

## Big-Five Personality Factors and Technology Acceptance among University Students

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This study aims to investigate how university students' personality characteristics affect their acceptance and adoption of mobile learning technologies, shedding light on the interaction between personal traits and technology integration in educational settings. With a sample of 728 participants, this study investigated the impact of personality factors / traits on the technology acceptance and further to see the effect of certain demographic characteristics on technology acceptance. The Mini-IPIP scale with 20 items by Donnellan et al. and the technology acceptance scale of Park et al. was used to tap the responses from the subjects of the study. The findings showed neither gender nor stream of education (arts, science, and commerce) significantly affected participant's technology acceptance. Further findings showed a strong positive correlation between extraversion and perceived usefulness. Accordingly, participants with agreeable traits had a more vital perception of the mobile learning relevance and accessibility of technology for their learning. Additionally, agreeableness showed significant positive correlations with learning relevance and system accessibility. However, conscientiousness and neuroticism did not significantly correlate with any factors related to technology acceptance. Moreover, a significant positive correlation existed between intellect/imagination and attitude and perceived usefulness. Regression analysis revealed that personality characteristics like extraversion, agreeableness, conscientiousness, neuroticism, and intellect/imagination did not significantly affect technology acceptance.

**Keywords:** Big-5 Personality, Technology Acceptance Modal, Gender, Education Stream, University Students

An individual's behaviour, emotions, and cognitive abilities are significantly shaped by ones personality, which is a complicated and multidimensional construct. The Technology Acceptance Model (TAM), on the other hand, is a famous theoretical framework that clarifies how users view and adopt new technologies. The combination of personality and TAM enables a thorough understanding of people's attitudes, actions, and intentions regarding adopting and using technology.

The study is focused on the growing importance of mobile learning in education, which provides students with mobility and accessibility via mobile devices. The acceptance of this technology by the students is essential for successful

implementation of mobile learning procedures and strategies. This study aims to investigate the influence of personality traits on university students' acceptance of mobile learning. Personality traits have been identified as potential factors that influence technology acceptance. Teachers can create more effective mobile learning strategies that are suited to the needs of this particular group by understanding this relationship.

Ali (2019) and Abedini (2020) researched the significant role of digital factors in fostering creativity. They found that there is a weak relationship between personality traits and creativity in virtual students who used ICTs like the internet, wireless networks, and cell phones. Further

extraversion, agreeableness, conscientiousness, and openness to experience, positively influence an individual's creativity and sense of fulfillment in life, whereas neuroticism has the opposite effect. Results suggested that personality traits can influence a person's interest in stress management apps. Notably, people with high neuroticism are more adaptable and likely to use such apps, whereas people with low agreeableness might not be as interested to use according to Ervasti et al. (2019).

The only moderators of the relationship between perceived stress and adjustment were conscientiousness and negative valence. Due to their personalities, students with high levels of these traits were more likely to feel the negative effects of perceived stress on adjusting to university life (Kural & Özyurt, 2021). In most adjustment dimensions, conscientiousness may be advantageous, whereas neuroticism may be a particular weakness. These findings have global ramifications for universities with growing diversity (Papageorgiou & Callaghan, 2018). In order to prepare them for online interaction and collaboration, collaborative technology integration is crucial (Barak, 2018).

Al Kurdi et al. (2020) investigated E-learning's perceived usefulness and usability as it is positively influenced by technical support, social influence, enjoyment, system interactivity, and computer anxiety. The behavioral intention to use e-learning is significantly influenced by perceived usefulness and perceived ease of use. The intention of students to adopt mobile learning is most strongly influenced by perceived usefulness, though personality traits like perceived enjoyment and self-efficacy also matter (Nabipour Sanjebad et al., 2020). Kaushik and Agrawal (2021) found that students exhibited a positive outlook on e-learning, feeling innovative and upbeat about

its application. However, users of the recently introduced online platforms reported feeling uncomfortable.

The main aim of this study is to look into the influential relationship between personality characteristics and willingness to adapt to new technology. The main objective is to assess the distinctive personality traits of the participants using well-established psychological measures, such as the Big-Five Personality trait. The study also aims to evaluate people's attitudes, beliefs, and behaviours in relation to various technological innovations. The research intends to gain profound understanding of the effect of personality on technology acceptance exploring the relationship and discussing the potentially implications for the development and application of future technologies.

### **Objectives**

1. To study the relationship between personality traits and technology acceptance.
2. To study the difference in technology acceptance and personality traits in the context of gender and stream of education.

### **Hypotheses**

1. There would be a significant difference in technology acceptance across the gender of university students.
2. There would be a significant difference among university students based on the stream of education.
3. There would be a significant relationship between personality traits and technology acceptance among university students.
4. There would be a significant influence of personality traits on technology acceptance among university students.

## Method

### Sample

University students from five state universities in Kerala made up the study's sample. After removing outliers, 728 data points from a total of 750 students were examined using SPSS software version 24.

### Tools

*Big Five Inventory (Mini-IPIP)* : The Mini-IPIP 20 item scale, with a 5-point Likert scale developed by Donnellan et al. (2006) and has five personality traits (Big-5) extraversion ( $\alpha = .78$ ), agreeableness ( $\alpha = .67$ ), conscientiousness ( $\alpha = .67$ ), neuroticism ( $\alpha = .76$ ), and intellect/imagination ( $\alpha = .56$ ). The scale has reported high  $\alpha$ , indicating high level of significance.

*Technology acceptance scale* has 26 items with a 7-point Likert scale developed by Park et al (2012) with dimensions like mobile learning self-efficacy, learning relevance, system accessibility, subjective norm, behavioral intention, attitude, perceived usefulness and perceived ease of use with 'á' .90, .88, .81, .86, .91, .84, .89 and .87 respectively.

## Results

Table 1. Gender difference on technology acceptance, gender, mean, standard deviation, and t-test

Variable	Gender	N	Mean	SD	t
Technology acceptance	Female	393	136.6	15.4	1.20 <sup>NS</sup>
	Male	333	135.3	12.4	

$p < 0.05$ , NS = Not significant

From the table, it is understood that group being studied consists of 393 females, with a mean technology acceptance score of 136.6 and a standard deviation of 15.4. The sample also contains 333 men, with a mean score for technology acceptance of 135.3 and a standard deviation of 12.4. The

t-value of 1.20 indicates that there is no statistically significant difference in technology acceptance between genders. Previous study stated that gender has no discernible impact on the relationship between personality and technology acceptance (Sindermann et al., 2020).

Table 2. Educational stream based difference on technology acceptance, Mean, standard deviation and 'F' value

Educational Stream	N	Mean	SD	F
Science	298	136.11	15.38	0.004*
Commerce	243	136.01	13.34	
Arts	185	136.10	13.24	

\* $p < 0.05$

The technology acceptance mean score of the sample based on the stream of their education, viz., Science, Commerce, and Arts along with, standard deviations, and F-values are shown in the table 2. Students from science stream had a mean of 136.11, while Commerce had 136.01, and Arts had 136.10. These three means were extremely close to one another and almost the same. The standard deviation, which ranges from 13.24 to 15.38, is also closer. According to the reported F-value of 0.004, there is no discernible difference between the means of the three groups. This may mean that there is no significant difference in the variables being measured across various academic fields. Student characteristics like gender, level of study, and course of study have no impact on the students perception of how useful or user-friendly Web-Based Learning Environment (Hwa et al., 2016).

Perceived usefulness and extraversion showed a significant positive correlation ( $r = 0.09$ ,  $p < 0.05$ ). A significant positive correlation between agreeableness (A) and learning relevance ( $r = 0.10$ ,  $p < 0.01$ ) and system accessibility ( $r = 0.04$ ,  $p < 0.05$ ) was found.

Table 3: Correlation between dimensions of personality traits and technology acceptance,

Variable	1	2	3	4	5	6	7	8	9	10	11	12	
E	1	-											
A		.13**	-										
C		-.08*	.07	-									
N		-.08*	-.01	-.02	-								
I		.08*	.18**	.02	.03	-							
MLS		-.00	-.03	-.02	-.01	.04	-						
LR		.06	.10**	.05	.01	-.00	.15**	-					
SA		.00	.10**	.04	-.03	.11**	.17**	.15**	-				
SN		.13**	.11**	-.01	.02	.11**	.16**	.25**	.17**	-			
BI		.04	.00	.02	-.03	-.01	.05	.19**	.11**	.10**	-		
AT		.08*	.01	.04	.00	.02	.11**	.20**	.12**	.23**	.11**	-	
PU		.09*	.03	.08*	-.03	.04	.17**	.19**	.10**	.21**	.11**	.28**	-
PEU		.06	.03	.03	.00	-.02	.11**	.24**	.13**	.18**	.14**	.21**	.29**

(E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, I = intellect/ imagination, MLS = mobile learning self-efficacy, LR = learning relevance, SA = system accessibility, SN = subjective norm, BI = behavioural intention, AT = attitude, PU = perceived usefulness, PEU = perceived ease of use). \*\* p < 0.01, \* p < 0.05.

Further, Conscientiousness did not exhibit appreciable correlation with the variables related to technology acceptance. Similarly, Neuroticism failed to show any significant correlations with any of the variables related to technology acceptance. On the other hand, Intellect/Imagination dimensions showed a strong positive correlation with attitude and behavioural intention perceived usefulness (r = 0.10, p < 0.23). Manolika et al. (2022) self-efficacy beliefs played a role in the relationship between agreeableness and perceived usefulness. It should not go unnoticed that personality affects students' perceptions of technology acceptance directly and indirectly.

Table 4. Multiple regressions of associations between personality traits and technology acceptance

Variable	B	95% CI for B		SE B	β	R <sup>2</sup>	Δ R <sup>2</sup>
		LL	UL				
Constant	120.52			4.97			
E	.44	.10	.77	.17	.09		
A	.28	-.07	.63	.18	.05		
C	.27	-.09	.64	.18	.05	.02	.01
N	-.04	-.41	.32	.19	-.00		
I	.22	-.13	.59	.18	.04		

\*= p < 0.05, \*\*= p < 0.01, NS=Not significant

(E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, I = intellect/imagination)

The outcome variable is shown in the table along with the regression coefficients (B), 95% confidence intervals (CI) for B, standard errors (SE B), and standardized coefficients. With regression coefficients of 0.44, 0.28, and 0.27, the results show that extraversion, agreeableness, and conscientiousness have favourable relationships with the outcome variable. The standard coefficients of 0.09, 0.05, and 0.05, indicate that the effect sizes for these variables are minimal. The confidence intervals for these coefficients imply that the actual population values may not be completely accurate. Intellect/imagination displays a positive relationship with the outcome ( $B = 0.22$ ,  $\hat{\alpha} = .04$ ), whereas neuroticism shows a slight negative relationship ( $B = -0.04$ ,  $\hat{\alpha} = -0.00$ ).  $R^2 = 0.02$  for the overall model and  $\Delta R^2 = 0.01$  for the incremental increase due to the addition of the predictor variables, which accounts for a small portion of the variance in the outcome variable. Previous studies showed that some personality traits significantly affect perceived usefulness and perceived ease of use, while the latter significantly affects behavioral intention and tendency to use the smartphone (Özbek et al., 2014).

### Discussion

The result suggests that participant levels of technology acceptance are not significantly influenced by their gender. The results also imply that attitudes and perceptions towards technology are comparable for both men and women. Venkatesh et al. (2000) revealed that males' decisions were more strongly influenced by their attitude towards using the new technology than female decisions were. Women, however, were more strongly influenced by perceived behavioural control and subjective norms. Early usage behaviour was the driving force behind sustained technology use, strengthening the long-lasting impact of early gender-based

assessments of the new technology. These results held true in spite of income, organizational position, level of education, and computer self-efficacy.

According to the results, the findings indicate that no significant variations in the variable being measured between the three educational background groups - Science, Commerce, and Arts. This suggests that the participants represented by these groups, who represent individuals from various academic disciplines, have comparable scores on the variable. The lack of statistically significant differences suggests that the educational background, as represented by these particular disciplines, has little bearing on the studied variable. Systematically creating online courses that are simple to use and concentrating on the features that university students frequently use, online education can be further improved Han and Sa (2022).

Individuals with higher levels of extraversion tend to perceive technology as more beneficial for their learning purposes. Agreeableness tends to perceive greater relevance in the learning material and find the learning system more accessible. Personality trait conscientiousness and neuroticism may not strongly influence individuals' perceptions of technology. Intellect/imagination perceives technology as more useful and holds more positive attitudes toward it. The relationship between training and perceived usefulness is moderated by openness to experience. Further, this study supports the positive interactions between behavior intention, attitude, and perceived usefulness (Li, 2016).

The analysis findings show that there is no significant influence between personality traits and technology acceptance. Gunnvald et al. (2013) found that, Technology Acceptance Model beliefs serve as a mediator between personality and

behavioural intention, both directly and indirectly. Personality can affect technology acceptance beliefs while having no impact on behavioural intention. Extraversion and behavioural intention have significant, favourable relationships, and the technology acceptance beliefs fully mediate this relationship. Emotional stability and behavioural intentions are related, but the technology acceptance beliefs do not play a role in this relationship. Although it has no effect on behavioural intention, openness to experience is significantly and favourably related to perceived ease of use.

### Implication

The research has implications for technology develops university students in a number of areas, including personalized technology design, improving user experience, addressing technology resistance, facilitating psychological profiling for tech adoption predictions, and taking into account ethical issues with personality-based technology applications among students.

### Conclusion

The presence of an insignificant connection between the personality traits of extraversion, agreeableness, conscientiousness, neuroticism, and intellect/imagination and the trait of technological acceptance was not found in the study. These results imply that the influence of these particular variables on people's attitudes and perceptions of technology may not be as great as previously thought. Further study is required to investigate additional variables that can affect technology acceptance and to create more robust models to better comprehends of this phenomenon.

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