



INFLUENCE OF PERSONALITY TRAITS ON TECHNOLOGY ADOPTION BY COLLEGE STUDENTS

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Abstract

The small virus covid 19 has changed our life to pro technology in many fields including education. The adoption of technology by college students depends on many factors including personality. The paper aims to study the technology adoption by college students and the five personality factors impacting the adoption. The famous U. T. A. U. T. Model for technology adoption and the TIPI model for personality measurement are used and measured for 332 college students in saurashtra using convenience sampling through a structured questionnaire. The results shown that the adoption of technology in learning is influenced by all personality factors i. e. extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. The demographic analysis shown that gender and geography of residence didn't have any influence on technology adoption by college students but, the faculty of study and family income has influence on the adoption of technology by college students. The other faculty students than the 3 has the most technology adoption, the science students were next, then, commerce and the last were arts students. At a level, increase in monthly income made the students more prone to adopt the technology. The results may be helpful to frame policies and programmes for decision makers in education and useful in further research.

Key words: adoption of technology, UTAUT model, personality traits, TIPI scale, college students, regression model.

INTRODUCTION

The internet has changed the world. Today, (statistica. com, 2020) India has over 687 million internet users out of which majority uses on mobile (629 million). This accounts for roughly 12 % of the world's internet users which is 3.8 billion (inc42.com, 2020). The youngsters are more willing and able to learn, work and entertain themselves on the internet (actforyouth.net, 2020).

Due to covid 19 pandemic, the lockdown is prevailing almost everywhere in the world. Social, religious or educational gatherings are prohibited everywhere including India (wikipedia.org, 2020). Providing education to children was a big issue which was solved by many institutions as to provide online education. Online education including mobile learning (m learning) needs adoption of technology among youth and is a topic of interest for many researchers since last two decades (Kim et al., 2017, Briz-Ponce et al., 2017, Crompton and Burke, 2018, Hamidi and Chavoshi, 2018, Hamidi and Jahanshaheefard, 2019). The adoption of technology is different among different people which may be affected by personality traits. Thus, here the researcher tried to study the relationship of personality traits and technology adoption among youth for online education.

REVIEW OF LITERATURE

Adoption of technology is a topic of researchers for many. The technology acceptance model (T. A. M.) has been widely used model (King and He, 2006, Chauhan and Jaiswal, 2016; Šumak and Šorgo, 2016, Cimperman et al., 2016, Šumak et al., 2017) with few disadvantages (Sánchez-Prieto et al., 2016, Tsai et al., 2018). One more model (Parasuraman, 2000) namely technology readiness

index (T. R. I.) was developed. The model has taken into account the personality factors like optimism, innovativeness, discomfort and insecurity for acceptance of technology. There were so many models developed but a comprehensive and widely used model was developed and named as the unified theory of acceptance and use of technology (U. T. A. U. T.) (Venkatesh, 2003). The model included and covered aspects of many models (Davis et. al., 1989, Venkatesh and Davis, 2000, Taylor and Todd, 1995, Thompson et. al., 1991, Vallerand, 1997, Compeau and Higgins, 1995). A bit modified U. T. A. U. T. model is used here in the research. It was observed (Salarzadeh et. al., 2017) that performance expectancy and hedonic motivation are the strongest factors impacting the intention to use e-learning through Facebook. The social sites can also function as education tool as they enhance and motivate communication among users (Mazman and Usluel, 2010, Ainin et. al., 2015). Terzis et. al. (2012) used big five personality trait model to know the acceptance of computer based assessment. They found the effects of all five traits on the acceptance. During covid 19 era when everybody needs to study online, the adoption of technology by students in India and in higher education and the impact of personality traits on adoption of technology is not in the best knowledge of the researcher. Thus, the research gap led the study.

RESEARCH METHODOLOGY

Research objectives

The research gap of observing the relationship between personality traits and technology adoption leads to following objectives.

1. To observe different personality traits and technology adoption by college students.
2. To study relationship between different personality traits and technology adoption by college students.
3. To compare technology adoption by college students for various groups like gender, geographic area, faculty of studies and family income.

DATA COLLECTION, SAMPLE AND TOOL

In this research, personality measurement is done on the basis of TIPI scale developed by Gosling et. al. in 2003 and the technology adoption measurement is done on the basis of U. T. A. U. T. model developed by Venkatesh in 2003. The U. T. A. U. T. model has scale of 16 questions which are measured on five point likert scale (1 = strongly disagree, 5 = strongly agree) and a bit modified for college students of saurashtra. The TIPI scale for personality development scale has 10 questions measured on five point likert scale. It measures five personality traits i. e. Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience. The data were collected via a structured questionnaire. Out of total 400 questionnaires administered, 332 questionnaires were found valid for analysis which gives a response rate of 83 %. Data were collected from Saurashtra region of Gujarat state of India. Convenience sampling technique is used as sampling technique.

Data analysis

Data collected were analysed majorly through S. P. S. S.. The analytical techniques used here are descriptive analysis, correlation analysis, regression analysis, t test and ANOVA test.

Data Analysis and Discussion

Different techniques for analysis of data are adopted as described below.

Descriptive analysis

For checking the reliability of the data, the Cronbach's Alpha technique is used which is

calculated as 0.785 that directs that the data are reliable (Sun and Zang, 2006). The overall skewness found out from analysis is -0.039 with 0.134 as standard error and kurtosis found out from analysis is -0.305 with 0.267 as standard error. The significance for Shapiro - Wilk test found out from analysis as 0.212 which describes the normal data and permits the use of parametric tests..

The consumer profile is shown in table 1

Table I. Demographic profile of college students

Gender groups.		Geographic region.	
Male.	194	Urban.	169
Female.	138	Rural.	162
Faculty of study.		Family income.	
Arts.	82	Less than 4,00,000.	09
Commerce.	85	4,00,001 – 8,00,000.	136
Science.	84	8,00,001 – 12,00,000.	148
Others.	81	12,00,001 - 16,00,000.	31
		Above 16,00,000.	08

Correlation and regression analysis.

First, the pearson correlation analysis is done for relating technology adoption by college students with five personality traits.

Table II. Pearson correlation analysis for technology adoption by college students with five personality traits

		Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness to experience	Total tech adaption
Extraversion	Pearson Correlation	1	.629**	.496**	.368**	.563**	.651**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	332	332	332	332	332	332
Agreeableness	Pearson Correlation	.629**	1	.733**	.458**	.605**	.614**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	332	332	332	332	332	332
Conscientiousness	Pearson Correlation	.496**	.733**	1	.336**	.470**	.487**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	332	332	332	332	332	332
Emotional stability	Pearson Correlation	.368**	.458**	.336**	1	.685**	.431**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	332	332	332	332	332	332
Openness to experience	Pearson Correlation	.563**	.605**	.470**	.685**	1	.601**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	332	332	332	332	332	332

Total tech adaption	Pearson Correlation	.651**	.614**	.487**	.431**	.601**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	332	332	332	332	332	332

** . Correlation is significant at the 0.01 level (2-tailed).

It is observed from table 2 that technology adoption by college students is related with all five personality dimensions i. e. Extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. Regression analysis is observed as shown in table 3, 4 and 5.

Table III. Regression analysis for technology adoption by college students with personality traits

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730 ^a	.532	.525	5.81829

a. Predictors: (Constant), openness to experience, conscientiousness, extraversion, emotional stability, agreeableness

Table IV. ANOVA for Regression analysis for p technology adoption by college students with personality traits

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12562.482	5	2512.496	74.219	.000 ^b
	Residual	11035.903	326	33.852		
	Total	23598.386	331			

a. Dependent Variable: totaltechadaption

b. Predictors: (Constant), openness to experience, conscientiousness, extraversion, emotional stability, agreeableness

Table V. Coefficients for Regression analysis for technology adoption by college students with personality traits

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.920	1.940		8.720	.000
	extraversion	2.594	.370	.359	7.020	.000
	agreeableness	1.351	.439	.202	3.081	.002
	conscientiousness	.267	.381	.039	.700	.484
	emotional stability	.201	.345	.031	.583	.560
	openness to experience	1.555	.399	.237	3.898	.000

a. Dependent Variable: totaltechadaption

In regression analysis, the F found out is 74.219 and the adjusted R² calculated is 0.525 which confirms that technology adoption by college students is positively related to all five personality traits i. e. Extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. The coefficients are shown in table 6 as above.

Analysis of demographic groups

The t – test for gender wise comparison and one way ANOVA test for age, education and

income wise comparison are calculated which are shown in table 5.

Table V. t test and ANOVA test results

Factors	Gender(t test).	Geographic region (t test).	Faculty of study (ANOVA).	Family income p. a. (ANOVA).
Passion for purchase online.	-0.1056	-0.764	54.658*	97.803*

* = significant at 0.05 significance level.

The t test result for technology adoption by college students for gender and geographic region do not have significant differences. The ANOVA results for different faculty of study and family income have significant differences of technology adoption by college students. For finding the specific group differences post hoc Tuckey test for faculty of study groups and family income groups which are shown in table 7 and table 8.

Table VII.

Multiple comparison for technology adoption by college students. : tuckey HSD for faculty of study groups

Tukey HSD

(I) faculty	(J) faculty	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Arts.	Commlerce	-2.81836*	1.07204	.044	-5.5866	-.0501
	Science	-9.41318*	1.07517	.000	-12.1895	-6.6368
	Others	-12.16230*	1.08496	.000	-14.9639	-9.3607
Commerc e	Arts	2.81836*	1.07204	.044	.0501	5.5866
	Science	-6.59482*	1.06553	.000	-9.3463	-3.8434
	Others	-9.34394*	1.07541	.000	-12.1209	-6.5670
Science	Arts	9.41318*	1.07517	.000	6.6368	12.1895
	Commlerce	6.59482*	1.06553	.000	3.8434	9.3463
	Others	-2.74912	1.07853	.055	-5.5341	.0359
Others	Arts	12.16230*	1.08496	.000	9.3607	14.9639
	Commlerce	9.34394*	1.07541	.000	6.5670	12.1209
	Science	2.74912	1.07853	.055	-.0359	5.5341

*. The mean difference is significant at the 0.05 level.

Table VIII. Multiple comparison for technology adoption by college students. : tuckey HSD for family income groups.

Tukey HSD

(I) income	(J) income	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Less than 4,00,000.	4,00,001 – 8,00,000.	-3.94853	1.97292	.268	-9.3604	1.4633
	8,00,001 – 12,00,000.	-13.79730*	1.96794	.000	-19.1955	-8.3991
	12,00,001 - 16,00,000.	-19.51613*	2.17042	.000	-25.4697	-13.5625
	Above 16,00,000.	-26.00000*	2.78531	.000	-33.6403	-18.3597
	Less than 4,00,000.	3.94853	1.97292	.268	-1.4633	9.3604

4,00,001 – 8,00,000.	8,00,001 – 12,00,000.	-9.84877*	.68089 2	.000	-11.7165	-7.9811
	12,00,001 - 16,00,000.	-15.56760*	1.1408 4	.000	-18.6970	-12.4382
	Above 16,00,000.	-22.05147*	2.0853 6	.000	-27.7718	-16.3312
8,00,001 – 12,00,000.	Less than 4,00,000.	13.79730*	1.9679 4	.000	8.3991	19.1955
	4,00,001 – 8,00,000.	9.84877*	.68089	.000	7.9811	11.7165
	12,00,001 - 16,00,000.	-5.71883*	1.1322 2	.000	-8.8246	-2.6131
12,00,001 - 16,00,000.	Above 16,00,000.	-12.20270*	2.0806 6	.000	-17.9101	-6.4953
	Less than 4,00,000.	19.51613*	2.1704 2	.000	13.5625	25.4697
	4,00,001 – 8,00,000.	15.56760*	1.1408 4	.000	12.4382	18.6970
Above 16,00,000.	8,00,001 – 12,00,000.	5.71883*	1.1322 2	.000	2.6131	8.8246
	Above 16,00,000.	-6.48387*	2.2731 2	.037	-12.7192	-.2486
	Less than 4,00,000.	26.00000*	2.7853 1	.000	18.3597	33.6403
Above 16,00,000.	4,00,001 – 8,00,000.	22.05147*	2.0853 6	.000	16.3312	27.7718
	8,00,001 – 12,00,000.	12.20270*	2.0806 6	.000	6.4953	17.9101
	12,00,001 - 16,00,000.	6.48387*	2.2731 2	.037	.2486	12.7192

*. The mean difference is significant at the 0.05 level.

Above tables show the significant difference of technology adoption by college students among all faculty of study groups. Looking to means, it can be said that other faculty students have the most adoption of technology, then comes the science students, then commerce and then arts faculty students. For income groups, Less than 4,00,000..00 and 4,00,001 – 8,00,000..00 income groups didn't have significant difference of technology adoption while all other income groups have significant differences of technology adoption i. e., 8,00,001 – 12,00,000..00, 12,00,001 - 16,00,000 and above 16,00,000. Looking to the means, it can be said that as income increases, the technology adoption among college students increases.

CONCLUSION

The technology adoption by college students is influenced by all five personality factors i. e. Extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. The dependency of technology adoption by college students is explained by regression analysis. In demographics, gender and geographic region didn't have any impact but faculty of study and family income had an impact on the technology adoption by college students. In the era of covid 19 and post covid 19, we have to adopt technology in education and in almost every field of life. The results help the decision makers or leaders in education to frame policies and programmes to make aware and make used to technology to college students. The research can open new frontiers for further researchers too.

References

- Ainin S., Naqshbandi M. M., Moghavvemi S. and Jaafar N. I., (2015) Facebook usage, socialization and academic performance. Computers & Education. 83, 64 - 73.



- Briz-Ponce, L., Pereira, A., Carvalho, L., Juanes-Méndez, J. A., and García-Peñalvo, F. J. (2017). Learning with mobile technologies–students’ behavior. *Comput. Hum. Behav.* 72, 612 – 620. doi: 10.1016/j.chb.2016.05.027.
- Chauhan, S., and Jaiswal, M. (2016). Determinants of acceptance of ERP software training in business schools: empirical investigation using UTAUT model. *Int. J. Manage. Educ.* 14, 248 – 262. doi: 10.1016/j.ijme.2016.05.005.
- Cimperman, M., Brenčič, M. M., and Trkman, P. (2016). Analyzing older users’ home telehealth services acceptance behavior—applying an extended UTAUT model. *Int. J. Med. Inform.* 90, 22 – 31. doi: 10.1016/j.ijmedinf.2016.03.002.
- Compeau, D. R., and Higgins, C. A. (1995). Computer self-efficacy: development of a measure and initial test. *MIS Q.* 19, 189–211.
- Crompton, H., and Burke, D. (2018). The use of mobile learning in higher education: a systematic review. *Comput. Educ.* 123, 53–64. doi: 10.1016/j.compedu.2018.04.007.
- Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Manag. Sci.* 35, 982 – 1003. doi: 10.1287/mnsc.35.8.982.
- Gosling S. D., Rentfrow P. J. And Swann W. B., Jr. (2003). A very brief measure of the big five personality domains, *Journal of Research in Personality*, 37, 504 - 528.
- Hamidi, H., and Chavoshi, A. (2018). Analysis of the essential factors for the adoption of mobile learning in higher education: a case study of students of the university of technology. *Telematics Inform.* 35, 1053 – 1070. doi: 10.1016/j.tele.2017.09.016.
- Hamidi, H., and Jahanshaheefard, M. (2019). Essential factors for the application of education information system using mobile learning: a case study of students of the university of technology. *Telematics Inform.* 38, 207 – 224. doi: 10.1016/j.tele.2018.10.002.
- <http://actforyouth.net/adolescence/demographics/internet.cfm> (accessed on 11 / 06 / 2020).
- https://en.wikipedia.org/wiki/COVID-19_pandemic_lockdown_in_India (accessed on 11 / 06 / 2020).
- <https://inc42.com/buzz/india-second-in-number-of-internet-users-mary-meeker/> (accessed on 11 / 06 / 2020).
- <https://www.statista.com/topics/2157/internet-usage-in-india/#:~:text=With%20over%20560%20million%20internet,million%20internet%20users%20the%20country.> (accessed on 11 / 06 / 2020).
- Kim, H. J., Lee, J. M., and Rha, J. Y. (2017). Understanding the role of user resistance on mobile learning usage among university students. *Comput. Educ.*, 113, 108 – 118. doi: 10.1016/j.compedu.2017.05.015.
- King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & Management*, 43, 740 - 755. doi:10.1016/j.im.2006.05.003.
- Mazman S. G. and Usluel Y. K. (2010). Modeling educational usage of Facebook. *Computers & Education.* 55 (2), 444 - 453.
- Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2, 307 - 320. doi:10.1177/109467050024001.
- Salarzadeh Jenatabadi, H., Moghavvemi, S., Wan Mohamed Radzi, C. W. J. B., Babashamsi, P., & Arashi, M. (2017). Testing students’ e-learning via Facebook through Bayesian structural equation modeling. *PLoS ONE*, 12(9), 1 – 19. <https://doi.org/10.1371/journal.pone.0182311>
- Sánchez-Prieto, J. C., Olmos-Migueláñez, S., and García-Peñalvo, F. J. (2016). Informal tools in formal contexts: development of a model to assess the acceptance of mobile technologies among teachers. *Comput. Hum. Behav.* 55, 519 – 528. doi: 10.1016/j.chb.2015.07.002.
- Šumak, B., and Šorgo, A. (2016). The acceptance and use of interactive whiteboards among teachers: differences in UTAUT determinants between preand post-adopters. *Comput. Hum. Behav.* 64, 602 – 620. doi:10.1016/j.chb.2016.07.037.



- Šumak, B., Pušnik, M., Heričko, M., and Šorgo, A. (2017). Differences between prospective, existing, and former users of interactive whiteboards on external factors affecting their adoption, usage and abandonment. *Comput. Hum. Behav.* 72, 733 – 756. doi: 10.1016/j.chb.2016.09.006.
- Sun, H., and P. Zhang.(2006). “Causal Relationships Between Perceived Enjoyment and Perceived Ease of Use: An Alternative Approach.” *Journal of the Association of Information Systems* 9 (7), 618 – 645.
- Taylor, S., and Todd, P. A. (1995). Understanding information technology usage: a test of competing models. *Inf. Syst. Res.* 6, 144–176. doi: 10.1287/isre.6.2.144.
- Terzis, V., Moridis, C. N., & Economides, A. A. (2012). How student’s personality traits affect Computer Based Assessment Acceptance: Integrating BFI with CBAAM. *Computers in Human Behavior*, 28 (5), 1985 - 1996. <https://doi.org/10.1016/j.chb.2012.05.019>.
- Thompson, R. L., Higgins, C. A., and Howell, J. M. (1991). Personal computing: toward a conceptual model ofutilization. *MIS Q.* 15, 125–143.
- Tsai, Y.-Y., Chao, C.-M., Lin, H.-M., and Cheng, B.-W. (2018). Nursing staff intentions to continuously use a blended e-learning system from an integrative perspective. *Qual. Quant.* 52, 2495 – 2513. doi: 10.1007/s11135-017-0540-5.
- Vallerand, R. J. (1997). “Toward a hierarchical model of intrinsic and extrinsic motivation,” in *Advances in Experimental Social Psychology*, ed. M. P. Zanna (San Diego, CA: Academic Press), 271–360. doi: 10.1016/s0065-2601(08)60019-2.
- Venkatesh, V., and Davis, F. D. (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Manag. Sci.* 46, 186–204. doi: 10.1287/mnsc.46.2.186.11926.