

An Analytical Approach to Investigate State Diversity towards ICT: A Study of Six Universities of Punjab and Haryana

Chaman Verma^{1*}, Deepak Kumar¹ and Sanjay Dahiya²

¹JJT University, Jhunjhunu - 333001, Rajasthan, India; chaman.verma@gmail.com, contact_to_mehta@yahoo.co.in

²Department of CSE, Ch. Devi Lal State Institute of Engineering and Technology, Panniwala Mota, Sirsa – 125077, Haryana, India; sanjaydahiyakkr@gmail.com

Abstract

Objectives: To explore the opinion towards the awareness of information and communication technology related to State-wise Institutions. **Methods/Analysis:** This study uses student T-test with equal variance to discover out meaningful diversity between faculty and students in relation to their state of residence. A stratified random sampling method is used to collect five hundred sixty samples of students and three hundred forty four samples of faculty from six Universities of Punjab and Haryana. In this paper four Independent and thirty five dependant variables have been considered. Item analysis test has been used to selection of dependant variables. **Findings:** This study explores the ICT awareness between student and faculty of Punjab and Haryana states. The outcome of this study reveals no meaningful difference among students- faculty in relation to their state of residence. There is no diversity found in between Punjab's student and Haryana's student towards ICT awareness. Similarly there is no diversity found between Punjab's faculty and Haryana's faculty about ICT awareness for state variable. **Conclusion/Application:** Evaluating state diversity towards ICT would be prove beneficial and supportive lead to state government administration and other organizations such as UGC, AICTE, DEC, MHRD to realize the current scenario of ICT awareness in Indian Institutions.

Keywords: Degree of Freedom, Diversity, State, T-Test

1. Introduction

There are a variety of ICT tools available in market which can be utilized for the knowledge formation and distributions over the globe. These tools include Fax, Radio- FM (Frequency Modulation), Television, Internet, Mobile phone, Printer, Scanner, Computer, laptop, tablets and many more hardware and software applications. All these devices can be used in imparting in learning, teaching and training for teachers and students. ICT have been used in various activities. It is also said that 96.82% persons are using electronic journals in university library and 93.65% involvement of them is visible to e-mail access for sending and receiving files. Then after 87.30% found to search and gather work using Internet. Many of them (80.95%)

are interested in internet surfing; 76.19%, are using ICT tools for preparing their manuscripts for research proposals and papers; 71.43% persons use ICT for online database storage. Many on them found (69.84%) for making power point presentations and other documents; followed by 55.55% for blogging, Web OPAC (Open public access), discussion forums and career development¹. ICT is not only the backbone of the information society, but is also presented as an important catalyst for inducing educational reforms that change our students into productive knowledge workers². ICT plays a major role to covers a broad continuum of higher educational tools and approaches that continues to grow to meet the needs of students and educators. With the global communication and internet connection speed, web content has grown

*Author for correspondence

richer and more interactive for users³. In² investigated five Nigerian Universities found that Architectural educators lack of ICT resources into their teaching and research environment specifically in providing to architectural industry graduates. ICT expenditure has been selected as having meaningful influence in limiting or lacking of ICT adaption in teaching and research process. They have also discovered few aspects such as attitudes of staff to ICT deployment in Architectural education, computer illiteracy among staff, insufficient and unproductive telecommunication network and insufficient relevant software in order to ICT adaption in Agriculture teaching-learning and research environment. In⁴⁻⁶ stated that In addition, attributes used to assess the attitudes towards ICT of students, teachers and principals have been categorized in two groups: demographics (age and gender) and computer experience (training, years of using computer, ownership of computer, access to a computer, intensity of computer use. In⁷ had showed that in general, both the pre-service teachers and instructors are in favour of using technology in and out-of-class activities. This positive attitude is an important indicator of willingness and first step in effective integration. Almost all of the academic staff was willing and ready to participate in any course, seminar, and workshop about technology usage, which reveals the need for professional development. In⁸ found that no difference between being a male or a female as regard to the attitude toward ICT among teaching staff in Egyptians HEI. In⁹ proved that attitude towards internet does not differentiate meaningfully in terms of gender and grade variables but there is a meaningful difference of opinions in terms of the field of study variable. In¹⁰ revealed that no significant differences between ICT attitudes of Turkish science teachers in terms of gender. Male and female science teachers have the same attitude. It is also found the statistically significant difference between teachers' age and attitudes. In¹¹ explored discussion on the challenges of integrating ICT into the curriculum to achieve sustainable development. In conclusion, the ultimate aim of ICT adoption now is to facilitate effective transformation of learning. In¹² revealed that ICT policy for TVE higher institutions in Nigeria is a switch regulating and controlling the application and activities on the use of ICT. The important of sound policy provisions is clearly shown in this research based on the position of policy makers, administrators and lecturers of such institutions. In¹³ examined the relationship between cash holding and characteristics of ICT firm. This study stated

that level of cash holdings firms is affected by not only its capital structure but also industry characteristics. In¹⁴ concluded that a country that is most visited by typhoons does not affect the economic development relative to Information and Communication Technology (ICT) products and services.

In¹⁵ concluded that higher number of respondents shown their interest towards playing Mario in motion detection game using ICT rather than traditional game. In¹⁶ revealed that the construction of infrastructure does not necessarily ensure an increase in total ICT in the index value. When early childhood teacher had a high ability to use ICT in education they used ICT for their profession more frequently and felt a higher satisfaction with using ICT in education. In¹⁷ showed that the ICT professional growth of secondary school teachers in Tabriz has positive correlation with the correlation coefficient of 0/66 and in significant level of 000/0. Regression analysis showed that IT element predictive professional development of teachers.

2. Objectives and Hypothesis

This study is carried out in order to analysis ICT Awareness among students and faculty members are evolving in higher education system of India. This paper is exploring no meaningful state wise diversity in between students-faculty towards ICT awareness. We have framed the following objectives and their corresponding null hypotheses:-

- To explore state diversity towards Information and communication technology Awareness between Punjab and Haryana students.
- To explore state diversity towards Information and communication technology Awareness between Punjab and Haryana Faculty.

In order to accomplish the mentioned objectives, we have set the two null hypotheses:

H01: There is no meaningful diversity between Punjab's student and Haryana's student towards ICT Awareness in relation to state.

H02: There is no meaningful diversity between Punjab's faculty and Haryana's faculty towards ICT Awareness in relation to state.

3. Data Collection and Sampling

A well defined structured questionnaire is framed to collect primary data using stratified random sampling method. The questionnaire is consisted of thirty five items (questions or dependant variables). The five point Likert scale is used. Item Analysis test has been performed on instrument for selection of questions or variables. Out of total seventy variables, only 50% variables are passed under Item analysis test. Table 1 shows the description of all passed (35) and failed to accept (35) independent variables. Item analysis test is found twenty six variables have VG status and no need for updating further as the Discriminating Power (DP) lies in between the range of 0.40-0.9. There are nine variables are found with G status for DP 0.30-0.39, requires little bit modification; the thirty five variables are found with P status for $DP < 0.19$. Hence, these variables are rejected here due to difficulty value (DV) is less than 0.20.

A normative survey method is used to gather primary data (904 samples of faculty and students). In order to evaluate the assumed null hypotheses t-test at 5% confidence level is applied using data analysis tool in MS- Excel. Each respondent have taken approximately 20 to 30 minutes to filled-up the questionnaires. This research includes the 4 independent and 35 five dependant variables. Table 2 displays the name of four independent variables used in study.

Table 1. Item Analysis Test

Status	N	Value of DV-DP
No. of Accepted variables	35	$DV > 0.20 < 0.75$
No. of Rejected variables	35	$DV < 0.20$
Very Good (VG)	26	$0.9 > DP > .40$
Good (G)	09	$0.39 > DP > 0.3$
Poor (P)	35	$DP < 0.19$

(Source: Authors)

Table 2. Independents Variables

S.No.	Name of Independent Variable
1	Punjab Student
2	Haryana Student
3	Punjab Faculty
4	Haryana Faculty

(Source: Authors)

The total size of samples is 904 and sample space area is limited to 6 Universities located in Haryana and Punjab. Table 3 shows that there are 560 (62%) students and 344 (38%) faculty members are participated in this research study. Out of total 560 students 282 (50.4%) and 278 (49.6%) were belongs to Punjab and Haryana states respectively.

Similarly out of total 344 faculty members 184 (53.5%) and 160 (46.5%) were belongs to Punjab and Haryana States respectively. All the participants are doing study in either private or government universities from two states. They are belonging to various domains such as engineering, arts, law and sciences.

The above Figure 1 shows the four independents variables contains population under each. The variable Punjab student contains 282 (50.4%) boys and girls; the variable Haryana student contains 278 (49.6%) boys and girls; the variable Punjab faculty have 184 (53.5%) including male and female; the Haryana faculty has 160 (46.5%) including male and female faculty. The total number of students and faculty from two states is 904.

4. Data Analysis

In order to evaluate our framed two null hypotheses, t-test at 5% confidence level is used with few descriptive statistics such as mean and standard deviation. The

Table 3. State Wise Distributions of Participants

State	Punjab Student	Haryana student	Punjab Faculty	Haryana Faculty	Total
N	282	278	184	160	904
Total	560		344		904
%	50.4	49.6	53.5	46.5	100

(Source: Authors)

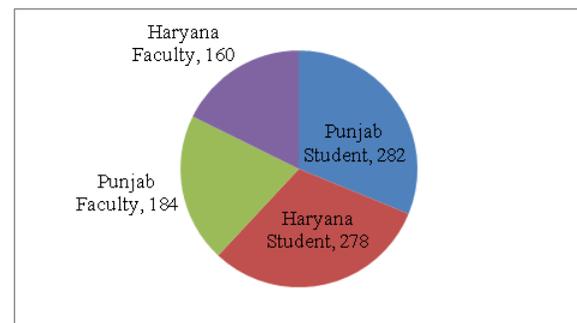


Figure 1. Population Percentage, (Source: Author).

data analysis tool named VBA –tool pack is installed in MS-Excel is used appropriately.

4.1 Evaluation of Hypothesis H01

After applying t-test at 5% level of confidence, we found that calculated t-value 0.36 is lesser than the table t-value 2.0 at 5% level of confidence with 68 degree of freedom ($0.36 < 2.0$ at $df = 68$ at 5%). Therefore, it is not meaningful at 5% level. Hence, our first hypothesis H01 “There is no meaningful diversity between Punjab’s student and Haryana’s student towards ICT Awareness in relation to state” is failed to reject here. It reflects that residence state didn’t affect state diversity for students towards ICT. There is no significant diversity between students of two states towards Information and communication technology awareness.

From Table 5 It is found that there is no meaningful difference between Punjab’s student and Haryana’s student towards ICT. The mean value of Haryana’s students is slightly greater than mean score of Punjab’s student showing little bit more awareness level among Haryana’s student as compared to Punjab’s student.

4.2 Evaluation of Hypothesis H02

Here we discovered that table t-value 2.0 is found to be greater than the calculated t-value 0.3 at 5% level of confidence with 68 df ($2.0 > 0.3$ with $df = 68$ at 5%). It is not significant at 5% level. Hence our second hypothesis H02 “There is no meaningful diversity between Punjab’s faculty and Haryana’s faculty towards ICT Awareness in relation to state” is failed to reject here. Thus, we are not found any meaningful difference between two state’s faculty towards ICT.

The data from Table 6 infers that there is no meaningful diversity between Punjab’s faculty and Haryana’s

Table 5. Punjab-Haryana Student ICT Awareness Analysis

	Punjab Student	Haryana Student
Mean	3.59	3.63
Standard Deviation	0.38	0.44
Variance	0.15	0.19
Calculated t-Value	0.36	
Table- t value	2.0	

*Degree of freedom (df)=68, (Source: Authors)

Table 6. Punjab-Haryana Faculty ICT Awareness Analysis

	Punjab Faculty	Haryana Faculty
Mean	3.86	3.85
Standard Deviation	0.21	0.26
Variance	0.04	0.07
Calculated t-Value	0.3	
Table- t value	2.0	

*Degree of freedom (df)=68, (Source: Authors)

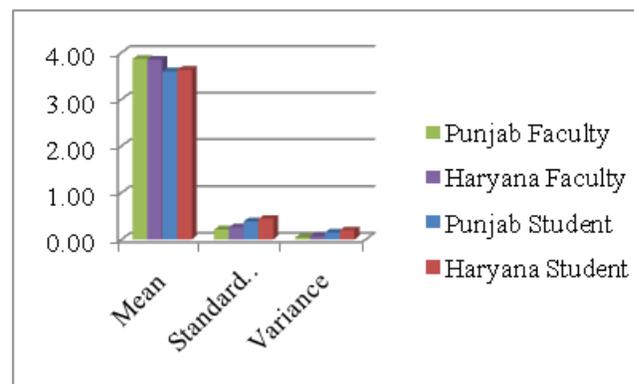


Figure 2. Two State Diversity between Student-Faculty (Source: Author).

faculty about ICT. The mean value of Haryana’s faculty is slightly lesser than the mean score of Punjab’s faculty.

Figure 2 is displaying mean, standard deviation and variance scores of both students and faculty of two states. It shows no meaningful diversity among stakeholders (students-faculty) towards ICT awareness in relation to residence state. It is also apparent from the above Figure 2 that mean values are deviating less from standard deviations for both faculty and students of Punjab and Haryana. Hence, their responses lie in between range of “Agree to strongly agree” sub-scale. It is observed that no significant diversity between two states towards ICT awareness.

5. Conclusion

The main focus on this paper is to evaluate the state diversity for their students and faculty towards Information and communication technology awareness. The outcomes of this study show that there is no consequential diversity between student and faculty towards Information and communication technology awareness in relation to their state

of residence. The residency of stakeholder does not make impact on diversity. The state variable didn't influence the thoughts or opinions of educators and students towards ICT. Therefore, it is revealed that there is no considerable diversity between Punjab's student and Haryana's student about Information and communication technology awareness. It is also explored that there is no important variation between Punjab's faculty and Haryana's faculty about Information and communication technology awareness. This research is not only beneficial for future researchers of ICT, but also it provides the present scenario of ICT in Indian Higher educational institutions.

6. Acknowledgement

The authors would like to thank all participants and administration of Institutions under study for providing their valuable time, precious views in order to completion of this research. The author would like to thank Dr. Sanjay Dahiya for his authentic support and precious supervision during course of this work.

7. References

1. Siddiqui J. Usage of ICT products and services by faculty members and research scholars of Shobhit University, Meerut, India. *International Journal of Library and Information Science*. 2013; 5(10):362–69.
2. Pelgrum W. Obstacles to the integration of ICT in education: results from a worldwide educational assessment, *Computers and Education*. 2001; 37(2):163–78.
3. Aixia D, Wang D. Influencing Learner Attitudes Toward E-learning and Development of E-learning Environment Based on the Integrated E-learning Platform, *International Journal of e-Education, e-Business, e-Management and e-Learning*. 2011; 1(3):264–68.
4. Chukwunonso F, Oguike MC. An Evaluation Framework for New ICTs Adoption in Architectural Education. *International Journal of Informatics and Communication Technology*. 2013; 2(3):183–89.
5. Jimoyiannis A, Komis V. Examining teachers' beliefs about ICT in education: Implications of a teacher preparation programme *Teacher Development*. 2007; 11(2):149–73.
6. Papaioannou P, Charalambous K. Principals' attitudes towards ICT and their perceptions about the factors that facilitate or inhibit ICT integration in primary schools of Cyprus. *Journal of Information Technology Education*. 2011; 10:349–69.
7. Wen JR, Shih WL. Exploring the information literacy competence standards for elementary and high school teachers. *Computers and Education*. 2008; 50(3):787–806.
8. Gulbahar Y. ICT usage in Higher Education: A case study on pre-service teachers and instructors. *The Turkish Online Journal*. 2008; 7(1):1–6.
9. Elsaadani M. Teaching Staff' Attitude Toward ICT: Is Gender A Factor. 2012, *International Women Online Journal of Distance Education*. 2012; 1(2):21–30.
10. Tuncer M, Dogan Y, Tanas R. Vocational School Students' Attitudes Towards Internet. *Social and Behavioral Sciences*. 2013 Nov 26; 103:1303–08.
11. Tella A, Olusola Adu E. Information Communication Technology (ICT) and curriculum development: the challenges for education for sustainable development. *Indian Journal of Science and Technology*. 2009; 2(3):55–9.
12. Shuaibu B, Saud M, Bello H, Kamin Y, Buntat Y. Modelling the Determinants of ICTs Policy Formulation in Technical and Vocational Education in Nigerian Institution of Higher learning. *Indian Journal of Science and Technology*. 2013; 2(3):4273–81.
13. Chon M, Choi J. An Analysis of Cash Holdings of ICT frms. *Indian Journal of Science and Technology*. 2015; 8(S1):412–19.
14. Caluza B. Challenges of Typhoons in ICT: Is it a Risk to Economy. *Indian Journal of Science and Technology*. 2015; 8(10):958–62.
15. Kannan M, Geetha M, Sujatha J. An Analysis between Traditional and Motion Detection Game – using ICT Techniques. *Indian Journal of Science and Technology*. 2014; 7(12):1956–62.
16. Kim S. Analysis of Early Childhood Teachers' Level of ICT Competency. *Indian Journal of Science and Technology*. 2015; 8(21):1956–62.
17. Badri M, Mousavi T, Reza M, Gervand I, Yeganeh A. Examine the Relationship between use of the ICT and Professional Development of Secondary School Teachers in Tabriz. *Indian Journal of Science and Technology*. 2015; 8(12):1–5.