

A Distributed Cognitive Approach Towards Internet Communication using F-Test

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ABSTRACT -Internet is supposed to be a powerful multi-purpose tool for information searching. A number of people of different ages; from teenagers to old persons use it for sharing ideas, knowledge, experiences, cultures and communication. Internet has brought technological advancement in academics where the mode and medium of studies and research have almost changed. The faculty and students use more of internet than any other source for their teaching and studies purpose. The aim of this paper is to statistically test the significant difference between thoughts of faculty towards internet usage using F-Test. The research is conducted using a structured questionnaire according to five Point Likert-scales. More than hundred samples have been collected from six different reputed institutions including both male and female faculty in Sirsa District. By Applying F-Test on the samples reveals the scatteredness in thoughts of male faculty and female faculty towards the use of internet in their social, academic and personal lives.

Keywords: -F-test, mean, scatteredness, variance.

I. INTRODUCTION AND RELATED WORK

A report generated by Internet Society this year, tells that there are more than 3 billion people online today. The increasing use of smart phones, tablets in our day to day life has lead to adoption of internet at a faster rate [1]. According to another report released by the Internet and Mobile Association India (IAMAI) and IMRB International, India will have 402 million Internet users by December,2015; the second-largest Internet user base in the world [2]. A case study of the University of Kashmir by Tawfeeq Nazir reveals that majority of research scholars and students of science faculty are aware of e-journals, e-mails, e-maps, e-newspapers as compared to social science faculty. Users of Science faculty find e-resources as time saving and extra informative[3].A study conducted in Zimbabwean University academics tells that there is access to computers and the internet mainly from their university offices. An average of four hours per day is spending on internet for the academic purposes. University academics use Internet to write research papers, to prepare lectures and to update their main subject knowledge base [4]. A study in Barak Valley, South Assam showed that Internet is greatly used by college library users for their academic, classroom teaching, assignments and research[5].A study done in engineering colleges of Punjab, Haryana and Himachal Pradesh reveals that use of internet facility has enabled teachers to enhance their academic excellence by providing latest worldwide information [6].

The investigation done in institutions of Saudi Arabia has marked that faculty member's attitude is positive towards internet usage; internet adoption has been increased and readily used and accepted by faculty for academic purposes [7]. Aydin, D'Esposito and Gardner concluded that studies indicate that internet makes life easy and connects different communities and cultures[8,9].To measure the thoughts of faculty regarding Internet usage, F-Test which is a statistical test is found to be appropriate. Statistical variance shows the way to compute the scatteredness in data and helps to determine the attitude of users involved in the analysis. F-Test is the popular frequency test introduced to test the frequency distribution of any given data items in sample. F-Test is used to compare the variance of two populations. If calculated (F) value>observed value (F critical one-tail), then we reject the null hypothesis otherwise accept. Paul J. Lavrakas described that an F-Test is any statistical hypothesis test whose test statistic assumes an F probability distribution. F-test is frequently associated with analysis of variance (ANOVA) and is most commonly used to test the null hypothesis. The F-test was devised as an extension to the Z-test but F-test has a distinct advantage over the Z-test because multiple independent groups can easily be compared [10]. Chaman Verma and Sanjay Dahiya concluded found statistically significant difference in scatteredness in student's thought regarding usage of Internet in relation to

gender basis and locality basis [11]. Murat TUNCERa, Yunus D O ANb, Ramazan TANA c described that the use of Internet for education and research is very essential. Internet is used in teaching, research, social interaction, communication and exchange of information [12].

II. OBJECTIVES AND HYPOTHESIS

This study sought to discover variances of faculty’s attitude towards Internet Usage in various educational institutions of Sirsa district, Haryana.

1. To discover out the scatteredness in faculty’s thoughts regarding Internet usage on gender basis.
2. To achieve the above objective null hypothesis is described below:

H01: There is no significant difference in difference between scatteredness in faculty’s thoughts regarding Internet in relation to their gender.

III. DESIGN AND METHODOLOGY

A questionnaire is prepared according to Psychometric Likert type scale which is distributed amongst male and female faculty of different colleges and universities in Sirsa district, Haryana. A stratified random sampling method is used to collect the samples. A structured Questionnaire is designed as per the objective keeping in mind that faculty’s thoughts are to be analysed in the study, regarding internet usage in their social, academic and personal lives.

3.1 VARIABLE SELECTION

The present study includes one independent and twenty dependent variables. In this paper Gender is considered as independent variable and dependent variables are chosen according to social, personal and academic outlook of faculty.

3.2 INSTRUMENT DESIGN

In the present study, a questionnaire is designed to find out variances in faculty’s thoughts towards Internet usage in academics, social and their personal lives. IAS (Internet attitude scale) is used in 5 point Likert format. This instrument consisted of 20- items scored on a 5 point Likert type scale (strongly disagree=1, disagree=2, undecided=3, agree=4, and strongly agree=5).

3.3 POPULATION IDENTIFICATION

The faculty members are from different fields. Table 2 shows that there are 52.6% male and 47.4% female faculty. Table 3 shows that 48.2% are from arts field and 51.8% are from science field. Table 4 gives graphical representation of institute wise distributions of participants. There is one university and rest other are colleges. There are 26.3% of participants from CDLU(Ch. Devi Lal University), 15.8% of them from GNC(govt. National college),7% from LHP(Hansraj Phutela Law College), 19.3% from JCDM(JCD Memorial College),22.8% from JCDMCOE (JCD Memorial College Of Engineering) and 8.8% from JCDIBM (JCD Institute Of Business Management).

TABLE I. Institute Wise Population Distribution

Participated Institutions							Total
	University	Colleges					
	CDLU	GNC	LHP	JCDM	JCDMCOE	JCD IBM	
N	30	18	8	22	26	10	114
%	26.3	15.8	7	19.3	22.8	8.8	100

(Source: Authors)

3.4 SAMPLING

The study uses stratified random sampling method is used to collect primary data. A total of 114 faculty members from different institutions of Sirsa district, Haryana have participated in the study.

3.5 STATISTICAL TECHNIQUES

To find out the variances in thoughts of faculty towards Internet usage frequency test (F-test) is applied. To determine significant difference among faculty outlook in relation to their gender, independent sample Faculty f-test is applied. In present study the analysis of faculty filled score is done by adding tool packs in Microsoft Ms-Excel 2010 named as Analysis Toolpack and Analysis Toolpack-VBA. Various tables were made using different functions like count (), average () and stdev().

IV. DATA ANALYSIS

4.1 GENDER WISE OUTLOOK ANALYSIS:

In this section results have been found regarding evaluate outlook of faculty in relation to their gender. Faculty Outlook towards Internet awareness has been compared in terms of gender. The results of the independent group's t-test which compares the faculty outlook towards Internet awareness in relation of gender variable have been given in Table-3.

TABLE II. Individual Variables Testing Using F-Test

Attributes	Dependent Variable	Male n=60		Female n=54		Critical fval= 1.56372	Hypothesis Status (Accepted/ Rejected)
		Mean	Sd	Mean	Sd	F-value	
S_{OUT}	1. Internet helps to improve Indian academic growth	4.2	0.732	4.1	0.492	2.21543	Rejected
	2. Internet is good social media.	4.3	0.761	4.1	0.61	1.55844	Accepted
	3. Internet promotes cyber crime	3.7	0.911	4.0	0.858	1.12879	Accepted
	4. Internet is harmful for our educational society	2.0	1.149	2.1	0.96	1.43415	Accepted
A_{OUT}	5. I use Internet to prepare my lecture notes	4.1	0.804	3.9	0.784	1.05419	Accepted
	6. Internet act as digital library of e-books	4.2	0.755	4.2	0.541	1.94729	Rejected
	7. Internet is play a major role as research tool	4.6	0.622	4.6	0.592	1.10400	Accepted
	8. I think Internet is easy to use as compare to Library	4.0	0.688	3.8	1.065	0.41718	Accepted
	9. I motivate my students to learn Internet	4.3	0.537	4.2	0.528	1.03367	Accepted
P_{OUT}	10. Internet is wastage of time and efforts	1.8	0.804	1.8	0.718	1.25489	Accepted
	11. I do not like Internet due lack of knowledge.	1.9	1.005	1.9	0.744	1.82672	Rejected
	12. Internet is great hub of useful Information	4.7	0.454	4.6	0.502	0.82083	Accepted
	13. I think Internet is not easy to learn	2.2	0.963	2.1	0.825	1.36225	Accepted
	14. I forgot time while using Internet	3.4	1.207	3.1	1.139	1.12177	Accepted
	15. I am confident while using Internet	4.2	0.547	4.1	0.516	1.12507	Accepted
	16. I think Internet is best communication media	4.3	0.71	4.0	0.727	0.95391	Accepted
	17. I use Internet in my mobile	4.1	0.999	4.0	0.911	1.20148	Accepted
	18. I think Internet is source of entertainment.	4.1	0.787	3.9	0.529	2.21548	Rejected
	19. I use Internet to read newspaper	3.4	1.025	3.0	1.098	0.87030	Accepted
	20. I use Internet at my home and College/University	4.4	0.673	4.3	0.5	1.81116	Rejected

*(Social Out Look (Sout), Academic Outlook (Aout), and Personal Outlook (Pout))

(Source: Authors)

4.2 GENDER WISE TESTING OF HYPOTHESIS:

Table 2 shows the result of F-test for each dependent variable which is conducted on male and female faculty. The first four dependent variables are part of the attribute S_{OUT} (Social Outlook), next five dependent variables come under A_{OUT} (Academics Outlook) and the remaining is part of P_{OUT} (Personal Outlook).

- Observations: MALE (N=60) and FEMALE(N=54)
- Degree of Freedom: MALE(df=59) and FEMALE(df=53)
- Calculated F values are given in the table..
- F Critical one-tail: Observed F=1.56372

It is revealing from table 3 that for a wide number of variables, hypothesis H01 is accepted. For variables 1st, 6th, 11th, 18th and 20th, the hypothesis is rejected as F>F Critical which is not satisfying the hypothesis. The hypothesis is accepted for the variables numbered as 2nd, 3rd, 4th, 5th, 7th, 8th, 9th, 10th, 12th, 13th, 14th, 15th, 16th, 17th, 19th as value of F<Critical which satisfies the individual hypotheses.

TABLE III. Overall Analysis Using F-Test

Group	Male	Female
Mean	3.68	3.591019
Variance	0.89531	0.825665
Observations	20	20
df	19	19
F	1.08435	
P(F<=f) one-tail	0.430868	
F Critical one-tail	2.168252	

- Observations: Male (N=60) and Female (N=54).
- Degrees of Freedom: Male (df=59) and Female (df=53).
- F : Calculated F=1.0236
- P: probability that the observed difference in variance between male and female results from random error.
- If P < 0.05, variances are statistically different. Here it is 0.430868.
- F Critical one-tail: Observed F=2.168252.

Table 3 shows that F < F Critical (1.08435<2.168252) value at 5% level of significance is not significant which satisfies the hypothesis H01 and proves that there is no significant difference between scatteredness in faculty’s thoughts regarding Internet in relation to their gender. Hence null hypothesis H01 “There is no significant difference in difference between scatteredness in faculty’s thoughts regarding Internet in relation to their gender” is failed to reject.

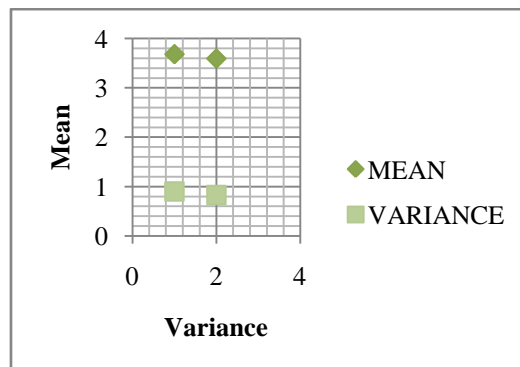


Fig. 1: Distributed Cognitive Model on Gender basis
(Source: Author)

The above Fig. 1 shows scatteredness of mean and variance in relation to gender variable of faculty. The X-axis shows variance value and Y-axis represents mean value for them. The data from above graph evident that no meaningful variation between scatteredness in faculty's thoughts regarding Internet in relation to their gender due to nearby value (mean and variance) of male and female faculty towards Internet. Hence, it reveals gender variable did not affect scatteredness between male and female faculty towards Internet communication. Thus, authors have entitled this study as distributed cognitive approach.

V. CONCLUSION

This study has statistically tested various variables and has given the results accordingly. The results support that Internet is a good social media, helps to prepare lectures, is a good research tool, motivates students and is overall a great hub of useful information. The male and female faculty have responded positively to a great number of variables. They use more of internet in their social, academic and personal lives. The outcomes of this paper are revealing that there is no scatteredness among thoughts of faculty towards Internet usability. Even faculty has also supported some of the variables which showed that internet also promotes cyber crime and is also harmful for our educational society. But more of the acceptance to variables has revealed that their attitude is positive towards Internet usage. The results of this study also give us suggestions that the availability of internet should be increased at educational places and new technologies should be readily adopted as internet is actively being used by faculty for educational purposes. The technologies should be adopted and updated not only in Sirsa district but also in other districts of Haryana district.

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