propagating ICT skills among students of neighbouring schools. The Scheme covers both government and government-aided secondary and higher secondary schools. Financial assistance is provided for procurement of computers and peripherals; procurement of educational software; training of teachers; development of e-contents; internet connectivity; and setting up of smart schools all with the approval of the Project Monitoring and Evaluation Group (PMEG), Ministry of Human

Resource and Development (MHRD), Govt. of India. So far, 89266 schools have been covered all over India and 63 smart schools have so far been established in 12 States and 3 UTs under the ICT @ Schools scheme. For Manipur state, the scheme covers 325 schools and 4 smarts schools are approved by the PMEG, MHRD.

The significant role that ICT can play in school education is also highlighted in the National Curriculum Framework (NCF), 2005. The use of ICT figures in the Government of India's flagship programmes on education; and comprehensively in the norm of schooling recommended by the Central Advisory Board of Education (CABE) in its report on Universal Secondary Education, 2005. Here, the comprehensive choice of new technology for holistic development of education can be built only on a sound policy. Attitudes of students, school personnel and parents are an important and overlooked component in the successful integration of technology in education. There are reports of resistance of new technologies due to the fear of the unknown. In developing countries, there are also wild speculations about the necessity of educational reforms to accommodate new technologies and tools (Pelgrum, 2001).National programs have been of limited success as they were formulated without research and in non-educational realms (Benzie, 1995). In many cases computers were introduced into schools with no measures to enable the educators develop positive attitudes towards using the new tools(Young, 1991). Regardless of the extent of sophistication, technology will not be used unless faculty members have the skills, knowledge and attitudes (Baylor and Ritchie, 2002). That is, teachers should be effective agents to be able to make use of technology in the classroom.

Studies have been conducted world-wide on the attitudes of teachers towards using new technologies. The attitudes of the teachers are influenced by two main factors i.e. the external environment and the personal characteristics of the teacher (Sing and Khine, 2006).The issue of inadequate educational technology infrastructure in schools has almost faded as the costs involved for the infrastructure have become more and more affordable in recent years. But, the personal characteristics of the teacher is yet to be resolved and is still continuing to draw the attention of educational researchers, teacher educators, curriculum developers and stakeholders concerned with educational reforms. Studies conducted in various settings on the perspective of the teachers' characteristics that influence use of technology continue to addto the literatures on integration of education with technology. Understanding the common patterns related with the characteristics of the teacher in a particular social context may shed light to those responsible for transforming education in their own contexts. At present, there is limited work and information in Manipur, India on this problem especially for the higher secondary school teachers. The reported study of Singh (2012) for the state was confined only to the teacher educators. Hence a research position is made out to study the attitudes of the higher secondary school teachers of Manipur towards using new technologies in classrooms. The study was confined to the teachers of the higher secondary schools of Imphal East and Imphal West districts of Manipur. The main objectives of the study were:

1. To study the attitudes of the higher secondary school teachers of Imphal East and Imphal West districts of Manipur towards using new technologies in classrooms;
2. To study the attitudes of the higher secondary school teachers in relation to their genders;
3. To study the attitudes of the higher secondary school teachers in relation to the type of the school (i.e. private or government schools);
4. To study the attitudes of the higher secondary school teachers in relation to their subject stream; and
5. To study the attitudes of the higher secondary school teachers in relation to their age.

For the study, the following hypotheses were formulated:

1. Higher secondary school teachers of Imphal East and Imphal West districts have negative attitudes towards using new technologies.
2. There is no significant difference between male and female higher secondary school teachers in their attitudes towards using new technologies.
3. There is no significant difference between higher secondary teachers of private and government schools in their attitudes towards using new technologies.
4. There is no significant difference of attitudes between the higher secondary school teachers of arts and science streams towards using new technologies.
5. There is no significant difference between senior/old and junior/young higher secondary school teachers in their attitudes towards using new technologies.

MATERIALS AND METHODS

The study is descriptive and exploratory in nature. Exploratory studies are most advantageous when not much has been written about the topic or the population being studied (Creswell, 2003).Teachers

considered for the study were teaching in schools recognised by the Council of Higher Secondary Education, Manipur and only teachers teaching arts and science subjects were considered in the study. Teachers whose age were equal or above 50 years were treated as old/senior teachers in the study whereas, teachers whose age were below 50 years were treated as young/junior teachers in the study.

Population

The target population of the study was higher secondary school teachers of Imphal East and Imphal West districts of Manipur, India during the school years2012-13 and 2013-14. The details of the higher secondary schools in the two districts and the number of teachers gathered by the investigator are at Table 1.

Sample

The total no. of teachers for the above 26 nos. of higher secondary schools of Imphal East and Imphal West districts of Manipur was 706. The minimum sample size (n) was decided from the following mathematical equation:

$$n = \frac{(z^2 \times p \times q) + ME^2}{ME^2 + \frac{z^2 \times p \times q}{N}} \qquad \text{Eq. (1)}$$

wheren =sample size, z =critical score for which the cumulative probability is 1- significance level=1.96 for 0.05 level of significance, p =precision value =0.5, q =1- p, ME=margin of error =±0.04, N=size of population studied.

350 samples were selected through random sampling using Tippet's table.The specific procedure used for sampling involved assigning each subject in the population to a number, and then selecting 350 arbitrary numbers from the population. Since each number corresponded to a subject in the population, the selected numbers formed the sample of subjects for the study.

Tools and Techniques

The Attitude towards Using New Technology Scale (ATUNTS) developed by Rajasekar, 2009 was used for the study. The scale is of Likert type scale and consists of 30 statements standardized on higher secondary school teachers of Ernakulum district, Tamil Nadu. The scale was developed for the following dimensions:

Hardware	*-Materials used in classroom*
	-Economy of hardware
	-Impact of hardware
Software	*-Software programme*
	-Economy of software programme
	-Impact of software programme

An individual's score is the sum of the scores of the 30 items. The score ranges from 30 to 150. Higher score indicates the favourable attitude towards using new technology in teaching and the scoring pattern is as shown in Table 2.The intrinsic validity is 0.98 and the reliability of the scale is 0.95 (Split-half technique followed by use of Spearman-Brown prophecy formula).

Pilot study

The ATUNTS scale was administered in person to 100 higher secondary school teachers of Imphal West district to determine the significance of the scale's 30 statements in the context of the state. The responses of the teachers were scored and their marks were converted into percentages and based on the marks secured all the score sheets were arranged in the descending order from the highest score to the lowest score. 25 percent of the subjects (i.e. 25 nos.) with highest total scores and 25 percent of the subjects (i.e. 25 nos.) with lowest total scores were selected forming the criterion groups (Edward, 1957). Each statement of the scale was taken separately and the number of teachers who responded to strongly agree (SA), agree (A), undecided (UD), disagree (DA) and strongly disagree (SD) was found out in both the high and low groups separately. The raw scores were converted into 't' scores for interpretation of the results. The 't' value is a measure of the extent to which a given statement differentiates between the high and low groups. The average response of the high and low groups to a statement differs significantly if the't' value is equal to or greater than 1.75.

The ATUNTS with the selected statements was finally administered to the selected 350 teachers through student teachers volunteers or the principals of the schools. A formal request was also furnished to the participants. The participating teachers were explained about the process for filling up the scale and assurances were given that the information supplied will be confidential for the participant. The participating teachers were requested to complete the responses immediately on the day they were supplied the scale.

The means and standard deviations of the attitudes towards using new technology were computed

directly from the respective raw scores for the entire sample of the higher secondary teachers with the help of SPSS software. The difference in mean of the raw scores for the variables i.e. gender, subject stream, nature of the school (government or private) and age of the teachers was tested for significance ('z' test) as below:

$$z = \frac{M2 - M1}{\sigma d} \qquad \text{Eq. (2)}$$

where M_1 is mean of first sample, M_2 is mean of second sample and σ_d is the standard error of difference between means.

$$\sigma d = \sqrt{\frac{\sigma1^2}{N1} + \frac{\sigma2^2}{N2}} \text{Eq. (3)}$$

whereσ_1 and σ_2 are the standard deviations of the first and second samples and N_1 and N_2 are the sizes of the first and second samples, respectively. Anull hypothesis is rejected at 5% level of significance when the 'z' value is equal or greater than 1.96 and at 1% level of significance when the 'z' value is equal or greater than 2.58 (Garrett, 2009).

RESULTS AND DISCUSSION
Initial characteristics of the sample
350 numbers of teachers were selected through random sampling from the total population of 706 teachers of higher secondary schools of Imphal East and West districts of Manipur for significance level 0.05. The characteristics of the sample for the study are shown in Table 3.
Pilot study
The ATUNTS consisting of 30 statements was standardised through administration of the scale to the higher secondary school teachers of Ernakulum district, Tamil Nadu. The same was administered to 100 higher secondary school teachers of Imphal West district as pilot study. The order of the 30 statements was rearranged based on the 't' value as shown at Table 4. If the 't" value is equal to or greater than 1.75, it indicates that the average response of the high and low groups to a statement differs significantly, provided there are 25 or more subjects both in the high and low groups (Edward, 1957).The 't' values of all the 30 statements were equal or greater than 1.75 and they were retained for the study. The 30 statements were administered to all the 350 teacher samples selected from Imphal East and West districts.
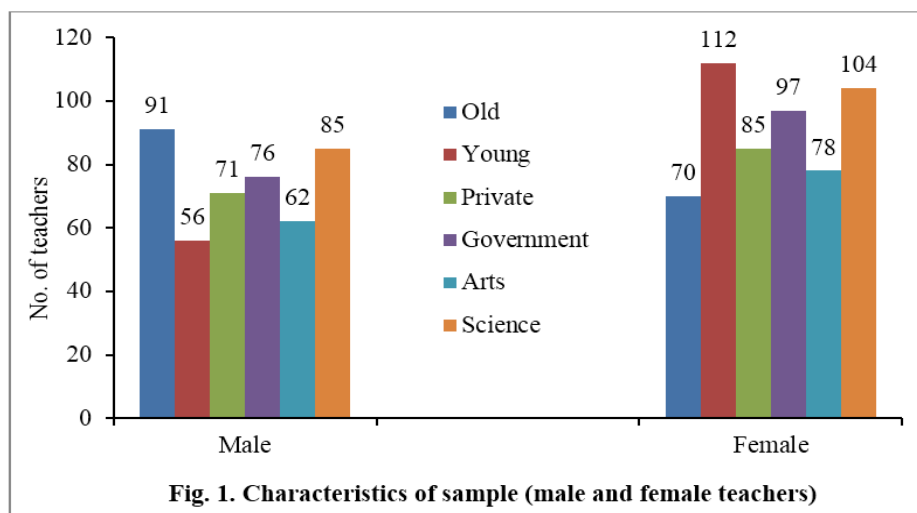

Fig. 1. Characteristics of sample (male and female teachers)

Attitude of the teachers
21 responses could not be used for analysis as they were not completely filled and only the remaining 329 responses were analysed giving a response rate of 94.0%. At that response rate, there was no need for further survey.The average score of the 329 samples was 93.3 suggesting that the average attitude of the teachers towards new technology was in the neutral range of the ATUNTS. Hence, hypothesis i. "Higher secondary school teachers of Manipur have negative attitudes towards using new technologies" is therefore, rejected. The hypothesis "Higher secondary school teachers of Manipur have positive attitude towards using new technologies" may be formulated.

The characteristics of samples for male and female secondary school teachers are shown in Fig. 1. The number of science stream teachers is more than arts stream teachers because majority of the private secondary schools are for science courses only. The ATUNTS scores of the male and female teachers are shown at Table 5. The T scores indicate that female teachers have more favourable attitudes than male teachers. The mean value of the attitude scores for male and female teachers towards using new technology was tested for significance. The 'z' value (0.47)was less than 1.96. Therefore, the difference in the mean score was not significant at 0.05 level of significance. Hence, the null hypothesis that there is no significant difference between male and female higher secondary school teachers in their attitudes towards using new technologies is accepted.

The characteristics of the samples for government and private higher secondary school teachers are shown at Fig. 2. The mean value of the ATUNTS score of the teachers of the government and private higher secondary schools towards using new technology was tested for significance (Table 6).The 'z' value (13.2) was more than 2.58. Therefore, the difference in mean score was highly significant at 0.01 level of significance. Hence, the null hypothesis that there is no significant difference between higher secondary teachers of private and government schools in their attitudes towards using new technologies was rejected. The T score of the higher secondary school teachers of private schools (8773) is greater than the T score of the higher secondary school teachers of government schools (7683). This indicates that private higher secondary school teachers show more positive attitude towards using new technology compared to government higher secondary school teachers.

The characteristics of the sample for science and arts stream teachers are shown in Fig. 3. The mean value of the ATUNTS score of the higher secondary school teachers of science and arts stream towards using new technology was tested for significance (Table 7). The 'z' value (1.40) was less than 1.96 and therefore, the difference in mean was not significant (0.05 level). Hence, the null hypothesis that there is no significant difference between arts and science higher secondary school teachers in their attitudes towards using new technologies is accepted. The T score of the higher secondary school teachers of science stream (9327) is greater than the T score of the higher secondary school teachers of arts stream (7129). This indicates that private higher secondary school teachers show more positive attitude towards using new technology compared to government higher secondary school teachers.

The characteristics of the samples for old/senior and young/junior teachers are shown in Fig. 4. The number of senior teachers in private schools was low. The ATUNTS scores of the senior/old and junior/young teachers are shown at Table 8. Junior teachers have more favourable attitudes than senior teachers as indicated by the T scores. The mean value of the attitude scores of senior and junior teachers towards using new technology was also tested for significance. The 'z' value (10.73) was more than 2.58. Therefore, the difference in the mean values was found to be significant. Hence, the null hypothesis that there is no significant difference between senior and junior higher secondary school teachers in their attitudes towards using new technologies was rejected. The new hypothesis formulated is, "There is significant difference between senior and junior higher secondary school teachers in their attitudes towards using new technologies".
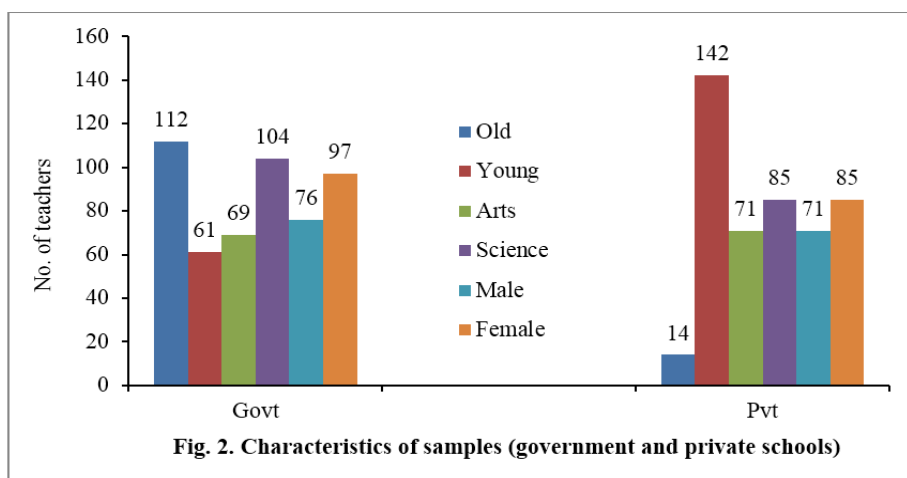

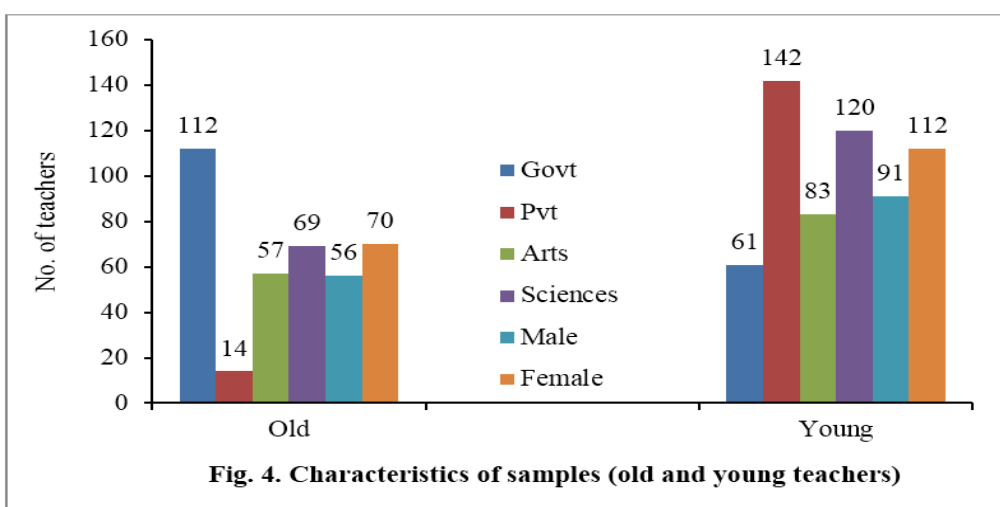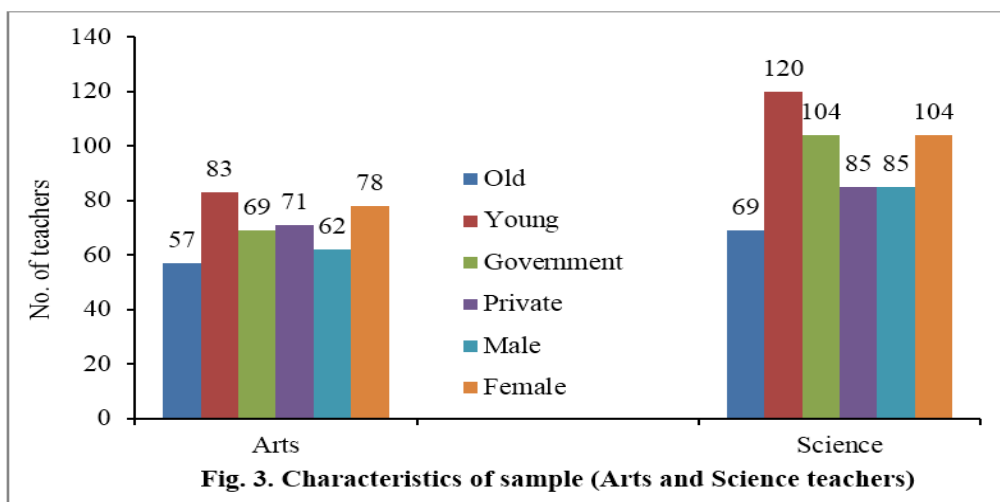**Fig. 2. Characteristics of samples (government and private schools)**

Fig. 3. Characteristics of sample (Arts and Science teachers)

Fig. 4. Characteristics of samples (old and young teachers)

Table 1. List of higher secondary schools of Imphal East and Imphal West districts

Sl. No.	Name of school	No. of teachers
	Imphal West	
1	Jhonstone Higher Secondary School, Imphal*	54
2	Ibotonsana Higher Secondary School, Imphal*	46
3	Model Higher Secondary School, Takyel, Imphal*	46
4	TG Higher Secondary School, Imphal*	70
5	Nilapadma Higher Secondary School, Sekmai*	8
6	Ramlal Paul Higher Secondary School, Imphal*	30
7	Bless Academy, Tera Bazar, Imphal	18
8	Brajalal Institute of Sciences, Imphal	21
9	Comprehensive Concept School, Sangaiprou	20
10	Dineswori Higher Secondary School, Canchipur	18
11	Elite Senior Secondary School, Singjamei	18
12	HRD Academy, Ghari	24
13	Herbert School, Sangaiprou	22
14	JIM Higher Secondary School, Sangaiprou	18
15	MEM Higher Secondary School, Sangaiprou	16
16	Modern Senior Secondary Academy, Thangmeiband	18
17	MECI Explorer Academy, Changangei	20
18	COMET, Changangei	21
	Total	488
	Imphal East	
1	Ananda Singh Higher Secondary Academy, Imphal*	44
2	CC Higher Secondary School, Imphal*	50

3	Lamlong Higher Secondary School, Lamlong*	29
4	Brighter Academy, Imphal	24
5	Don Bosco Higher Secondary School, Chingmeirong	16
6	Pioneer Academy, Imphal	18
7	Royal Academy of Science, Imphal	21
8	Sacred Heart Higher Secondary School, Porompat	16
	Total	218

*State government schools

Table 2. Scoring pattern and interpretation of ATUNTS score

Scores	Interpretation
30 - 40	Highly unfavourable attitude
41 - 65	Unfavourable attitude
66 - 115	Neutral
116 - 140	Favourable attitude
141 - 150	Highly favourable attitude

Table 3. Initial characteristics of the sample teachers

Sl. No.	Particulars of the teachers	Total
1	Male teachers	161 (46.0)
	Female teachers	189 (54.0)
2	Science Stream teachers	197 (56.3)
	Arts Stream teachers	153 (43.7)
4	Government school teachers	185 (52.9)
	Private school teachers	165 (47.1)
5	Senior teachers	141 (40.3)
	Junior teachers	209 (59.7)
	Total	350 (100.0)

* *Figures in parenthesis indicate percentage*

Table 4. Rank order of the items in the ATUNTS based on 't' value

Rank order	Nature of the statement	't' Value	Original Rank Order	Statements selected
1	Negative	4.35	1	Selected
2	Positive	4.24	2	Selected
3	Positive	4.12	3	Selected
4	Negative	4.08	4	Selected
5	Positive	3.85	5	Selected
6	Negative	3.75	6	Selected
7	Negative	3.65	7	Selected
8	Negative	3.52	8	Selected
9	Negative	3.41	9	Selected
10	Positive	3.36	10	Selected
11	Negative	3.21	11	Selected
12	Negative	2.98	12	Selected
13	Negative	2.76	13	Selected
14	Positive	2.65	14	Selected
15	Negative	2.55	15	Selected
16	Negative	2.45	16	Selected
17	Positive	2.35	17	Selected
18	Positive	2.30	18	Selected
19	Negative	2.27	19	Selected
20	Positive	2.21	20	Selected
21	Negative	2.14	21	Selected
22	Negative	2.04	23	Selected
23	Positive	1.98	22	Selected
24	Positive	1.92	24	Selected
25	Positive	1.89	25	Selected
26	Negative	1.86	26	Selected
27	Negative	1.80	28	Selected
28	Positive	1.79	27	Selected
29	Positive	1.77	29	Selected
30	Negative	1.75	30	Selected

Table 5. Attitudes of the male and female teachers towards using new technology

Sl. No.	Gender	No.	Mean score	T score	Standard deviation	'z' value
1	Female	182	93.9	9146	24.5	0.47
2	Male	147	92.6	7310	24.7	

Table 6. Attitudes of the teachers of government and private higher secondary schools towards using new technology

Sl. No.	*Govt./Pvt.	No.	Mean score	T score	Standard deviation	z value
1	Government	173	79.5	7683	19.8	13.2
2	Private	156	108.6	8773	19.8	

*Government/Private

Table 7. Attitudes of the higher secondary school teachers of science and arts stream towards using new technology

Sl. No.	Subject stream	No.	Mean score	T score	Standard deviation	'z' value
1	Science	189	91.7	9327	24.0	1.40
2	Arts	140	95.7	7129	25.2	

Table 8. Attitudes of the senior/old and junior/young teachers

Sl. No.	Senior/Junior	No.	Mean score	T score	Standard deviation	'z' value
1	Junior	182	103.2	10966	21.4	10.73
2	Senior	147	77.5	5492	20.8	

CONCLUSIONS

The study revealed that teachers of private schools, science stream teachers, young teachers and female teachers had more positive attitudes towards use of new technologies for teaching learning purposes as compared to their counterparts. The difference was significant for government and private school teachers; and for young and senior teachers. There is need to facilitate the higher secondary school teachers of the state for further development of positive attitudes towards use of new technologies.The adverse attitudinal aspects of teachers area stumbling block in implementation and utilization of ICT in classrooms. Relevant programmes are required to be taken up by the government to infuse the use of technologies in the mind-set of the teachers. Future research on the correlation of the attitude of the teachers with other factors is also needed for the policy makers and planners in the field of education

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