# Analysis of Situation of Integrating Information and Communication Technology in Indian Higher Education

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## ABSTRACT

India is a growing ICT country in the world. In the most recent research findings ICT provides us several ways of learning and it also affects teachers by providing alternative teaching styles. With the use of the latest technology, teachers can grasp the significance of technology. To use it efficiently and creatively, the teacher should have right and positive attitude. By keeping this thing in view, the concerned study describing the attitude of Indian teachers towards ICT in education in relation to their affiliation with the University is conducted. More than three hundred teachers from different faculties of six universities located in two states of India have participated in the academic year 2015. The statistical test like Z-test and T-test at 5% confidence level proves that University affiliation did not affect the teachers' attitude towards ICT in higher education.

## KEYWORDS

*Higher Education, ICT, Attitude, Private teacher, Government teacher.*

## 1   INTRODUCTION AND RELATED WORK

After 69 years of independence, a long-time span, the name of India is now added up with the name of developed countries i.e. America, China, England, Russia, Japan, and Russia etc. India's higher education system is the third largest in the world, next to the United States and China. Indian higher education system is controlling and managing through one major regulatory body, indirectly by the Ministry of Human Resource Development (MHRD), New Delhi. The educational structure consists of universities established by an Act of Parliament for Central university and of a State Legislature Act for state universities. Deemed universities can award their own degrees through central government notification. Institutions established State Legislative Act and colleges affiliated to the University (both government -aided and –unaided). Information is regarded as a collection of raw data, consisting of symbols, signs, signals & surrogates that can be compiled into messages (text, audio, images or digital) for communications (Prasher R., 2002).

The victory of Information and communication technology (ICT) in teaching and learning depends powerfully upon the commitment of both teachers and students in education. The competent use of ICT resources by teachers and students is very necessary in educational institutions. Educators are expected to be the leaders of this educational revolution. ICT is essential to any higher education institution that hopes

to succeed in a 21st-century world driven by intense globalization. (Kumar K. & Patil S.,2013) found that there is a significant difference between private and government secondary school teacher's attitude towards using new technology. This indicates that private secondary school teachers show their positive attitude towards using new technology compared to government secondary school teachers. But on the other hand (Shah S. & Thoker A., 2013) proved significant difference between teaching attitude of government and private secondary school teachers, the government secondary school teachers have higher teaching attitude towards their teaching profession as compared to private secondary school teachers. (Poonam & Bala S.,2014) found a significant difference between government and private school teacher's opinion towards the availability of computers for non-teaching staff. According to (Meenatchii B.,2015) there is a significant difference in the attitude towards using ICT in teaching between the types of institutions and private teacher educators have a greater attitude in using ICT for teaching. (Thakur G.,2014) described that Indian government schools have no quality neither latest ICT infrastructure and the lack of ICT enabled train teachers to instruct students.  (Joy J. & Sirhari M., 2015) and (Nikkah Z., & Mehra V.,2014) also wrote strong literature about the attitude analysis of Indian teachers. The present paper is written to explore the attitude of Indian teachers towards ICT using differential analysis.

T and Z tests are the two-popular statistical hypothesis testing methods which are mostly used to compare the statistical mean of samples. The T-test is also referred as the "Student T-test". It is appropriate to use when a limited sample size is given such as less than 30 and we are not aware of the standard deviation (SD) of samples. On the other hand, Z-test is also playing a vital role to test hypothesis having more than 30 observations. For apply Z-test, it is a requirement of prior calculation of standard deviation of samples. To apply the differential analysis of samples, the authors applied both T-test and Z-test which are appropriate. Both of statistical tests find the significant mean difference of two independent samples. The proposed null and alternate hypotheses are tested using both tests at 5% confidence level.

## 2      OBJECTIVE AND HYPOTHESIS

The present study is conducted with the objective to find a significant difference between the attitude of government and private University teachers towards information and communication technology in education. Therefore, we build one null hypothesis and its corresponding alternate hypothesis for a said objective which is mentioned below:

H01: There is no significant difference between the attitude of government and private University teacher towards information and communication technology in education.

H01A: There is a significant difference between the attitude of government and private University teacher towards information and communication technology in education.

## 2      DESIGN AND METHODOLOGY

The present study includes a quantitative and an empirical method. A descriptive survey method with stratified random sampling technique is applied to collect primary data of 344 teachers from six universities with the help of "5- point" liker type structured questionnaire during the academic year 2015. The research instrument used 35 questions describing ICT five factors such availability, usability, problem, solution, and opportunity. For the selection of variables Item analysis test (DV–DP test by Kelley's in 1939) has been applied. This study includes 35 dependent and 2 independent variables only.
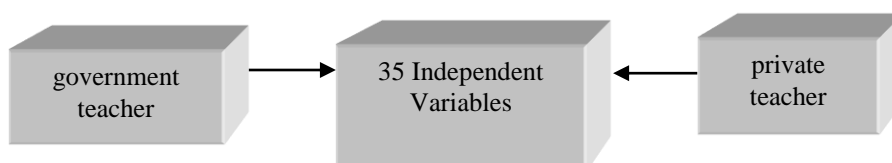


**Figure 1** Dependencies of teacher affiliation on attitudinal variables

Figure 1 shows a schematic view of both types of variables dependent and independent. It shows the dependency of 4 independent variables on 35 dependent variables. There are 35 variables defined for measure the attitude of the teacher towards ICT affected
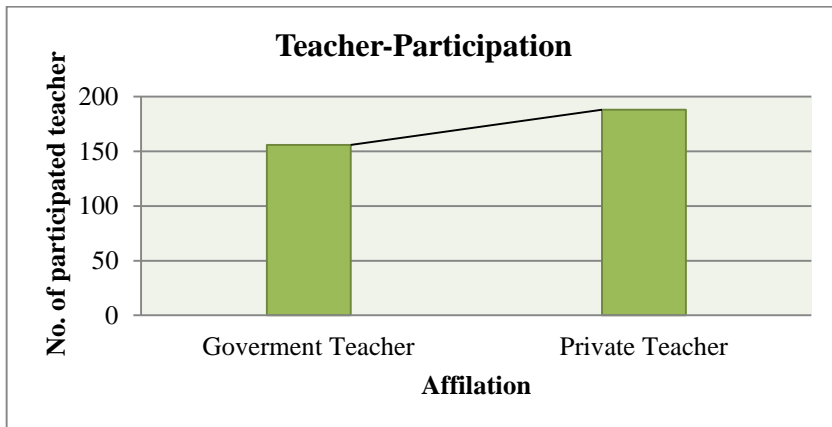


**Figure 2** Teacher's affiliation

Figure 2 depicts high participation of a private University and out of 344 teachers 156 were government and 188 teachers belonged to private universities.
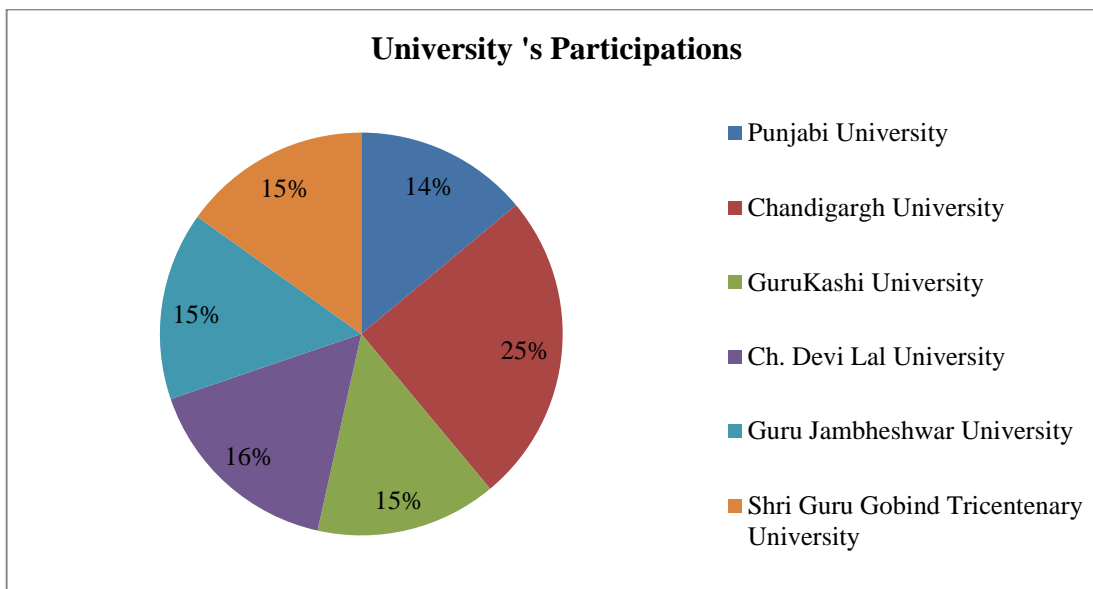


**Figure 3** Participation of universities

Figure 3 shows the participated universities from two states of India. The upper three universities are situated at Punjab state and lower three universities are located at Haryana state. The maximum responses collected from Chandigarh University. The maximum teachers (25%) were from Chandigarh University and minimum teachers (14%) were from Punjabi University. Out of 344 teachers, 156 were from government and 188 were from private universities have participated. Out of 6 universities, three had private affiliation and the rest had government affiliation.

## 4    RESULTS AND DISCUSSION

The collected data set of 344 teachers have been evaluated using popular Microsoft data analysis tools in MS-Excel 2007.For testing, null hypothesis H01 "There is no significant difference between the attitude of government and private University teacher towards information and communication technology in education" both T-test and Z-test at 5% significant level for 68 degrees of freedom are applied. The following Table 1 showing combined results of both applied tests. We have calculated the two values named

Z-Value and T-Value and then after comparing these values with their corresponding observed values which are table value in the statistic.

**Table 1** T-test and z-test on h01 at 5% significant level

| T& Z- Static | government teacher | private teacher | Status |
|---|---|---|---|
| Mean | 362 | 3.85 | |
| Variance | 0.07 | 0.06 | |
| Calculated T-Value | 0.44 | | |
| Observed T-Value | 2.0 | | Failed to Reject |
| Calculated Z-Value | 0.44 | | |
| Observed Z-Value | 1.96 | | |
| Significant at 5 % Level | Not Significant at 5 % | | |

Table 1 reveals that calculated values for both Z and T are smaller than their corresponding observed values at 5 % level of significance for 68 degree of freedom which is not significant at this level (1.96|>|0.44|<|2.0). Therefore, the mean difference between government teachers and private University teachers is identical here. In this case, null hypothesis H01 "There is no significant difference between the attitude of government and private University teachers towards information and communication technology in education" is found failed to reject which reveals no meaningful mean difference between private and government teacher towards ICT for their University affiliation status.  Hence our alternate hypothesis H01A "There is a significant difference between the opinion of government and private University teacher towards information and communication technology", it failed to accept here. Thus, it is concluded that there is no significant difference between the attitude of private and government teachers towards ICT. Further, to discover the mean difference between 156 government teachers and 188 private University teachers towards five factors, we have applied both T-test and Z-test at 5% significant level for varying degree of freedom.

**Table 2** ICT factor mean difference of government-private university teachers using t-test

| T-Static | Availability | Usability | Problem | Opportunity |
|---|---|---|---|---|
| Calculated T-Value | 0.53 | 1.63 | 1.16 | 1.16 |
| Observed T-Value | 2.10 | 2.14 | 2.77 | 2.11 |
| Degree of Freedom | 18 | 14 | 8 | 16 |
| Significant at 5% confidence level | Not Significant at 5% Level | | | |

Table 2 exploring findings of T-test after applying on 344 samples of teachers from private and government universities. The calculated T-values are smaller than observed T- values for five factors at 5% significant level. These values are not significant at 5% level. Though, there is no meaningful difference between government teachers and private University teachers for these factors. Therefore, there is no significance between opinions of government teachers and private University teachers towards availability, usability, problem, solution and opportunity factors. The second alternative is to evaluate the mean difference

between private and government teachers is Z-test. We used Z-test at 5% significance level for known variances. Following Table 3 is presenting the Z-values for various factors under consideration.

**Table 3** Factor mean difference between government-private university teachers using z-test

| Z-Static | Availability | Usability | Problem | Solution | Opportunity |
|---|---|---|---|---|---|
| Calculated Z-Value | 0.53 | 1.60 | 1.15 | 0.32 | 0.56 |
| Observed Z-Value | | | 1.96 | | |
| Significant at 5% confidence level | | | Not Significant at 5% Level | | |

Data from Table 3 shows that calculated Z-values are smaller than the observed Z-values at 5% significant level for five factors. Hence these values are not significant at 5% level. It is found that no meaningful difference in between mean value of private and government teachers for these five factors.
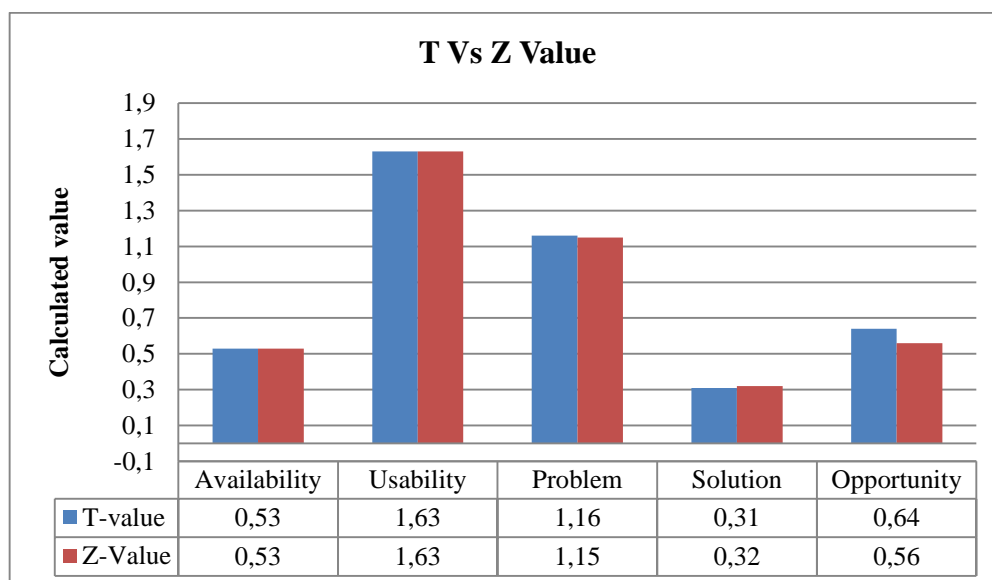


**Figure 4** T Vs z value of ICT factors

Figure 4 reflects there is no significant difference between results of calculated values of T-test and Z test for five ICT factors. It is revealed that University affiliation status did not affect the attitude of Indian teachers towards ICT availability, usability, problem, solution but in case of opportunity factor, the T- value is found little bit maximum as compared to Z-value.

## CONCLUSION

This paper is written to explore the significant differences between Indian teachers toward ICT in relation to their University's affiliation such as government and private. After successfully applied statistical test we have found no meaningful difference in between response of private University teacher and government University teacher of India. (Meenatchii B., 2015) found a significant difference in the college (higher educational institution) teacher's attitude towards ICT in teaching between the types of institutions and private teacher educators have a greater attitude in using ICT for teaching. Similarly, government teachers differ significantly in ICT literacy from private teachers" of (Mohanty S.P. & Pandua M., 2012) is contradictory to our findings here. Further, an outcome of this study is also against the findings of (Kumar K. & Patil S., 2013) and (Shah S. & Thoker A., 2013). Further, at detail analysis of five ICT factor using

statistical test, we have also concluded that University affiliation did not affect Indian University teachers' attitude. This paper is not only beneficial for future researchers of educational informatics but it also informs European teachers about Indian teachers' attitude towards ICT in the Higher education of India.

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