Undergraduate Students' Self-Efficacy and Attitudes toward Technology as Predictors of Academic Achievement

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Abstract

The rapid integration of digital technologies in the sphere of higher education has had an essential influence on the process of teaching and learning and imposed new psychological and cognitive requirements on students of universities. Even with the increasing technical infrastructure on the ground, student academic performance is increasingly reliant on internal factors, including their dispositions towards technology use and their self-beliefs on their capability to study. The proposed research aims at exploring the extent to which academic self-efficacy and technology attitudes of undergraduate students have a bearing on academic achievement at the University of Lahore, Pakistan. It is founded on the Self-Efficacy Theory developed by Bandura and Technology Acceptance Model (TAM). Quantitative correlational study was used to collect data on 404 undergraduate students in six academic departments using validated self-report questionnaires. The evaluation of academic success based on cumulative grade point average (CGPA) was used to assess academic performance of students. The multiple regression analysis, independent-samples t-tests, descriptive statistics and Pearson correlation were performed in SPSS (Version 27). Findings showed academic self-efficacy and technology attitudes explained 52% variance in academic attainment. Self-efficacy was the strongest predictor, while females showed higher self-efficacy and more favorable technology attitudes.. The results support the paramount importance of the psychological preparation in the technology-enhanced learning space and emphasize the urgency of the institutional intervention increasing student confidence levels and engagement rates with digital technologies. The present research, policy and practice implications on higher education are discussed.

Key Words

Self-Efficacy, Attitudes Toward Technology, Academic Achievement, Undergraduate Students, Digital Learning, Pakistan

Introduction

The systems of higher education all over the world are experiencing a radical change in the sense that the digital technologies have taken the centre stage in the delivery of instruction, communication in academics and the building of knowledge. University teaching practices have been transformed to include learning management systems, online collaboration tools, virtual classes and artificial intelligence-enhanced platforms. Such

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developments have not only created a wider avenue to information and learning opportunities, they have also changed the state under which students learn, achieve and continue with their academic endeavors.

Digital transformation of higher education is an opportunity and challenge in developing nations like Pakistan. In the past, Pakistani universities were predominantly taught using traditional, face-to-face models of teaching with little integration of educational technology. In the last twenty years, national programs organized by Higher Education Commission (HEC) have stimulated universities to update the curricula, develop digital facilities, and enhance the research-based learning setting. Consequently, technology-based learning has gained more popularity in both state and non-state university institutions.

In spite of these developments, the manner in which students will react to learning environments that are rich in technology is uneven. Though digital tools can be welcomed positively by some students as tools that improve the efficiency and academic performance, others feel anxiety, resistance, or lack of motivation. Such differences imply that access to technology in itself cannot be used to guarantee academic success. Rather, the psychological factors of the students, especially their perceptions towards their academic abilities and their sentiments towards technologies are significant determinants of learning engagements and learning achievements. According to (Venkatesh et al., 2003), attitude towards technology can be referred to as the general affective assessment of using a technological system. There is a positive correlation between positive attitudes and increased acceptance, engagement, and use of digital resources and negative attitudes may lead to avoidance and decreased academic performance. Nevertheless, with the increasing reliance on technology in higher education, there is a need to know how the self-efficacy and technological attitudes of the undergraduate students can contribute concurrently to academic performance. Thus, the current research paper examines the use of these psychological variables as predictors of academic performance of undergraduate students in the University of Lahore.

Self efficacy which refers to the belief of students in their ability to successfully complete academic tasks has always emerged as one of the strongest predictors of learning behaviour and academic achievement. On the same note, technological attitudes determine the readiness and willingness of students to use digital learning tools, interact, and exploit the same. To formulate effective interventions in education in modern universities, it is necessary to understand the interaction of these two constructs to predict academic achievement.

Thus, the given research explores how academic self-efficacy and technology attitude of the undergraduate students can predict academic performance at the University of Lahore, Pakistan. This study will make a contribution by incorporating both psychological and technological thinking to provide empirical based research towards informing theory and practice within the field of higher learning.

Literature Review
Attitudes Toward Technology

Technological feelings are the way that people describe their evaluative judgment, feelings and behavioral inclinations with respect to technological systems. These attitudes also affect the way students perceive, accept, and use digital tools in the learning process in learning environments. Another theory that gives a substantive background on the attitude to technology is the Technology Acceptance Model (TAM), introduced by Davis (1989), which focuses on two main determinants, i.e. perceived usefulness and perceived ease of use.

TAM shows that students tend to positively disposition towards technology when they consider that digital technologies are useful in increasing their learning performance and they are user friendly. Empirical research has continuously shown that positive technology attitude is coupled with enhanced participation in online learning classrooms, motivation, and academic achievement. On the other hand, the negative attitudes, which may be manifested as anxiety, frustration, or skepticism, may decrease the readiness of students to work with digital

resources and restrict the opportunities of the technological integration. Added as well that attitude towards technology can influence the willingness of the students to engage in digital tools learning settings, with the positive attitude to technology being associated with the use of technology, e.g., learning management systems result in better learning outcomes; meanwhile, students with a negative attitude towards technology may achieve poor outcomes (Kim & Lee, 2024)

The belief about technology is influenced by more than just technical ability in higher education; previous experience, institutional resources and design of instruction are also factors. Students that view technology as part and parcel of learning and to be of support will use digital tools in a strategically planned way that helps them to achieve academic success.

Self-Efficacy

One of the psychologically constructs in the educational research that has received the most significant investigation is academic self-efficacy. Based on the Social Cognitive Theory developed by Bandura, self-efficacy is the conviction of people in their ability to organize and implement actions necessary to attain certain goals (Bandura, 1997). In academia, self-efficacy determines the way the students approach their learning activities, handle challenges and persevere when faced with a challenge.

According to psychology, self-efficacy is a conviction that one can carry out necessary actions and generate results for a given task (Wood et al., 2000) Furthermore, according to (Linnenbrink & Pintrich, 2003) and (Mashhady et al., 2015), people with poor self-confidence in certain areas may internalize a conviction that they lack the abilities and traits needed to attain mastery experience in their own activities.

Bandura (1997) identified four primary sources of self-efficacy: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states. Students who experience academic success, observe peers succeed, receive encouragement, and manage stress effectively are more likely to develop strong self-efficacy beliefs. High academic self-efficacy has been linked to greater intrinsic motivation, deeper learning strategies, effective self-regulation, and higher academic achievement.

Meta-analytic and systematic review studies consistently confirm the strong relationship between academic self-efficacy and academic performance across educational levels and disciplines (Honicke & Broadbent, 2016) .

Academic Achievement

Academic achievement refers to learners' demonstrated level of academic performance, commonly measured through grades, examination scores, or cumulative grade point average (CGPA) (Balkis, 2013; Rodríguez-Fernández et al., 2018). Academic achievement is an important measure of learning outcomes, academic progression, and career opportunities of the students in higher education.

Though cognitive ability plays a part in academic performance the non-cognitive variables like motivation, self-efficacy, and attitudes are playing an increased role to explain variances in achievement. Modern studies in education stress that psychological preparedness and learning ideologies are critical factors of academic achievement especially in complex, technology-mediated learning.

Relationship Between Self-Efficacy and Attitudes Toward Technology

Self-efficacy and attitudes toward technology are two different psychological forces that determine how individuals succeed academically in their day-to-day life and they are conceptually and empirically interconnected. Aziz et al. (2024) went ahead and stated that Students who feel confident in their academic abilities are more likely to approach technology as a supportive learning tool rather than a source of difficulty. Similarly, positive experiences

with technology can strengthen students' sense of competence, reinforcing self-efficacy beliefs (Bandura, 1997; Schunk & DiBenedetto, 2021). Empirical research based on structural equation modeling showed that attitudes towards technology is a powerful predictor of self-efficacy, which in turn is also a powerful predictor of academic performance (Zhao et al., 2025) reported that students who combined both positive attitude towards technology and self-efficacy were able to balance digital tools in order to achieve in academics.

Research suggests that technology attitudes may influence academic achievement both directly and indirectly through self-efficacy. Students who perceive technology as useful and manageable are more inclined to engage with digital learning platforms, leading to increased mastery experiences and improved academic confidence.

The Psychological Factors predictive role of Academic Achievement also contributes to the ever growing literature of fact that academic self-efficacy is among the most significant predictors of academic achievement, even more than the conventional predictors of academic achievement, including previous performance. Nevertheless, Attitudes toward technology do add value to achievement in learning environments rich with technology, even though their effects are frequently overshadowed by self-efficacy.

A concomitant study of the two constructs will give a more holistic picture of academic success in contemporary higher education settings.

Statement of the Problem

Technology has been significantly incorporated in the modern teaching and learning in the various forms of online lectures, digital textbooks, learning management systems, and online collaboration tools. Most of the undergraduate students use these technologies on a regular basis but their experiences are varied. Some students feel secure and at ease whereas some get anxious, experience difficulty, or even avoidance. The differences in the relationship of the students to the technology can have a tremendous impact on the academic performance. Self-efficacy is one of the main psychological elements that can influence this relationship as well as an attitude to technology by students such as their comfort, motivation, and interest in utilizing technology to learn. More confident students who have a positive attitude towards technology will be more successful in using digital resources and attaining superior academic results compared to less confident or those who are not positively oriented and as a result cannot use the same tools as successfully. Nevertheless, the full scope of the prediction that self-efficacy and attitudes towards technology have on the performance of undergraduate students is not adequately known. Thus, the paper has to explore the relationship between self-efficacy and technology attitudes and the future academic performance in undergraduate students.

Significance of the Study

This research paper will look at the way in which self-efficacy and technology attitude are predictive of academic performance among undergraduate students. With the increased application of technology in the higher learning techno-sphere, students vary widely in regard to their level of expertise in the utilization of digital learning resources, even though access to them is equal. Such variations can be typically influenced by psychological factors including the confidence in abilities (self-efficacy) and attitudes towards technology. These factors are important to understand hence improving academic achievement in contemporary learning settings.

By addressing the element of self-efficacy in students with regard to utilizing technology in executing major academic tasks like research work, problem solving, and communication, the study exposes the importance of confidence in students handling technology as a medium to achieving their academic goals. Simultaneously, the analysis of the attitudes to technology assists in interpreting the way in which the beliefs and motivation of students, as well as their desire to utilize digital tools, are connected to their study performance.

The results will add empirical support to the literature on the topic as they will shed more light on the interaction of psychological and attitudinal issues with the use of technology to contribute to undergraduate academic success. In practice, the research highlights the necessity of the higher education institutions to go beyond providing technological access and supporting the instructional strategies and interventions that promote the development of positive attitudes and the increase of self-efficacy. This way, the paper will fill the gap between the availability of technology and actual academic success, and it will focus on the fact that the beliefs and attitudes of students are at the core of successful learning in online and digital learning.

Research questions

1) How does the combination of self-efficacy, attitude towards technology, and academic achievement affect the undergraduate students?
2) What is the role of attitude towards technology in determining the academic performance of the undergraduate students?
3) What is the extent to which self-efficacy influences academic performance of undergraduate students?
4) What is the attitude to technology among the undergraduate students?
5) How self-efficacious are the undergraduate students?
6) Do the undergraduate students differ in their self-efficacy and attitude towards the use of technology significantly, depending on gender, semester, and degree program?

Sampling Framework

The sampling model of this research was developed in such a way that the representation of undergraduate students in various academic fields within the University of Lahore was adequate. The quantitative correlational design was used and the sample size was chosen through a convenience sampling method, which is widely applied in research involving education whereby the clearly defined population can be accessed.

The population of the target was all students in the undergraduate studies at the University of Lahore at the time of data collection. The population made available consisted of students studying six academic departments, which were Pharmacy, Clinical Pharmacy, Physical Therapy, Education, Islamic Studies as well as Nutrition and Dietetics.

There were 404 undergraduate students who took part in the research. This sample size was deemed to be adequate to analyze multiple regression as well as adequate statistical strength to identify significant associations between the study variables.

Engagement was not forced and ethical issues like informed consent, confidentiality and anonymity were well upheld in the data collection procedure.

Theoretical Framework
Bandura's Self-Efficacy Theory

This study is mostly based on the Self-Efficacy Theory of Bandura (Bandura, 1977, 1997). According to the theory, beliefs that people hold about what they are able to do also play a big role in motivating them, in their persistence, in their emotional reactions, and outcomes of performance. Academically, students who have high self efficacy tend to have significant goals, good learning strategies and they will never give up due to academic challenges.

Self efficacy is of great importance in technology enhanced learning environments where students are required to work in both academic and digital environments. One needs to have confidence in their capability to handle these demands in order to succeed academically.
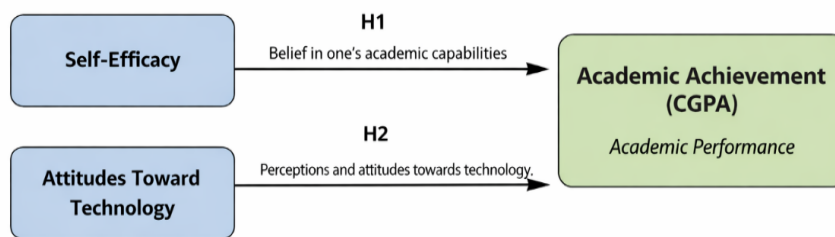
Technology Acceptance Model (TAM)

In order to balance the psychological contribution of self-efficacy, this research is based on the Technology Acceptance Model (Davis, 1989). TAM is based on perceived usefulness and perceived ease of use that determines the attitude of individuals towards technology. The positive attitudes enhance the possibility of using technology, and thus, this affects the learning involvement and learning outcomes.

This research assumes that both psychological confidence and technological perceptions are the determinants of academic achievement but incorporates Self-Efficacy Theory and TAM to conceptualize the relationship.

Conceptual Framework
Figure 1
Conceptual Framework

The assumption is based on both psychological and technology acceptance theories where it is believed that internal beliefs and perceptions of students play a major role in determining their academic performance in technology-enhanced learning conditions.

Self-efficacy and technology attitude are considered as independent variables in this study and academic achievement, in this case, is the dependent variable in terms of cumulative grade point average (CGPA). Academic self-efficacy indicates the levels of confidence in students who think that they can achieve academic tasks successfully, and attitudes towards technology indicate the emotional and cognitive judgment of students on whether to use digital tools to fulfill their learning intentions.

The framework presupposes that the increased self-efficacy rates help students to become more persist and strategic in addressing academic activities, whereas the positive attitude toward technology promotes the successful utilisation of digital learning opportunities. Combined, these aspects are likely to improve academic performance. Gender is also a demographic variable to investigate the possible variation in self-efficacy and technology attitude.

Research Methodology
Research Design

The proposed quantitative correlational research design was used to determine the predictive relationships between the academic self-efficacy, technology attitude, and academic achievement among undergraduate students.

Participants

The population sample was composed of 404 undergraduate learners at the University of Lahore in Pakistan. The respondents were selected in six departments, including Pharmacy, Clinical Pharmacy, Physical Therapy, Education, Islamic Studies, and Nutrition and Dietetics. Among the respondents, 171 (42 percent) were male and 233 (58) were female. Most of them were pursuing middle semesters with Semester Three being the highest number.

Instruments

An adapted scale was used to measure academic self-efficacy on the basis of the instructions provided by Bandura (2006), which indicated that it had good reliability (Cronbach 2006 = 0.848). Technological attitudes were evaluated based on an instrument that was modified on the basis of Teo (2008) and whose foundation was on TAM with high reliability (Cronbachs =.923). The academic performance was measured on self-reported CGPA of students.

Data Collection and Analysis

The data were gathered using structured online questionnaires which were sent using Google Forms. The instruments were reliable and clear as tested in a pilot study. Data were analyzed using SPSS Version 27, employing descriptive statistics, Pearson correlation, independent-samples *t*-tests, and multiple regression analysis.

Results

Table 1

Gender-wise Difference of Respondents

Variable	Category	frequence	percentages
Gender	Male	171	42%
	Female	233	58%

Table 2

Semester-wise Difference of Respondents

Semester	F	Valid Percentage	%age
Sem one	21	5.2	5.2
Sem two	49	12.1	12.1
Sem three	130	32.2	32.2
Sem four	95	23.5	23.5
Sem five	76	18.8	18.8
Sem six	12	3.0	3.0
Sem seven	11	2.7	2.7
Sem eight	10	2.5	2.5
Total	404	100.0	100.0

Table 3

Difference according to Respondents' Department

Department	F	%age	Valid Percent	Cumulative Percent
Education	45	11.1	11.1	11.1
Islamic Studies	30	7.4	7.4	18.6
physical therapy	75	18.6	18.6	37.1
Pharmacy	144	35.6	35.6	72.8
clinical pharmacy	103	25.5	25.5	98.3
nutrition and diet	7	1.7	1.7	100.0
Total	404	100.0	100.0	

Research Question 1

How does the combination of self-efficacy, attitude towards technology, and academic achievement affect the undergraduate students?

Table 4

Model Summary

Model	B	SE B	β	t	Sig.
(Constant)	12.450	.980	—	12.700	.000
Sum Attitude	.215	.045	.382	4.780	.000
SumSF	.301	.052	.458	5.790	.000

Model Summary: R = .72, R² = .52, Adjusted R² = .51, Std. Error = 0.41.

Research Question 2

What is the role of attitude towards technology in determining the academic performance of the undergraduate students?

Table 5

Simple Linear Regression Analysis of Attitude Toward Technology and Academic Achievement.

Predictor	B	SE B	β	t	Sig.
Constant	128.667	4.679	—	27.498	.000
Attitudes Toward Technology	.187	.029	.308	6.500	.000

The regression model explained 9.5% of the variance in academic achievement (R = .308, R² = .095, Adjusted R² = .093)

Research Question 3

What is the extent to which self-efficacy influences academic performance of undergraduate students?

Table 6

Effect of Self-Efficacy on Academic Achievement of Undergraduate Students

Predictor	B	SE B	β	t	Sig.
Constant	3.50	.20	—	17.50	.001
Sum SF	.45	.07	-.52	6.43	.001

Research Question 4

What is the attitude to technology among the undergraduate students?

Table 7

Statements	SDA F(%)	DA F(%)	N F(%)	A F(%)	SA F(%)	M	SD
I enjoy doing things on the computer.	10(2.5)	8 (2.0)	13 (3.2)	142 (35.1)	231 (57.2)	4.4	.85
Computers give me opportunities to learn many new things	4(1.0)	9 (2.2)	21 (5.2)	208 (51.5)	162 (40.1)	4.2	.74
can learn many things when I use a computer.	28(6.9)	30 (7.4)	45 (11.1)	154 (38.1)	147 (36.4)	3.8	1.17
I think that computers are very easy to use.	17(4.2)	25 (6.2)	62 (15.3)	127 (31.4)	173 (42.8)	4.0	1.10
Am not afraid of Computers	22(5.4)	46 (11.4)	51 (12.6)	148 (36.6)	137 (33.9)	3.8	1.17
It takes time to finish an assignment while using a computer	21(5.2)	47 (11.6)	61 (15.1)	139 (34.4)	136 (33.7)	3.7	1.17
I believe that it is very important for me to learn how to use a computer.	29(7.2)	40 (9.9)	61(15.1)	148(36.6)	126(31.2)	3.7	1.20

Statements	SDA F(%)	DA F(%)	N F(%)	A F(%)	SA F(%)	M	SD
Using a computer is very frustrating	25 (6.2)	44 (10.9)	59 (14.6)	144 (35.6)	132 (32.7)	3.7	1.19
I learn from books more than computers.	19 (4.7)	29(7.2)	33 (8.2)	151 (37.4)	172 (42.6)	4.0	1.10
I have a lot of self-confidence when it comes to working with computers.	67 (16.6)	55 (13.6)	50 (12.4)	127 (31.4)	105 (26.0)	3.3	1.42
Computers will improve education.	79 (1.7)	17 (4.2)	47 (11.6)	136 (33.7)	197 (48.8)	4.23	.93
If there was a computer in my classroom it would help me to be a better teacher.	20 (5.0)	30 (7.4)	43 (10.6)	161 (39.9)	150 (37.1)	3.96	1.10
computers are used successfully	26 (6.4)	36 (8.9)	61 (15.1)	165 (40.8)	116 (28.7)	3.76	1.14
Computers can be instructional aids	28 (6.9)	31 (7.7)	52 (12.9)	160 (39.6)	133 (32.9)	3.83	1.16
Computers would increase my productivity.	24 (5.9)	30 (7.4)	42 (10.4)	153 (37.9)	155 (38.4)	3.95	1.14
More courses should use multimedia to disseminate class information and assignments	28 (6.9)	29 (7.2)	32 (7.9)	139 (34.4)	170 (42.1)	3.99	1.18
The use of multimedia increases motivation for the course.	24 (5.9)	30 (7.4)	42 (10.4)	179 (44.3)	129 (31.9)	3.888	1.11
The use of spreadsheets makes the student feel more involved	27 (6.7)	41 (10.1)	59 (14.6)	164 (40.6)	113 (28.0)	3.73	1.16
The use of word processing helps the student to learn more	19 (4.7)	29 (7.2)	3 (8.2)	151 (37.4)	172 (42.6)	3.33	.935
The use of spreadsheet helps provide a better learning experience	19 (4.7)	38 (9.4)	59 (14.6)	160 (39.6)	136 (33.7)	4.23	1.10
I can look for information online using a search engine.	35 (8.7)	28 (6.9)	79 (19.6)	155 (38.4)	107 (26.5)	3.67	1.18
I know not all online information is reliable	16 (4.0)	70 (17.30)	91 (22.5)	141 (34.9)	8 (21.3)	3.52	1.12
I can save or store files (e.g., text, pictures, music,	27 (6.7)	45 (11.1)	44 (10.9)	133 (32.9)	155 (38.4)	3.85	1.23
I can communicate with others using mobile phone, Voice over	27 (6.7)	45 (11.1)	44 (10.9)	133 (32.9)	155 (38.4)	3.89	1.20
I can share files and content using simple tools.	24 (5.9)	35 (8.7)	56 (13.9)	162 (40.1)	127 (31.4)	3.82	1.14
I know I can use digital technologies to interact with services	24 (5.9)	35 (8.7)	56 (13.9)	162 (40.1)	127 (31.4)	3.53	1.29
I am aware of social networking sites and online collaboration	24 (5.9)	35 (8.7)	56 (13.9)	162 (40.1)	127 (31.4)	3.79	1.13
I am aware that when using digital tools, certain	25 (6.2)	34 (8.4)	58 (14.4)	167 (41.3)	120 (29.7)	3.80	1.13
I can produce simple digital content	24 (5.9)	35 (8.7)	57 (14.1)	169 (41.8)	119 (29.5)	3.82	1.23
I can make basic editing to content produced by others	39 (9.7)	26 (6.4)	39 (9.7)	164 (40.6)	136 (33.7)	3.64	1.23
I know that content can be covered by copyright	27 (6.7)	45 (11.1)	44 (10.9)	133 (32.9)	155 (38.4)	3.89	1.20
I can apply and modify simple functions and settings of	24 (5.9)	35 (8.7)	56 (13.9)	162 (40.1)	127 (31.4)	3.82	1.14
I can take basic steps to protect my devices	24 (5.9)	35 (8.7)	56 (13.9)	162 (40.1)	127 (31.4)	3.53	1.29

Statements	SDA F(%)	DA F(%)	N F(%)	A F(%)	SA F(%)	M	SD
I am aware that my credentials	27 (6.7)	45 (11.1)	44 (10.9)	133 (32.9)	155 (38.4)	3.89	1.20
I know I should not reveal private information online.	7(1.7)	16 (4.0)	29(7.2)	147 (36.4)	205 (50.7)	4.30	.89
I know that using digital technology too extensively can affect	27 (6.7)	41 (10.1)	59 (14.6)	164 (40.6)	113 (28.0)	3.73	1.16
I find support when a technical problem	19 (4.7)	29 (7.2)	33 (8.2)	151 (37.4)	172 (42.6)	3.33	.935
I know how to solve some routine problems	19 (4.7)	38 (9.4)	59 (14.6)	160 (39.6)	136 (33.7)	4.23	1.10
I know that digital tools help me in solving problems	27 (6.7)	41 (10.1)	59 (14.6)	164 (40.6)	113 (28.0)	3.73	1.16
I can solve difficult problems if I try hard	25 (6.2)	45 (11.1)	66 (16.3)	154 (38.1)	114 (28.2)	3.71	1.16
It is easy for me to stick to my aims and accomplish my goals	4 (1.0)	19(4.7)	20 (5.0)	202 (50.0)	159 (39.4)	4.22	.82
I can solve most problems if I invest the necessary effort.	28 (6.9)	30 (7.4)	45 (11.1)	154 (38.1)	147 (36.4)	4.20	.85
I often succeed when I persist through difficult challenges	4 (1.0)	16 (4.0)	32 (7.9)	171 (42.3)	181 (44.8)	4.25	.84
I feel confident when I achieve a goal through my own effort	7 (1.7)	16 (4.0)	29 (7.2)	147 (36.4)	205 (50.7)	4.30	.89
I am confident that I could deal efficiently with unexpected events	6 (1.5)	25(6.2)	32 (7.9)	167 (41.3)	174 (43.1)	4.18	.92
When I succeed at a difficult task, I feel more capable overall	8 (2.0)	22(5.4)	29 (7.2)	167 (41.3)	178 (44.1)	4.20	.93
I can usually handle whatever comes my way	7 (1.7)	27 (6.7)	43 (10.6)	180 (44.6)	147 (36.4)	4.07	.94
Seeing others succeed helps me believe I can succeed too.	4 (1.0)	17 (4.2)	44 (10.9)	164 (40.6)	175 (43.3)	4.21	.87

Research Question 5

How self-efficacious are the undergraduate students?

Table 8

Statements	SDA F(%)	DA F(%)	N F(%)	A F(%)	SA F(%)	M	SD
When I see someone handle a challenge, I gain confidence	7 (1.7)	25 (6.2)	53 (13.1)	159 (39.4)	160 (39.6)	4.08	1.16
I feel more capable when I see others overcome obstacles	10 (2.5)	25 (6.2)	43 (10.6)	184 (45.5)	142 (35.1)	4.04	.82
I often learn how to solve problems by observing others	28 (6.9)	30 (7.4)	45 (11.1)	154 (38.1)	147 (36.4)	4.15	.85
seeing others overcome difficult situations gives me hope	13 (3.2)	36 (8.9)	32 (7.9)	163 (40.3)	154 (38.1)	4.01	.84
if someone believes I can do it, then i can do it	7 (1.7)	16 (4.0)	31 (7.7)	147 (36.4)	205 (50.7)	4.10	.89
Observing successful people motivates me	6 (1.5)	25 (6.2)	32 (7.9)	167 (41.3)	174 (43.1)	4.07	.92
Encouragement from others makes me believe in my abilities	8 (2.0)	22 (5.4)	29 (7.2)	167 (41.3)	178 (44.1)	4.09	.93

Statements	SDA F(%)	DA F(%)	N F(%)	A F(%)	SA F(%)	M	SD
I feel more capable when people express confidence in me	7(1.7)	27(6.7)	43(10.6)	180 (44.6)	147 (36.4)	3.92	.94
When someone believes in me, I perform better	2(.5)	33(8.2)	31(7.7)	163 (40.3)	175 (43.3)	4.17	0.92
Support from friends and family increases my motivation	7 (1.7)	26 (6.4)	49 (12.1)	156 (38.6)	166 (41.1)	4.10	0.96
I try harder when people expect me to succeed	26 (6.4)	36 (8.9)	61 (15.1)	165 (40.8)	116 (28.7)	3.76	1.14
Having access to financial resources gives me a sense of control	28 (6.9)	31 (7.7)	52 (12.9)	160 (39.6)	133 (32.9)	3.83	1.16
Economic stability helps me focus better on achieving goals	24 (5.9)	30 (7.4)	42 (10.4)	153 (37.9)	155 (38.4)	3.95	1.14
I can remain calm when facing difficulties because I can rely on my coping abilities	28 (6.9)	29 (7.2)	32 (7.9)	139 (34.4)	170 (42.1)	3.99	1.18
I often stay emotionally balanced in high-stress situations	7 (1.7)	16 (4.0)	31 (7.7)	147 (36.4)	205 (50.7)	4.10	.89
I don't let nervousness prevent me from taking action.	6 (1.5)	25 (6.2)	32 (7.9)	167 (41.3)	174 (43.1)	4.07	.92
I feel physically capable of handling pressure	28 (6.9)	30 (7.4)	45 (11.1)	154 (38.1)	147 (36.4)	4.20	.85
I recover quickly after experiencing emotional stress	4 (1.0)	16 (4.0)	3 2(7.9)	171 (42.3)	181 (44.8)	4.25	.84
When I'm anxious, I use strategies to regain focus	7 (1.7)	16 (4.0)	29 (7.2)	147 (36.4)	205 (50.7)	4.30	.89
I trust my emotions to guide me through difficult tasks.	6 (1.5)	25 (6.2)	32 (7.9)	167 (41.3)	174 (43.1)	4.18	.92
I believe my natural traits help me adapt to challenges	29 (7.2)	40 (9.9)	61 (15.1)	148 (36.6)	126 (31.2)	3.7	1.20
I have always had a strong inner drive to succeed	25 (6.2)	44 (10.9)	59 (14.6)	144 (35.6)	132 (32.7)	3.7	1.19
Being resilient feels like a part of who I am	24 (5.9)	30 (7.4)	42(10.4)	153 (37.9)	155 (38.4)	3.95	1.14
I think confidence is partly something I was born with	28 (6.9)	29 (7.2)	32 (7.9)	139 (34.4)	170 (42.1)	3.99	1.18
I often rely on my personality traits when facing adversity	29 (7.2)	40(9.9)	61 (15.1)	148 (36.6)	126 (31.2)	3.7	1.20
My background has influenced how confident I feel about my abilities.	25 (6.2)	44 (10.9)	59 (14.6)	144 (35.6)	132 (32.7)	3.7	1.19
I have access to opportunities that help me succeed.	19 (4.7)	29 (7.2)	33 (8.2)	151 (37.4)	172 (42.6)	4.0	1.10
My environment gives me the tools I need to solve problems	29 (7.2)	40 (9.9)	61 (15.1)	148 (36.6)	126 (31.2)	3.7	1.20
I feel more self-assured because of the education and support available to me	7 (1.7)	16 (4.0)	29 (7.2)	147 (36.4)	205 (50.7)	4.30	.89

Research Question 6

Do the undergraduate students differ in their self-efficacy and attitude towards the use of technology significantly, depending on gender, semester, and degree program?

Table 9

Difference in Attitude toward Technology and Self-Efficacy by Gender among Undergraduate Students

Variable	Gender	N	Mean	SD	t	df	Sig.
Attitude towards Technology	Male	171	145.20	24.10			
	Female	233	170.85	20.30	-6.85	402	.000
Self-Efficacy	Male	171	150.40	14.80			
	Female	233	165.90	13.20	-5.12	402	.000

Discussion

The results of the current research have a solid empirical evidence of the central position of academic self-efficacy and technology attitude in determining academic achievement among undergraduate students. In line with Self-Efficacy Theory postulated by Bandura, students who held on to their academic potentials had better academic performance and this underscores the motivational and self-regulative roles of self-efficacy.

Technological attitudes were also found to be a strong predictor and they confirm the assumptions of TAM. Students who viewed technology as helpful and easy to handle had higher chances to use digital learning materials and improve their academic performance. Despite the greater predictive power of self-efficacy, technology attitudes had significant additional predictive value in that psychological preparedness is important in technology-enriched learning conditions.

The identified gender variation implies that female students in the present case can prove to be more adaptive and involved in academic technologies, yet additional studies are required to understand the underlying factors.

In general, the results can indicate that efficient technology integration should be supported by the strategies that boost student confidence and positive beliefs about learning.

Conclusion

This paper confirms that academic self-efficacy and technological attitude of undergraduate students are major predictors of academic performance. Combined, the variables account more than 50 percent of the academic performance variance and this indicates the significance of psychological variables in contemporary higher education. The strongest predictor was found to be academic self-efficacy with technology attitudes also having a secondary impact.

Recommendations

Universities need to introduce the interventions that empower students in regard to academic confidence and digital competency. A supportive teaching practice needs to be highlighted in the faculty development program to enhance a self-efficacy and positive views of technology. In future studies, longitudinal and mixed-method design will be implemented to study the development of these psychological constructs.

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