ISSN (ELECTRONIC): 2945-3135

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH & REVIEWS

journal homepage: www.ijmrr.online/index.php/home

ICT SELF-CONCEPT, ATTITUDE, AND COMPETENCY: A DESCRIPTIVE INQUIRY INTO STUDENT DIGITAL READINESS AND ACADEMIC PERFORMANCE

Dr. Pradeep Kumar

Assistant Professor (Education), Maulana Azad National Urdu University, Hyderabad, T.S., India
kumar2pradeep@gmail.com

How to Cite the Article: Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

https://doi.org/10.56815/ijmrr.v5i8.2026.228-243

Keywords	***Abstract***
ICT Self-Concept, Digital Competency, Academic Achievement, Higher Education.	Digital readiness has become a central benchmark for scholarly productivity in modern higher education settings. While higher education institutions continue to expand their technical systems, a student's success relies heavily on personal self-efficacy, positive technical attitude, and practical operational skills. This empirical study examines how three core elements of digital readiness—Information and Communication Technology (ICT) self-concept, attitude toward ICT, and functional ICT competency—predict academic performance of postgraduates. Using a quantitative predictive survey design, data were gathered from 200 postgraduate students from two major Indian central universities (Maulana Azad National Urdu University and Aligarh Muslim University) through validated instruments. Multiple regression modeling indicated that the three readiness variables collectively accounted for 48.0% of the variance in CGPA ($R^2 = .480$, $F_{3,196} = 59.21$, $p < .001$). ICT competency emerged as the primary unique contributor ($\beta = .460, p < .001$), followed by ICT self-concept ($\beta = .320, p = .001$) and attitude ($\beta = .210, p = .003$). Institutional comparisons revealed minor variations in technical skill and self-concept,

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

	whereas positive attitudinal orientations were uniform. These findings highlight that while supportive attitudes create necessary engagement, functional skills and ICT self-belief are the main drivers of advanced academic success.

1. Introduction:

The integration of digital technologies has thoroughly transformed university education today, moving academic workflows into web-based learning management systems (LMS), open-access citation indexes, collaborative learning portals, and specialized computational software. For postgraduate scholars, navigating these tools is not optional; but is fundamental to carry out empirical literature syntheses, running statistical tests, collaborating across learning networks, and drafting manuscripts.

However, the physical availability of devices and high-speed internet does not guarantee academic excellence. A clear divide remains between simply possessing hardware and applying it effectively toward complex scholarly objectives. Digital readiness involves both operational competence and internal psychological alignment. When students possess digital tools but doubt their personal ability or undervalue technological utility, their engagement remains minimal.

According to Bandura's (1997) Social Cognitive Theory, the personal self-efficacy directly shapes cognitive effort, persistence, and problem-solving behaviours. In academic computing, ICT self-concept—a student's internal motivation of their ability to handle digital interfaces—moderates frustration and drives persistence. In conrast, Technology Acceptance Model (TAM) of Davis's (1989) indicates that perceived ease of use and perceived usefulness govern user willingness to adopt educational software. Alongside these affective dimensions, the Digital Competence Framework (DigComp; Carretero et al., 2017; Van Laar et al., 2020) stresses that technical, evaluative, and information-handling skills are critical in academic settings.

Much of the existing literature evaluates these dimensions independently. Prior investigations have typically focused either on general student ICT attitudes (e.g., Mensah et al., 2023) or on isolated functional abilities (e.g., Lucas et al., 2021), rarely synthesizing ICT self beliefs, affective dispositions, and operational competency within a single predictive structure. Furthermore, research has predominantly focused on primary, secondary, or undergraduate learners, leaving postgraduate cohorts underexamined despite their heavy needs and demands of ICT usage in academics. This study fills these empirical gaps by examining how ICT self-concept, attitude toward ICT, and ICT practical competency jointly predict academic achievement (CGPA) among master's students at Maulana Azad National Urdu University (MANUU) and Aligarh Muslim University (AMU).

2. Theoretical Framework and Hypotheses Development:

2.1 Theoretical Framework

This study synthesizes three complementary theoretical models: Social Cognitive Theory (Bandura, 1997), the Technology Acceptance Model (Davis, 1989), and the Digital Competence Framework (Van Laar et al., 2020).

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

Social Cognitive Theory posits that human performance is driven by interactions between cognitive traits, environmental contexts, and behavioural choices. In this study, ICT self-concept represents the personal cognitive domain. Students who consider themselves technologically capable approach academic problems with resilience and proactively resolve interface errors. The Technology Acceptance Model explains user motivation, positing that behavioural intention to adopt technology is driven by its perceived utility and ease of operation. In universities, a positive orientation toward ICT indicates that a learner views digital technology as a helpful instrument for literature synthesis and academic activities and collaboration.

The Digital Competence Framework ICT covers operational capabilities, such as information filtering, data synthesis, problem solving, and secure communication. At the postgraduate level, these abilities enable the execution of demanding academic projects. Together, these theories illustrate that academic success demands confidence (ICT self-concept), willingness (attitude towards ICT), and technical execution (ICT competency).

2.2 ICT Self-Concept and Academic Performance

ICT self-concept refers to an individual's evaluation of their capacity to execute tasks across digital environments. Unlike general academic self-efficacy, ICT self-concept is domain-specific, reflecting an individual's confidence while operating academic tasks, analytical software, and digital communication tools. Learners with higher technological self-efficacy exhibit greater perseverance and lower cognitive strain when navigating complex technology interfaces (Chiu et al., 2021; Hatlevik et al., 2018). When facing software errors or intricate data tools, confident students persist rather than abandon the task (Li et al., 2022). To examine whether ICT self-beliefs directly predict academic success among postgraduate scholars, the following hypothesis is formulated:

> **H1:** *ICT self-concept significantly and positively predicts postgraduate academic achievement.*

2.3 Attitude Toward ICT and Academic Performance

Attitude toward ICT captures a learner's general disposition toward educational technology. Under TAM (Davis, 1989), positive attitudes develop when learning technology platforms are perceived as effective and user-friendly. Students with positive attitudes are more likely to integrate virtual repositories, learning portals, and collaborative software into daily study routines (Mensah et al., 2023; Scherer et al., 2019). This positive attitude fosters proactive learning habits and deeper engagement in learners with digital libraries and scholarly tools (Tang et al., 2022). To evaluate the predictive influence of affective and motivational dispositions on postgraduate academic achievement, the following hypothesis is framed:

> **H2:** *Attitude toward ICT significantly and positively predicts postgraduate academic achievement*

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

2.4 ICT Competency and Academic Performance

ICT competency denotes practical skill in discovering, assessing, producing, and communicating digital content within academic settings (Carretero et al., 2017). Postgraduate programs have significant emphasis on independent research, requiring PG students to retrieve indexed literature, operate reference managers, use statistical models, and build digital presentations. Deficits in these foundational competencies introduce operational friction, diverting attitude away from core analysis (Claro et al., 2012; Lucas et al., 2021). Conversely, high technical proficiency allows scholars to complete analytical work efficiently and allocate more focus to higher-order conceptual synthesis (Hatlevik & Christophersen, 2013). To establish the operational contribution of ICT functional skill execution on student outcomes, the following hypothesis is proposed:

> **H3:** *ICT competency significantly and positively predicts postgraduate academic achievement.*

2.5 The Combined Effect of Digital Readiness Dimensions

Digital readiness is an integrated system where ICT self-confidence, positive attitudes towards ICT, and ICT practical competencies reinforce one another (Adedoyin & Soykan, 2023; Zakir et al., 2025). Favourable attitudes towards ICT foster initial interest, ICT self-concept provides the resilience to withstand software difficulties, and functional competence, to ensures accurate task execution. Investigating these three components together offers a comprehensive view of how digital proficiency drives postgraduate academic success.

To test whether the combination of ICT self-concept, affective attitude towards ICT, and functional ICT competency creates an explanatory model for student achievement, the following hypothesis is advanced:

> **H4**: *ICT self-concept, attitude toward ICT, and ICT competency jointly predict a significant proportion of variance in postgraduate academic achievement.*

3. Methodology:

We used a quantitative, cross-sectional predictive survey design for this study.

3.1 Research Design and Sample

The present study utilized a quantitative, cross-sectional descriptive survey design. The target population comprised postgraduate (Master's level) students across diverse disciplines (Humanities, Social Sciences, Natural Sciences, Education, and Management) studying at two Indian central universities: Maulana Azad National Urdu University (MANUU, Hyderabad) and Aligarh Muslim University (AMU, Aligarh). These institutions provide an ideal context for this study due to their diverse student populations, and established digital learning infrastructures.

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

A non-probability purposive sampling strategy was employed to gather data from students actively using technology-enhanced learning tools. A total of 240 questionnaires were administered (120 per institution). Surveys were administered through paper-based questionnaires.

Initial Survey Distribution (N = 240)

├── Maulana Azad National Urdu University (n = 120)

└── Aligarh Muslim University (n = 120)

|

▼

Data Screening & Quality Audit (n = 40 excluded)

├── Incomplete submissions (>5% missing data; n = 14)

├── Systematic unengaged responding / Straight-lining (n = 18)

└── Univariate/Multivariate Outliers (Mahalanobis D^2; n = 8)

|

▼

Final Valid Analytical Sample (N = 200)

├── MANUU (n = 100; 50.0%)

└── AMU (n = 100; 50.0%)

Following the data collection, the dataset underwent systematic data cleaning. Submissions with more than 5% missing values ($n = 14$), straight-line responses exhibiting zero variance across reverse-coded items ($n = 18$), and multivariate outliers, identified via Mahalanobis distance at $p < .001$ ($n = 8$) were removed. The final dataset contained 200 fully complete, valid responses ($N = 200$; 100 from MANUU and 100 from AMU), representing an effective response rate of 83.33%.

A post-hoc statistical power analysis conducted via G*Power 3.1 confirmed that for a multiple regression model with three predictors, an observed $R^2 = .480$, an alpha level of $\alpha = .05$, and a sample size of $N = 200$, the achieved statistical power exceeded $1 - \beta = .99$, well above the standard .80 threshold (Faul et al., 2009; Tabachnick & Fidell, 2013).

3.2 Instrumentation

Data were collected using standardized, psychometrically validated instruments adapted to higher education contexts. All digital readiness items were scored on a 5-point Likert scale ranging from 1

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

("Strongly Disagree") to 5 ("Strongly Agree").

- **ICT Self-Concept:** Evaluated using the 22-item ICT Self-Concept Scale (ICTSCS-GM) by Dr. Manmohan Gupta, which measures personal confidence in managing software, resolving digital hurdles, and learning new tools.
- **Attitude toward ICT:** Measured via the 30-item ICT Attitude Scale (ICTAS-GM) by Dr. Manmohan Gupta, evaluating perceived ease of use, utility, and affective views on technology.
- **ICT Competency:** Assessed using the 28-item ICT Competency Scale (ICTCS-GM) by Dr. Manmohan Gupta, capturing operational proficiency across database queries, statistical software, digital communication, and reference handling.
- **Academic Achievement:** Academic achievement was measured as cumulative grade point average (CGPA) on a 10.0-point continuous scale, obtained as self-reported data from the participants.

3.3 Analytical Procedures

Data were analysed using IBM SPSS Statistics (v27.0). Central tendencies, internal consistencies (Cronbach's α, McDonald's ω), and distribution normality were measured. Bivariate relationships were computed, using Pearson's product-moment correlation coefficient (r). Multiple linear regression was determined the collective explanatory power (R^2), and unique predictive contributions (β) of the readiness dimensions on CGPA. Independent-samples t-tests and Cohen's d evaluated differences across institutional cohorts.

4. Empirical Results:

4.1 Descriptive Analysis and Scale Reliability

Descriptive statistics, internal consistency coefficients, and distribution metrics for the study variables ($N = 200$) are summarized in the following table no. 1.

Table 1: Descriptive Statistics, Reliability Metrics, and Distribution Parameters

Variable	Items	Mean (M)	Std. Dev. (SD)	Cronbach's α	McDonald's ω	Skewness	Kurtosis
1. ICT Self-Concept	22	3.72	0.54	.84	.85	-0.31	-0.19
2. Attitude	30	3.85	0.49	.82	.83	-0.24	-0.38

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

toward ICT							
3. ICT Competency	28	3.91	0.52	.89	.89	-0.42	+0.26
4. Academic Achievement (CGPA)	Continuous	7.84	0.68	—	—	-0.18	-0.11

Note: Readiness scales range from 1.00 to 5.00; Academic Achievement ranges from 0.00 to 10.00.

Participants exhibited moderately high scores across all readiness dimensions, led by ICT competency ($M = 3.91, SD = 0.52$), followed by attitude towards ICT ($M = 3.85, SD = 0.49$) and ICT self-concept ($M = 3.72, SD = 0.54$). Mean academic achievement was found 7.84 ($SD = 0.68$). All instruments demonstrated high internal reliability ($\alpha \geq .82, \omega \geq .83$) and acceptable distributional symmetry.

4.2 Bivariate Correlations

To examine the direct linear associations between individual digital readiness constructs and the academic performance, Pearson correlation coefficients were calculated. The zero-order bivariate correlations across all continuous predictors and the criterion variable are presented in the table 2.

Table 2: Inter-Construct Correlation Matrix ($N = 200$)

Variable	1	2	3	4
1. ICT Self-Concept	1.000	—	—	—
2. Attitude toward ICT	.412**	1.000	—	—
3. ICT Competency	.534**	.461**	1.000	—
4. Academic Achievement (CGPA)	.441**	.363**	.582**	1.000

$p < .01$ *(two-tailed).*

All digital readiness dimensions showed statistically significant positive correlations with the academic achievement. ICT competency exhibited the strongest relationship with CGPA ($r = .582, p < .001$), representing a strong positive association. ICT self-concept demonstrated a moderate positive relationship with the academic achievement ($r = .441, p < .001$), as did attitude toward ICT ($r = .363, p < .001$).

All the predictors showed positive, moderate relationships (r = .412) to (r= .534), meaning they overlap slightly while measuring separate concepts without causing major redundancy issues.

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

4.3 Regression Modelling

To test hypotheses H1, H2, H3, and H4, a multiple linear regression analysis was conducted with ICT self-concept, attitude toward ICT, and ICT competency entered simultaneously as predictors of academic achievement. Diagnostic checks confirmed the absence of multicollinearity (all Tolerance values $> .65$, all Variance Inflation Factors [VIF] < 1.55), and independence of errors was verified via the Durbin-Watson statistic ($d = 1.912$, close to the optimal value of 2.0).

The overall model summary for the multiple linear regression equation predicting postgraduate academic achievement is detailed in the following table no. 3.

Table 3: Multiple Linear Regression Model Summary for Academic Achievement ($N = 200$)

Model	R	R2	Adjusted R2	Std. Error	F-Ratio (df1,df2)	Sig. (p)	Durbin-Watson
1	.693	.480	.472	0.494	$59.21(3,196)$	$< .001$	1.912

Predictors: (Constant), ICT Self-Concept, Attitude toward ICT, ICT Competency. Dependent Variable: Academic Achievement (CGPA).

The overall regression model was found statistically significant ($F_{3,196} = 59.21, p < .001$), accounting for 48.0% of the variance in postgraduate academic achievement ($R^2 = .480$, Adjusted $R^2 = .472$). This demonstrates strong explanatory power within educational research and supports the hypothesis H4.

To examine the individual predictive contribution and relative weightage of each digital readiness dimension within the regression equation, individual parameter estimates were computed. The unstandardized coefficients, standardized coefficients, t-statistics, significance levels, and the collinearity diagnostics are reported in the table no. 4 below.

Table 4: Regression Coefficients and Multicollinearity Diagnostics ($N = 200$)

Parameter	B	SE	β	t-value	Sig. (p)	95% CI for B	Tolerance	VIF
(Constant)	2.142	0.418	—	5.124	$< .001$	[1.318, 2.966]	—	—
ICT Self-Concept	0.403	0.083	.320	4.880	.001	[0.240, 0.566]	0.682	1.466
Attitude toward	0.292	0.097	.210	3.021	.003	[0.101,	0.748	1.337

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

ICT						0.483]		
ICT Competency	0.602	0.089	.460	6.742	$< .001$	[0.426, 0.778]	0.658	1.520

Standardized beta coefficients showed that all the three variables contributed significantly to the model. ICT competency was the strongest predictor of academic achievement ($\beta = .460, t = 6.742, p < .001$), supporting the H3. ICT self-concept was the second strongest predictor ($\beta = .320, t = 4.880, p = .001$), supporting the H1. Attitude toward ICT was also a significant, positive predictor ($\beta = .210, t = 3.021, p = .003$), which supported H2.

4.4 Comparative Institutional Analysis

To evaluate whether institutional environments influence digital readiness, independent-samples t-tests were conducted comparing students from MANUU ($n = 100$) and AMU ($n = 100$).

The comparative group metrics, mean differences, t-values, and Cohen's d effect sizes across both central universities are presented in given table no. 5.

Table 5: Institutional Comparison Between MANUU and AMU ($df = 198$)

Variable	MANUU Mean (SD)	AMU Mean (SD)	Mean Diff.	t-statistic	Sig. (p)	Cohen's d
ICT Self-Concept	3.65 (0.52)	3.79 (0.55)	-0.14	2.12	.035	0.26
Attitude toward ICT	3.80 (0.51)	3.90 (0.47)	-0.10	1.88	.062	0.20
ICT Competency	3.85 (0.53)	3.97 (0.50)	-0.12	2.41	.017	0.23
Academic Achievement	7.78 (0.69)	7.90 (0.67)	-0.12	1.25	.213	0.18

AMU students scored slightly higher in ICT self-concept ($M = 3.79, SD = 0.55$) than MANUU students ($M = 3.65, SD = 0.52$; $t_{198} = 2.12, p = .035, d = 0.26$). AMU students also scored higher in ICT competency ($M = 3.97, SD = 0.50$) compared to MANUU students ($M = 3.85, SD = 0.53$; $t_{198} = 2.41, p = .017, d = 0.23$). These differences reflect small-to-moderate effect sizes. In contrast, differences in attitude toward ICT ($t_{198} = 1.88, p = .062$) and overall academic achievement ($t_{198} = 1.25, p = .213$) were not statistically significant.

4.5 Summary of Hypothesis Testing

The outcomes of the empirical tests corresponding to the research hypotheses formulated in Section 2 are systematically synthesized in the table no. 6.

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance**.** International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

Table 6: Summary of Hypotheses Testing Decisions

Hypothesis Statement	Key Empirical Metric	Significance (p)	Decision
H1: ICT self-concept significantly predicts academic achievement.	$\beta = .320, t = 4.880$	$p = .001$	Supported
H2: Attitude toward ICT significantly predicts academic achievement.	$\beta = .210, t = 3.021$	$p = .003$	Supported
H3: ICT competency significantly predicts academic achievement.	$\beta = .460, t = 6.742$	$p < .001$	Supported
H4: ICT self-concept, attitude, and competency jointly predict achievement.	$R^2 = .480, F = 59.21$	$p < .001$	Supported

5. Discussion:

The empirical findings support the conceptual framework of the study, confirming that digital readiness functions as a multidimensional predictor of the academic achievement among postgraduate learners. The regression model accounted for 48.0% of the variance in student CGPA ($R^2 = .480, p < .001$). This aligns with the modern educational theories which indicate that learning outcomes in digitalized environments depend on both functional & technical abilities and psychological orientations of the learners (Adedoyin & Soykan, 2023; Van Laar et al., 2020).

5.1 The Primary Predictive Role of ICT Competency

ICT competency emerged as the most powerful predictor of postgraduate learner's academic performance ($\beta = .460, p < .001$). This dominant influence reflects the research demands of the postgraduate curricula. Unlike undergraduate coursework, which often focuses on content learning, postgraduate programs require independent literature synthesis, research design execution, statistical computing, reference management, digital communication and scholarly manuscript preparation etc.

These findings are consistent with empirical works of Claro et al. (2012) and Lucas et al. (2021), which established that functional digital skills are critical for navigating academic workflows. Students who master digital search strategies, citation tools, and data analysis software, complete technical tasks more quickly and accurately, allowing them to focus greater cognitive effort on the higher-order analysis and synthesis (Karakose et al., 2022; Kong et al., 2021). ICT practical competency converts technological access into tangible academic performance.

5.2 Psychological Enablers: ICT Self-Concept and Attitude

ICT self-concept emerged as the second strongest predictor of the academic achievement ($\beta = .320, p = .001$). This confirms Bandura's (1997) Social Cognitive Theory, which states that personal self-efficacy beliefs govern task persistence, emotional regulation, and cognitive engagement. In digital environments, confident students approach unfamiliar interfaces, complex

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

software, and virtual research platforms with greater curiosity and resilience (Chiu et al., 2021; Hatlevik et al., 2018; Rohatgi et al., 2016). While encountering technical issues, high-efficacy learners exhibit adaptive problem-solving, rather than task avoidance (Li et al., 2022).

Attitude toward ICT also had a statistically significant, positive predictive effect ($\beta = .210, p = .003$), supporting the Technology Acceptance Model of Davis (1989). A positive attitude towards ICT encourages initial and continued engagement with digital tools among the users (Mensah et al., 2023; Scherer et al., 2019). However, ICT attitude had the lowest standardized beta coefficient ($\beta = .210$) among the three predictors. This indicates that while positive attitudes towards ICT encourage technology use, they cannot substitute for ICT functional skills or ICT self-confidence. A student may recognize the value of digital learning tools, but without the operational ability and confidence to use them effectively, positive attitudes alone will not produce high academic achievement.

5.3 Institutional Patterns and Technological Uniformity

The comparative analysis revealed a small but statistically significant differences between the institutions in ICT self-concept ($d = 0.26$) and ICT competency ($d = 0.23$), with AMU students scoring slightly higher on both measures. These differences likely reflect variations in the institutional digital infrastructure, campus network access, and faculty integration of educational technologies into coursework.

In contrast, attitudes toward ICT did not differ significantly between the 2 institutions ($p = .062$), remaining positive across both the cohorts ($M = 3.80$ vs. $M = 3.90$). This uniformity suggests that positive attitudes toward technology have become widespread among the modern postgraduate students, driven by a broader societal exposure to smartphones, mobile computing, and open educational resources (OER). Consequently, institutional differences are more likely to appear in ICT technical competencies and ICT self-efficacy—areas that depend heavily on the direct institutional training, digital facilities, and structured practice.

6. Implications and Recommendations:

6.1 Theoretical Implications of the study

This study contributes to the educational technology literature by validating an integrated model that unites Social Cognitive Theory (Bandura, 1997), the Technology Acceptance Model (Davis, 1989), and the Digital Competence Framework (Van Laar et al., 2020). Previous research has frequently examined these theories independently. This study demonstrates that they serve as complementary components of an overall digital readiness construct:

- TAM explains the initial affective and motivational intention to use digital tools based on perceived utility.

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance**.** International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

- Social Cognitive Theory accounts for the psychological resilience, persistence, and self-belief required during digital learning.
- Digital Competence Frameworks explain the functional capabilities needed to execute complex academic and research tasks.

Demonstrating that ICT competency provides the largest unique contribution ($\beta = .460$) refines digital readiness theory, showing that while affective orientations are necessary foundations, operational and evaluative competencies are the primary direct drivers of academic achievement in higher education.

6.2 Practical and Policy Applications

These empirical findings of the study offer actionable insights for the university administrators, academic deans, and higher education policymakers as following:

- **Curricular Integration of Advanced Digital Competencies:** Basic computer orientation courses are insufficient for postgraduate scholars. Universities must embed discipline-specific digital research skills into the core curricula, including advanced academic database navigation, automated reference management, open-source data analytics, and digital research ethics.
- **Fostering Technological Self-Efficacy:** Faculty should design scaffolded, low-stakes digital learning activities that allow students to develop positive attitude towards ICT. Creating low-anxiety digital learning environments, with readily accessible technical support can help to strengthen student ICT self-concept.
- **Alignment with National Policy Frameworks:** In the context of India's National Education Policy (NEP 2020), which emphasizes digital integration and blended learning architectures, institutional funding should prioritize both hardware procurement and structured digital literacy training for the students and faculty.
- **Institutional Equity and Digital Support:** Modest institutional differences in competency highlight the need for targeted support programs at the universities modernizing their digital infrastructure. Equitable access to the digital research labs and software licenses ensures that all students have equal opportunities to build digital readiness.

7. Limitations and Future Research Directions

Several limitations should be considered when interpreting the results of this study:

- **Sampling and Generalizability:** The sample was drawn from postgraduate students at two Indian central universities using a purposive sampling strategy ($N = 200$). While adequate for regression modeling, future research should use stratified random sampling across state, private, and distance-learning institutions to enhance the generalizability.

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance**.** International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

- **Cross-Sectional Design of the study:** The cross-sectional design captures relationships among the variables at a single point in time, precluding direct causal claims. Longitudinal or experimental designs should be used in future research to trace how digital readiness dimensions develop over the course of a degree program.
- **Single Performance Metric:** Academic achievement was measured using Cumulative Grade Point Average (CGPA). Although objective and verifiable, CGPA reflects a broad composite score. Future research should evaluate specialized outcomes, such as research output, peer-reviewed publications, thesis quality, and computational problem-solving performance.
- **Emerging Technologies:** The survey instruments focused primarily on traditional ICT systems (LMS, academic databases, analytical software). Future studies should expand these frameworks to examine emerging generative AI tools, adaptive learning systems, and immersive educational environments.

8. Conclusion:

This study provides empirical evidence that the digital readiness—encompassing ICT self-concept, attitude toward ICT, and practical ICT competency—is a powerful multidimensional predictor of the academic achievement among postgraduate students, explaining 48% of the variance in CGPA ($R^2 = .480$). Although positive attitudes provide a necessary foundation for technology adoption, functional ICT competency serves as the primary operational driver of postgraduate academic success, with ICT self-concept acting as a vital psychological enabler.

Higher education institutions must look beyond the basic infrastructural access and adopt holistic digital development strategies. Universities can better prepare postgraduate students for academic success and the demands of the modern knowledge economy, by embedding structured digital competence training into curricula, designing learning environments that build technological self-efficacy, and providing equitable digital learning opportunities.

Acknowledgement: This study received financial support in the form of a minor project grant from Maulana Azad National Urdu University (MANUU).

AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body that provides financial or non-financial assistance for the topics or resources covered in this manuscript.

CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

PLAGIARISM POLICY

All authors declare that any kind of violation of plagiarism, copyright and ethical matters will take care by all authors. Journal and editors are not liable for aforesaid matters.

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

SOURCES OF FUNDING

The authors received financial support for the research in form of a minor research project grant from Maulana Azad National Urdu University.

REFERENCES

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: Challenges and opportunities. *Interactive Learning Environments*, 31(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*, 1, Article 100011. https://doi.org/10.1016/j.ijedro.2020.100011

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.

Carretero, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use* (EUR 28558 EN). Publications Office of the European Union. https://doi.org/10.2760/38842

Chiu, T. K. F., Lin, T. J., & Lonka, K. (2021). Motivating online learning: The challenges of COVID-19 and beyond. *The Asia-Pacific Education Researcher*, 30(3), 187–190. https://doi.org/10.1007/s40299-021-00566-w

Claro, M., Preiss, D. D., San Martín, E., Jara, I., Hinostroza, J. E., Valenzuela, S., Cortés, F., & Nussbaum, M. (2012). Assessment of 21st century ICT skills in Chile: Test design and results from high school level students. *Computers & Education*, 59(3), 1042–1052. https://doi.org/10.1016/j.compedu.2012.04.004

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. https://doi.org/10.2307/249008

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.

Hatlevik, O. E., & Christophersen, K.-A. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & Education*, 63, 240–247. https://doi.org/10.1016/j.compedu.2012.11.015

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

Hatlevik, O. E., Throndsen, I., Loi, M., & Gudmundsdottir, G. B. (2018). Students' ICT self-efficacy and computer and information literacy: Determinants and relationships. *Computers & Education*, 118, 107–119. https://doi.org/10.1016/j.compedu.2017.11.011

Karakose, T., Kocabas, I., Yirci, R., Papadakis, S., Ozdemir, T. Y., & Demirkol, M. (2022). The development and evolution of digital leadership: A bibliometric mapping approach-based study. *Sustainability*, 14(23), Article 16171. https://doi.org/10.3390/su142316171

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Kong, S.-C., Looi, C.-K., Huang, R., & Liu, D. (2021). Digital literacy and 21st century education. *Educational Technology Research and Development*, 69(1), 1–4. https://doi.org/10.1007/s11423-021-09951-6

Li, J., Huang, X., Lei, X., Wen, J., & Lu, M. (2022). ICT literacy, resilience and online learning self-efficacy between Chinese rural and urban primary school students. *Frontiers in Psychology*, 13, Article 1051803. https://doi.org/10.3389/fpsyg.2022.1051803

Lucas, M., Bem-Haja, P., Siddiq, F., Moreira, A., & Redecker, C. (2021). The relation between in-service teachers' digital competence and personal and contextual factors: What matters most? *Computers & Education*, 160, Article 104052. https://doi.org/10.1016/j.compedu.2020.104052

Mensah, I. K., Zeng, G., & Luo, C. (2023). Assessing the factors influencing the adoption of digital learning platforms in higher education. *Interactive Learning Environments*, 31(8), 5123–5138. https://doi.org/10.1080/10494820.2021.1993963

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, 59(3), 1065–1078. https://doi.org/10.1016/j.compedu.2012.04.016

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

Rohatgi, A., Scherer, R., & Hatlevik, O. E. (2016). The role of ICT self-efficacy for students' ICT use and their achievement in a computer and information literacy test. *Computers & Education*, 102, 103–116. https://doi.org/10.1016/j.compedu.2016.08.001

Salloum, S. A., Al-Emran, M., Habes, M., Alghizzawi, M., Ghani, M. A., & Shaalan, K. (2021). What impacts the acceptance of e-learning through social media? An empirical study. In M. Al-Emran & K. Shaalan (Eds.), *Recent advances in technology acceptance models and theories* (pp. 419–431). Springer. https://doi.org/10.1007/978-3-030-64987-6_24

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The Technology Acceptance Model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, 128, 13–35.https://doi.org/10.1016/j.compedu.2018.09.009

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License

Pradeep Kumar (2026). ICT Self-Concept, Attitude, and Competency: A Descriptive Inquiry into Student Digital Readiness and Academic Performance. International Journal of Multidisciplinary Research & Reviews, 5(8),228-243.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Tang, Y. M., Chau, K. Y., Kwok, A. P. K., Zhu, T., & Ma, X. (2022). A systematic review of immersive technology in learning and education. *Educational Research Review*, 35, Article 100424. https://doi.org/10.1016/j.edurev.2021.100424

Tang, Y. M., Chen, P. C., Law, K. M. Y., Wu, C. H., Lau, Y.-Y., Guan, J., & Ho, G. T. S. (2021). Comparative analysis of student's live online learning readiness during the coronavirus (COVID-19) pandemic in the higher education sector. *Computers & Education*, 168, Article 104211. https://doi.org/10.1016/j.compedu.2021.104211

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2020). Measuring the levels of 21st-century digital skills among professionals working within the creative industries: A performance-based approach. *Poetics*, 81, Article 101434. https://doi.org/10.1016/j.poetic.2020.101434

Zakir, S., Hoque, M. E., Susanto, P., Nisaa, V., Alam, M. K., Khatimah, H., & Mulyani, E. (2025). Digital literacy and academic performance: The mediating roles of digital informal learning, self-efficacy, and students' digital competence. *Frontiers in Education*, 10, Article 1590274. https://doi.org/10.3389/feduc.2025.1590274

The work is licensed under a Creative Commons Attribution Non Commercia 4.0 International License